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# The role of clusters in smart specialisation *strategies*

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# **The role of clusters in smart specialisation strategies**

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The report is authored by and presents the expert opinions of the following members of the group, based on academic, policy-related, and empirical work on clusters and smart specialisation strategies in a European context: Christian Ketels, Chairman (Harvard Business School and Stockholm School of Economics); Claire Nauwelaers, Rapporteur (independent expert in science, technology and innovation policy); Jennifer Cassingena Harper (Consultant, Malta Council for Science and Technology); Göran Lindqvist (Stockholm School of Economics); Beata Lubicka (Wroclaw Center for Technology Transfer); Frank Peck (University of Cumbria).

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The report reflects the position of the expert group and not that of the European Commission.

## **EXECUTIVE SUMMARY**

This report investigates the potential contribution of clusters and cluster policies in the design and implementation of Smart Specialisation Strategies. Both cluster policies and Smart Specialisation Strategies are policy approaches with a place-based dimension, aiming at exploiting advantages of proximity to promote economic growth and competitiveness. With regions across Europe currently working on their Smart Specialisation Strategies, the question whether and how clusters and cluster policies can be used in this endeavour is highly relevant. Smart Specialisation Strategies are difficult to design and implement because they are based on a new and complex academic framework that now has to be translated into policy practice. The contention of this report is that lessons learnt from the rich history of cluster policies can provide concrete inputs into the development of Smart Specialisation Strategies (S3).

- The report investigates this contention both from conceptual and practical perspectives:
- Chapter 1 identifies the commonalities and differences between the two concepts as they are defined and discussed in the various strands of literature. This helps disentangle the key elements for which cluster policy experience can be used to inform and support Smart Specialisation Strategies, but also highlights the limits of this potential contribution;
- Chapter 2 looks at policy practice. It discusses the way Smart Specialisation Strategies are applied so far and the challenges that lie ahead, enlightens the main features of cluster policies and draws the lessons learned from their application. On this basis, it identifies six areas where cluster policies have the potential to contribute to Smart Specialisation Strategies.
- The key message is that clusters and cluster policies are for many regions likely to be among the key building blocks in developing and implementing S3. Main contributions are expected for the tasks of defining priority domains and engaging stakeholders, but other contributions are possible too. The full potential of clusters and cluster policies will be reached if:
- The Smart Specialisation Strategies integrate cluster policies into a broader transformation agenda for the entire regional economy, and complement cluster policies with other cross-cutting and technology/knowledge-domain-specific activities;
- The cluster-based analysis and the type of cluster policies implemented in S3s move beyond the current cluster policy practice, i.e. they are adapted to the regional environment, to the level of maturity of the cluster, and they comply with a list of good practices rules, including the capacity to address emerging new domains cutting across sectors.

## **SIMILARITIES AND DIFFERENCES BETWEEN CLUSTERS AND SMART SPECIALISATION STRATEGIES (S3)**

Clusters provide a conceptual framework to describe and analyse important aspects of modern economies. This framework is compatible with the conceptual underpinnings of the S3 approach, which is a programmatic framework to guide policy. Clusters and S3 share many similarities in their rationale: 1) a focus on productivity and innovation as key drivers of competitiveness; and 2) an accent on fostering regional embeddedness with a view to capitalise on the advantages of proximity.

There are important differences however: S3 focuses on specific innovation-intensive sectors while clusters apply to a broader set of sectors in the economy. S3 aims to exploit emerging linkages between economic activities that can cut across traditional cluster boundaries. And, probably most importantly, the explicit goal of Smart Specialisation Strategies – the transformation of regional economies around new knowledge-based activity domains – while the goal of cluster policies is often to enhance the performance of existing clusters.

Overall, clusters as phenomena in the economic landscape of regions are clearly highly relevant to Smart Specialisation Strategies. They are, in fact, quite likely to be the focus of attention for developing Smart Specialisation Strategies in many regions. However, the two concepts are not equivalent. Clusters are potential elements of a regional innovation eco-system, while S3 are wider policies aiming at transforming this eco-system. Clusters can come close to “smart specialisation domains” if they stimulate new types of knowledge spill overs with a high leverage effect on the growth path of the economy.

## **THE CONTRIBUTIONS OF CLUSTERS AND CLUSTER POLICIES TO SMART SPECIALISATION STRATEGIES**

- Cluster policies can provide a core toolkit to engage with and develop sectors of the economy in which a region has a significant position. They have the ability to guide the concentration and integration of economic policies around specific areas of the economy. And they can help avoid the pitfalls of traditional industrial policies, which often use tools that limit competition and thus ultimately competitiveness, and target narrow industries rather than broader groups of suppliers, service providers, and end producers engaged in the co-creation of economic value.
- We identify six leverage points for clusters and cluster policies to be used in Smart Specialisation Strategies. For the first and the last (prioritization and stakeholders engagement), already the current practice of cluster policies provides significant value to S3. For the remaining four, the cluster approach can in principle provide significant value but the actual practice of cluster policies often still falls short of this potential:
- Prioritization: how to select (and justify) priority intervention domains (at sufficient level of granularity) for S3? Methods to identify these domains can benefit from quantitative and qualitative approaches used in cluster selection (taking into account their limits, notably to identify new domains shaped by knowledge crossing traditional industry boundaries) and roadmaps defined by clusters can be used as inputs into the prioritization process;
- Integrated policy mixes: what is the appropriate mix of policies? What are adequate policies for S3? S3 involves the design of smart policy mixes, i.e. the effective combination of policy instruments, from different policy areas, that target the market or system failures in the specific activity domains. The diversity in cluster policies implies diversity in their potential contributions to S3 policy mixes. At one extreme, there are cluster policies which are limited to funding light catalytic actions (e.g. cluster animation cells) which may be of support to the S3 process in terms of prioritization and endorsement, but not so much for the design of integrated policy mixes; at the other extreme, cluster policies that consist of orienting a wide range of policy instruments from different policy domains towards clusters' needs, may come closer to full S3 policy mixes;
- Smart, evidence-based policy-making: what tools for evidence-based policy (measuring, assessing and learning in S3)? Lessons from cluster evaluations can be used to fine-tune policy portfolios. Even if the availability of robust and impact-oriented evaluations are still limited, the newer methods at play, focusing on cluster dynamics and trends, are potential inputs for iterative Smart Specialisation Strategies, which need periodically to revise strategic choices and policy mixes to support domains selected for smart specialisation;
- Multi-level governance: how to align policies across national, regional, EU levels? Cluster policy instruments rely most often on sources of funding from different origins. With respect to public funding it is crucial to achieve synergies, rather than duplications between these various sources, and to align goals pursued by the various authorities. Some clusters have long-term experience in achieving a good articulation of diverse sources of public funding, and these lessons can inform S3;
- Cross-border dimension: what is the appropriate territory to design a S3 and how to conduct policies that conform to it? Reinforcing the international dimension of the clusters and the domains of smart specialisation is a most pressing challenge: Europe needs clusters of worldwide excellence rather than sub-critical, inward-looking initiatives. Internationally competitive S3 domains are unlikely to correspond to regional boundaries: S3 requires trans-border strategies, building on complementarities. The lessons from clusters and cluster policies which have avoided this inward-looking stance can be used to address this challenge in S3. The lessons from the EU Regions of Knowledge programme, with its strong transnational dimension, are useful to address this challenge: internationally-relevant roadmaps provided by some Regions of Knowledge projects may be used as building blocks for the definition of S3 domains;
- Sustained stakeholders engagement: how to promote participation, engagement and commitment of the variety of stakeholders? Strategies to involve stakeholders in all phases of the S3 policy cycle, in order to ensure a bottom-up design and implementation of S3, wide and deep endorsement of the strategy, and its visibility to the outside world, can rely on existing platforms established in the context of clusters and cluster policies, and on "regional champions" associated to the clusters. Strategies to avoid capture by vested interests are critical for the success of S3.

- Cluster policies provide important *leverage points* for S3 but they are cannot be *equated* to S3: the former policies are among the possible policy tools in a S3 policy mix, but Smart Specialisation Strategies have a broader remit. Clusters efforts need to be embedded into a broader economic strategy that develops the clusters portfolio over time, enhances the general business environment to benefit all firms, and integrates cluster-specific and cross-cutting activities into a coherent overall value proposition for the location.

### **MAKING CLUSTER POLICIES WORK BETTER: CONDITIONS FOR EFFECTIVE CONTRIBUTION OF CLUSTER POLICIES TO SMART SPECIALISATION STRATEGIES**

The practice of cluster policies is characterized by heterogeneity of approaches and outcomes. For clusters and cluster policies to make their full contribution to S3, three key lessons from this rich experience of cluster practice should be kept in mind:

- First, the extent to which cluster policies are appropriate for a specific cluster, differs according to the stage of cluster development (mature versus emerging clusters);
- Second, the extent to which cluster policies are appropriate for a specific region, depends on the overall level of regional competitiveness (advanced versus lagging regions);
- Third, there are general lessons of good practice for clusters and cluster policies to take into account.

A further potential pitfall relates to the path-dependency/lock-in dynamics in regions with existing cluster policies. The existence of such policies in a region may be a hindrance to develop forward-looking S3, since there is likely to be a considerable degree of inertia, impeding the shift towards new, less traditional potentially more promising specialisation areas, crossing over the traditional sector boundaries along which many clusters are defined.

### **A ROLE FOR EU POLICIES**

EU policies can support the effectiveness and the potential contribution of cluster organizations and cluster policies to Smart Specialisation Strategies:

- Promote trans-regional learning on cluster policies;
- Continue and expand the development of a data infrastructure on clusters and cluster policies, with new emphasis on more advanced mapping indicators and on tools, methods and findings from evaluations of cluster policies;
- Promote a better use of the Territorial Cooperation Programme for the development of cross-border cluster efforts.

## **Introduction**

This report explores the role of clusters in the process of designing and implementing smart specialisation strategies. Smart Specialisation is a strategic approach to economic development through targeted support to research and innovation: such strategies are conditionality for accessing Structural Funds investments in research and innovation, as part of the Cohesion Policy's contribution to the Europe 2020 jobs and growth agenda during the period 2014-2020. The underlying rationale behind the Smart Specialisation Strategies concept is that by concentrating knowledge resources and linking them to a limited number of priority activities, countries and regions can become — and remain — competitive in the global economy.

While smart specialisation is a new term introduced in European policy-making, it builds on existing practices in regional development and innovation policies. In the past decades, many European regions and Member States have designed and implemented such policies. In this context, fostering clusters has often become an important part of regions' economic policy agenda. Hence many regional and national governments have acquired a sizeable experience in running cluster policies and programmes. At the same time, governments are struggling to come to grips with the new concepts that underpin Smart Specialisation Strategies and in particular the challenge of developing concrete policies. In regions endowed with a cluster policy, questions arise as to the difference between clusters and smart specialisation domains, and whether cluster policies can be the foundation stones for Smart Specialisation Strategies (or even entirely correspond to those strategies). Since both cluster policies and smart specialisation strategies are policy approaches with a place-based dimension that aim at economic growth and competitiveness, the question of the differences, similarities, and contribution of one approach to the other, is highly relevant.

This report tackles this core question in two steps:

- Chapter 1 identifies the commonalities and differences between the two concepts as they are defined and discussed in the various strands of literature. This helps disentangle the key elements for which cluster policy experience can be used to inform and support Smart Specialisation Strategies, but also highlights the limits of this potential contribution.
- Chapter 2 looks at policy practice. It discusses first, the way Smart Specialisation Strategies are applied so far and the challenges ahead and second, enlightens the main features of cluster policies and draws the lessons learned from their application. On this basis, it proposes an argumentation for several areas where cluster policies have the potential to contribute to Smart Specialisation Strategies.

The last Chapter (Chapter 3) provides overall conclusions and recommendations for the EU, with the view of drawing the benefits, and avoiding the pitfalls, from cluster policies to nurture Smart Specialisation Strategies in Europe.



## **Chapter 1: Smart Specialisation Strategies and Clusters: conceptual linkages and differences**

### **1. Introduction**

The purpose of this Chapter is to review the key ideas in the debates on Smart Specialisation Strategies and to compare and contrast these with the theoretical underpinnings associated with clusters. It argues that, despite many commonalities, clusters and Smart Specialisation Strategies are not equivalent concepts.

There is now an extensive literature on both of these themes and it is not the intention here to review these extensively. However, there are key aspects of the current debate that need to be articulated in order to assess the overall positioning of a clusters approach within Smart Specialisation Strategies.

The first section of the Chapter provides an overview of Smart Specialisation Strategies: it enlightens the new and distinctive concepts underpinning it and makes the point that the term refers to a policy framework or a set of principles that are used to guide policymaking. The second section details the various concepts included under the term “clusters”: theories of regional clusters can be used to explain why some regional economies might perform better than others and also to justify cluster-related policy interventions. The last section concludes on the conceptual linkages and differences between these two sets of concepts.

#### **1.1. SMART SPECIALISATION STRATEGIES: THE CONCEPT**

Smart Specialisation Strategies (S3<sup>1</sup>) refer to regional strategies that “generate unique assets and capabilities based on a region’s distinctive industrial structures and knowledge base” (European Commission 2012). This concept is closely linked with the EU call for attention to “smart growth” strategies that are soundly based on knowledge and innovation and embedded in regions. The Commission defines Smart Specialisation Strategies around five key elements (Box 1).

#### **Box 1. Definition of Smart Specialisation Strategies**

National/regional research and innovation strategies for smart specialisation (RIS3 strategies) are integrated, place-based economic transformation agendas that do five important things:

- They focus policy support and investments on key national/regional priorities, challenges and needs for knowledge-based development;
- They build on each country's/region's strengths, competitive advantages and potential for excellence;
- They support technological as well as practice-based innovation and aim to stimulate private sector investment;
- They get stakeholders fully involved and encourage innovation and experimentation;
- They are evidence-based and include sound monitoring and evaluation systems.

**Source: European Commission 2012**

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<sup>1</sup> In this report we use the concept of Smart Specialisation Strategies (S3) as an equivalent to the concept, subsequently used by the European Commission, of “national/regional research and innovation strategy for smart specialisation (RIS3)”.

## **Key characteristics of Smart Specialisation Strategies as a place-based approach**

From these debates, it is possible to distil the following key points about the concept of Smart Specialisation Strategies and its application at the regional scale (Box 2). These features will be used in the concluding section to compare this concept with the cluster concept.

### **Box 2. Key features of the concept of Smart Specialisation Strategies**

Transposing the original concept of Smart Specialisation Strategies to the regional scale creates a focus on the following key features:

- Place-based;
- Focus on R&D and Innovation;
- Cross-sectorial connections and “domains”;
- Key role of entrepreneurial actors;
- Critical mass and scale of activity.

#### **1.1.1.1. Place-based**

While initially developed as an a-spatial concept, it is now widely recognised that Smart Specialisation Strategies necessitate a “place-based” approach to innovation. This requires a good understanding of specific regional circumstances based on assessments of local assets and capabilities informed by research on local sources of knowledge, value chains and external connections. The approach recognises the significance of path-dependencies and the competitiveness of firms and institutions within their sector.

#### **1.1.1.2. Focus on R&D and Innovation**

The definition of Smart Specialisation Strategies has evolved over time. Recent explanations explore how the ideas underpinning Smart Specialisation relate to conventional theories of specialisation which show how nations (and regions) can gain comparative advantage by focusing on economic activities that exploit differences in national factor endowments. As noted by Foray *et al* (2011), Smart Specialisation Strategies differ from this in that the concept focuses specifically on R&D and innovation processes that cut across conventional definitions of sectors. Hence, Smart Specialisation Strategies involve the adoption, dissemination and adaption of General Purpose Technologies (GPTs) across a wide range of sectors. These strategies address “the missing or weak relations between R&D and innovation resources and activities on the one hand and the sectorial structure of the economy on the other” (Foray *et al* 2011; p5).

#### **1.1.1.3. Cross-sectorial connections and “domains”**

The concept also rejects a division of labour between knowledge producers and knowledge users. Instead, it is argued that there is a need to understand and seek to support intra-sectorial, and inter-sectorial, spill overs of knowledge that occur within knowledge domains which are defined as the socio-economic contexts within which innovation occurs. The potential for innovation involving new applications of technologies is therefore likely to be affected by the scale and level of connectedness of any domain (overlapping social settings that lead to knowledge spill overs between domains that possess “related variety”).

#### **1.1.1.4. Key role of entrepreneurial actors**

The concept of Smart Specialisation emphasises the significance of learning processes involving *entrepreneurial actors*: these are regarded as the agents that will bring about the best combinations of knowledge-related specialisation. These actors are understood in a broad sense to include firms, Higher Education Institutions (HEI), public research institutes as well as independent innovators and consortia that bring together many different actors. It is argued that policy should seek to enable such agents to engage in invention and innovation. This knowledge is “embedded” and local entrepreneurs are regarded as leading actors in innovation that involves the creation of new products, markets, technologies and processes. In that sense, new specialisms emerge from existing competences and human capital endowments, a process that resonates with the concept of comparative advantage outlined above. It also connects well with debates surrounding path-dependencies in industrial transitions.

Proponents of Smart Specialisation recognise that such knowledge specialisation cannot be defined or imposed by top-down policymaking. It is argued that while entrepreneurial discovery is essential, the development process requires a "*bi-directional iterative dynamic*" (Foray *et al* 2011, p.10) where there is a role for systematic top-down directions in order to channel resources, monitor and assess outcomes, address potential coordination failures and disseminate and guide the formation of shared strategic vision. This includes the need to identify entrepreneurial discoveries.

#### **1.1.1.5. Critical mass and scale of activity**

The Smart Specialisation Strategy concept does not make explicit reference to the question of scale of activity. However, several of the key processes included do imply that S3 are more likely to succeed where there is a critical mass of certain actors or firms involved in innovation. At the outset, S3 need to be based on a realistic assessment of local assets and this will partly depend on the scale and level of interaction between existing firms. Similarly, while entrepreneurial discoveries arising from spill overs between knowledge domains can be characterised as unique "one-off" events, the chances (and frequency) of such occurrences may be related to the size and scale of knowledge domains within particular regions and the number of entrepreneurial actors operating on the boundaries of these domains.

#### **Smart Specialisation Strategies as iterative, tailor-made policy processes**

The above definition illustrates the point that the S3 concept refers to a *policy process* rather than any specific theory of regional change. It is a policy-making approach that recognises that effective regional interventions need to be tailor-made, relevant, based on realistic assessments of regional assets and constructed around the commitment of regional entrepreneurial actors. This perspective is further described through a division of the S3 design process into "six steps", each of which relates to the *process* rather than a theory or even any specific policy objective (European Commission 2012):

- Step 1: Analyse the regional context and potential for innovation;
- Step 2: Ensure participation and ownership;
- Step 3: Elaborate an overall vision for the future of the region;
- Step 4: Identify priorities;
- Step 5: Define a coherent policy mix and action plan;
- Step 6: Integrate monitoring and evaluation mechanisms.

Following this logic, there is no such thing as a specific policy portfolio for S3, since the *policies need to be adapted to each regional profile*. The S3 content – in the form of a mix of policy tools – will vary according to the strategic priorities and regional strengths, needs, potential and bottlenecks. This differs from many previous regional innovation policies that were driven by particular instruments of change, such as science parks, incubators, technology centres, technology transfer organisations, competence centres, and indeed cluster programmes. That is not to say these are excluded as possibilities, but these instruments are not prescribed in the strategy itself but subject to the policy process outlined above. The necessity of interaction between these steps is also critical: we return to this point in section 2.2 below.

In order to arrive at a tailor-made, relevant and effective policy mix, it is necessary to set in motion an adequate policy process. This requires high strategic level/oversight of relevant strategies and an effort to create synergies between them, whilst at the same time bringing in the entrepreneurial actors/perspective in a bottom-up approach.

#### **Smart Specialisation Strategies as responses to typical policy flaws**

The adoption of the ideas embraced by the Smart Specialisation Strategies concept has been in response to a *critique of past regional interventions*. The critique includes the following:

- Lack of engagement with private sector actors (public sector lead);
- Insufficient analysis of regional assets and possibilities leading to unrealistic expectations;
- Inappropriate transfer of ideas and models from exemplar regions into others;
- Tendency for regional strategies to chase the same "bandwagon" sectors and technologies;
- Lack of attention given to trans-regional aspects.

The S3 concept is appealing because it aims to address several of these criticisms. Smart Specialisation Strategies, for instance, emphasise the involvement of entrepreneurial actors in the design of policy, not just in delivery. The approach stresses the need for better understanding of transitions from one sector to others and greater appreciation of the scope for (and limitations of) diversification. Smart Specialisation Strategies involve bottom-up engagement with actors and more realistic expectations informed by analysis of regional path-dependencies.

### **Smart Specialisation Strategies: evolution of a concept towards a “place-based” dimension**

While Smart Specialisation has become a key concept for regional innovation, use of this term actually originates in attempts to improve understanding of the productivity and R&D gap between Europe and key trading partners, notably the US (European Commission 2009). This analysis starts from the observation that the EU is disproportionately characterised by sectors with lower productivity. It has been suggested that policy needs therefore to focus on stimulating sectors with high productivity growth, and ICT producing sectors in particular. The way in which the concept has been applied to regions, however, has been honed, in part, through critical appraisal (McCann and Ortega-Argiles 2011, Camagni and Capello 2012). Regional scientists stress that translating the Smart Specialisation logic to the regional scale is less straightforward than might be presumed:

- Smart Specialisation ideas originally emphasised the significance of formal R&D and “Key Enabling Technologies” (such as nanotechnology, electronics, biotechnology, photonics, advanced materials (European Union 2011)) and paid less attention to regional innovation processes that have been shown to be significant in promoting regional economic growth (tacit knowledge, embedded social networks, innovative milieu etc.). The current definition of Smart Specialisation Strategies however addresses this by referring to “practice-based innovation” as well as technological change;
- Regions (and indeed many smaller EU countries) are far more open entities compared to nations or trading blocs which means there is a need to understand regional externalities, interdependencies between actors, firms, organisations (of the type that have been the focus of many cluster initiatives);
- Regional policy has traditionally targeted regions that are disadvantaged by structural weaknesses, knowledge gaps and institutional limitations. It has been pointed out that these are not the types of regions likely to be central to a narrow interpretation of Smart Specialisation Strategies which focuses on high productivity growth, knowledge intensity and formal R&D.

These debates have focused on fundamental questions relating to the role and purpose of interventions within regions and the need for policies to address explicitly questions concerned with spatial distribution and regional inequality. This discussion has been couched in terms of the need for policies to be “place-based” as opposed to “place-neutral”. Barca (2009) argues that “*place-based approaches* assume that the geographical context matters and that this will inevitably affect the way in which policies operate. Place-blind interventions, therefore, can generate unintended spatial consequences that can, in time, frustrate or even negate the purpose of any policy and lead to under-utilisation of regional resources and persistence of social exclusion and regional inequalities. Strategies that consider the regional or local consequences and also the local responses to policy intervention are therefore more likely to create the desired outcomes in terms of social, economic and cultural conditions in communities.

Furthermore, the development of a place-based approach to policy draws attention to the significance of processes that occur at the sub-national scale that affect the production and dissemination of knowledge and the application of new ideas and innovation. A recent analysis published by the OECD (2009), for instance, recognises that there is a “strong spatial content to growth” and that without an understanding of “place” there is a strong possibility of creating a “leaking instead of a linking process” between regions characterised by negative externalities associated with increased centralisation of human capital and infrastructure. National and international development, therefore, is best achieved by mobilising regional assets and synergies between regions through integrated regional policies. This set of arguments implies that Smart Specialisation Strategies, which were initially developed from an a-spatial concept, have needed to be reworked and redefined in the context of regional analysis.

## **Smart Specialisation Strategies for all types of regions: promoting related variety**

The concept of “*related variety*” is particularly relevant to the S3 concept. This idea arose out of debates as to whether innovation is more likely to occur in regions that are diversified rather than specialised because there are more opportunities afforded, in the former, for knowledge spill overs between different sectors. However, such spill overs are only likely to occur where there is some form of “relatedness” between sectors. Related variety exists where sectors share some form of complementary competences. Theorists argue, therefore, that innovation is not associated *per se* with either high levels of specialisation or diversity but with high levels of cognitive proximity and shared competencies between local or regional specialisms (Boschma and Iammarino 2009; Frenken *et al* 2007). These ideas have also been outlined by the “Constructing Regional Advantage” Expert Group (European Commission 2006). Innovation occurs through interaction *across* industry boundaries and these are often spatially localized.

The existence of such related variety is clearly essential to the concept of Smart Specialisation Strategies which is predicated on local entrepreneurial processes that seek to exploit existing specialist technologies in related new fields (i.e. cross sectorial knowledge flows). In this way, S3 responds to the above critique of regional policies that have often been based on inappropriate replication of ideas and models from flagship regions into others and also a tendency for regional strategies to position themselves around the same set of sectors and technologies. This requires: engagement with key regional actors, realistic assessments of local assets and effective regional leadership that is prepared to make hard decisions on priorities (European Commission 2012).

The exploitation of related variety and knowledge spill over through smart specialisation is viewed by Foray *et al* (2011) as a precursor of structural changes of various types, which apply to diverse regional environments, thereby addressing the criticism of S3 being only relevant for regions which are at the technology frontier:

- “New domains can emerge from existing industrial commons” (p.9) to create new sectors and product-markets;
- Traditional sectors can be transformed and renewed by the spread of General Purpose Technologies (GPTs – generic technologies that have wide applications and therefore high propensity for spill over between sectors, e.g. electronics, nanotechnology);
- Regional economies can be subject to diversification through the development of new lines of productive activity.

### **1.1.2. Clusters: the concept**

A distinction needs to be made between clusters as phenomena that exist within regional economies, on the one hand, and policy interventions and practices that are based on the concept of clusters, on the other hand. Here we discuss the definition of *clusters as phenomena* in the economic landscape of regions, starting with the theoretical basis, moving to a review of the diversity of cluster types, a note on the link between cluster and triple helix concepts, and a last point on cluster life cycles. With this, we conclude in the next section on the proximity and differences between the two concepts of Smart Specialisation Strategies and clusters. This will provide the basis for the next Chapter, which discusses the outlook of cluster policies and examines how these can respond to the challenges of Smart Specialisation Strategies.

#### **1.1.2.1. Cluster theories: capitalising on the advantages of proximity**

The cluster concept has a long evolution that has generated an extensive literature (see review by Cruz and Teixeira 2010). A cluster can be defined from a descriptive perspective as “a geographically proximate group of interconnected companies suppliers, service providers and associated institutions in a particular field linked by externalities of various types” (Porter 2003, p.562). The discussion surrounding clusters is situated within a broad spectrum of ideas that relate to the significance of location and spatial proximity for industrial performance and competitiveness. In order to understand the significance of clusters as phenomena and the extent to which policies can influence them, it is necessary to extend this definition to embrace spatially-dependent processes that are thought to affect competitiveness.

Many of the processes that have been subsumed within the concept of clusters are based on the interest in Alfred Marshall’s notion of the industrial district which emphasises external economies of scale, inter-firm division of labour and the role of local social capital. These ideas were revived during the 1980’s in various guises including the concept of flexible specialisation and industrial districts of the so-called “Third Italy” (Becattini *et al* 2009) and “new industrial spaces” which emphasised non-

traded interdependencies and reduced transaction costs within local production systems (Storper 1995).

Other writers have placed greater emphasis on the *social characteristics* of economic activity including the importance of local innovative milieu for innovation and entrepreneurship (Grannovetter 1985, Maillat 1998, Crevoisier 2004). These writers emphasised the less tangible aspects of economic performance related to social relationships and the role of business networks. There are also parallels between these approaches and that of systems of innovation and the significance of face-to-face contact for the exchange of uncoded or tacit knowledge between firms and institutions (Lundvall 1992).

It is these ideas that provided a basis for Porter's highly influential holistic model of the relationship between geographical concentration and industrial competitiveness (Porter 1990, Porter 1998, Ketels 2011). Porter's "commonalities and complementarities" were interpreted as involving the coexistence of competition (rivalries) as well as collaboration that generate localised externalities that contribute towards competitive advantage. Porter's theories have stimulated an extensive debate (Martin and Sunley 2003) which in turn has spawned a *diversity of definitions of regional clusters* (for instance, Gordon and McCann 2000, Gertler and Wolfe 2006; Asheim et al 2006).

The literature discusses at least three sets of inter-linked arguments related to the ways in which proximity or spatial concentration might be a source of competitive advantage (Box 3). The assumption in cluster theory is that proximity generates these benefits that are related to traded and non-traded interactions between firms, institutions and individuals. Proximity, it is argued, facilitates face-to-face contact that is thought to be necessary for the creation of social capital, reduces transaction costs between firms and facilitates sharing of tacit knowledge through interaction, observation and imitation.

### **Box 3. Underpinning clusters: advantages of proximity**

- Advantages based on regional external economies of scale and agglomeration. These include enhanced productivity arising from localisation of production systems which generates opportunities for greater specialisation, division of labour and inter-firm linkages. Agglomeration also provides a basis for enhanced local skills supply and a pool of localised knowledge that is shared between firms.
- Advantages associated with social networks. These are linked to the significance of interpersonal relationships in generating trust within business networks which is believed to create social capital that transcends the boundaries between firms and institutions.
- Advantages derived from regional innovation systems and local knowledge exchange. These ideas emphasise the significance of local learning processes that include access to local tacit knowledge and its value in generating competitive advantage.

Regional experts have challenged some of the more simplistic interpretations of the meaning of proximity, extending the discussion to include *other forms of proximity* besides physical distance (cognitive, organizational, social and institutional) (Boschma 2005). The literature also draws attention to the significance of global connections between regional clusters which enhance and maintain the competitiveness of regional clusters (Bathelt et al 2004). As Malmberg (2003) has noted, empirical research on clusters has generally tended to show "modest commercial relations between firms within spatial clusters" and that "other types of collaboration are more common locally, but such relations normally extend well beyond the borders of narrowly defined regions" (p.153).

#### **1.1.2.2. Clusters and the triple helix concept**

The clusters debate has also been influenced by theories of knowledge management and the dynamics of innovation systems. In particular, the concept of Triple Helix has been influential in research on knowledge-intensive clusters where research institutes and universities play a prominent role. The Triple Helix refers to the relationship between universities, private industry and government. Etzkowitz and Leydesdorff (2000) argue that the linear models of innovation and technological change are "insufficient to induce transfer of knowledge and technology" (p. 110). Rather, knowledge spillovers occur due to the *interaction* that takes place between actors in these different spheres. The key to innovation has been viewed as crossing (or breaking down) barriers that exist between institutions. This has led to considerable interest in the concept of the "Third Mission" for universities (knowledge transfer and service to society activities alongside teaching and research (Lawton-Smith and Bagchi-Sen 2010; Lengyel and Leydesdorff 2011)).

The Triple Helix approach has some value in that it provides an analytical framework for investigation of the role of key institutions as *knowledge brokers* within regional systems of innovation (Kauffeld-Monz and Fritsch 2013) and this has direct relevance to the role of “entrepreneurial actors” as defined within the debates on Smart Specialisation Strategies. Recent critiques of the Triple Helix, however, also draw attention to the limitations imposed by its emphasis on larger institutions which has led to a debate concerning quadruple- or multi-helix models that incorporate other influences of innovation processes including, in particular, aspects of civil society (e.g. regional cultures, lifestyles, values that influence public opinion) as well as “fourth pillar organisations” (independent, not-for-profit, member-based organisations) (MacGregor et al 2010).

### 1.1.2.3. Cluster evolution and life cycles

Studies have also been conducted of cluster evolution and cluster life cycles<sup>2</sup>. These ideas are particularly pertinent for policymakers seeking to influence the evolution and growth of established and new clusters. The basic cluster life cycle adapts its nomenclature from the product cycle model involving phases of emergence, growth, maturity and decline. Attempts have been made to show that different phases of cluster evolution can be associated with variations in knowledge-intensity, European Commission, inter-firm relations and determinants of success including those thought to be derived from agglomeration (Shin and Hassink 2011). However, these studies tend to be descriptive and hence lack predictive power.

Many of these ideas have been taken further in the context of recent interest in evolutionary economic geography and the significance of path-dependency for understanding regional change. Empirical studies for a number of European countries have confirmed that regions’ specialization patterns change over time in a process of related specialization (Boschma *et al.* 2013, Neffke *et al.* 2011). New clusters are shown to be much more likely to emerge when they have linkages to clusters that already have a significant position in a given region. The presence of related clusters had earlier already been shown to have a positive static effect on the impact of clusters on economic outcomes (Porter 2003; Delgado *et al* 2012).

### 1.1.3. Conclusion

To conclude on the relationship between Smart Specialisation Strategies and clusters, in what ways, and to what extent are theories of clusters of relevance to the concept of Smart Specialisation Strategy? Foray *et al* (2011) express the view that Smart Specialisation Strategies are “not the same thing as cluster policy” (p. 16). This, they argue, on the basis that cluster policies have too often tended to foster “knowledge base standardisation” and “wasteful duplication of R&D effort”. Smart specialisation on the other hand involves discovery of what makes a local knowledge base “original and somewhat unique”. This view may have some credence in terms of the practice of some cluster policies where there has been a tendency for regions to focus on a similar narrow range of fashionable sectors (Hospers 2005, Peck and Lloyd 2008). But it does not invalidate the ideas subsumed in cluster theory and the relevance they may have for delivery of S3. Indeed, it can be argued that the S3 debate has reinforced the need for greater clarity in defining the role and purpose of clusters and an improved understanding of the entrepreneurial process which is “often one of the least well documented and most critical elements of successful clusters” (Wolfe and Gertler 2004, p. 1076). S3 is as a new policy concept based on a variety of theoretical insights and ideas still facing the challenges of practical implementation. In this process it will face the same pitfalls that have become evident as the cluster concept was translated into policy practice.

From the above discussion of the two concepts, it appears that they are compatible but have different emphases. S3 and clusters share two critical elements: 1) a focus on productivity and innovation as key drivers of competitiveness; and 2) an accent on fostering regional embeddedness with a view to capitalise on the advantages of proximity. But there are also differences in emphasis between the two concepts: S3 places a higher emphasis on the exploitation of related variety and knowledge spill overs between knowledge domains, with a premium on emerging new market niche opportunities, while clusters tend to concern firms in related industries characterised by a critical mass and commonalities in infrastructure and resource base. The most important difference concerns the explicit goal of Smart Specialisation Strategies – the *transformation of regional economies* around unique, knowledge-based, new activity domains – while the goal of most clusters is to enhance the performance of the companies that are members of the cluster (Table 1).

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<sup>2</sup> See Regional Studies special issue Vol 45 (10), November 2011.

**Table 1. Similarities and differences in emphasis between Smart Specialisation Strategies and clusters**

Smart Specialisation Strategies	Clusters
<b>Similarities</b>	
<ul style="list-style-type: none"> <li>• Drivers of performance: productivity and innovation are critical for sustained growth</li> <li>• Multiple factors influence productivity and innovation</li> <li>• Importance of proximity and local spill overs and a critical role of locational context</li> </ul>	
<b>Differences in emphasis</b>	
Exploring emerging market opportunities	Critical mass
Facilitating knowledge spill overs between knowledge domains	External effects through shared infrastructure and input markets
Exploit related variety between knowledge domains	Groups of companies in related industries
Drive structural change of an economy by embedding innovative practices in economy and society	Enhancing performance of a set of linked companies

We conclude, therefore, that clusters as phenomena in the economic landscape of regions are clearly highly relevant to Smart Specialisation Strategies. Clusters, as we have defined them in this chapter, are, in fact, quite likely to be the focus of attention for developing Smart Specialisation Strategies in many regions. However, the two concepts are not equivalent: clusters –depending notably on their position in their lifecycle and the level and extent of their success and impact at national or regional level- are potential components of a national/regional innovation eco-system, while S3 are wider policies aiming at transforming this eco-system. Clusters can come close to “smart specialisation domains” only if they stimulate new types of knowledge spillovers with a high leverage effect on the growth path of the economy.

Those similarities and differences appear when looking at the five key characteristics spelled out above for S3, from a cluster perspective.

### **Place-based**

S3 emphasises social processes that occur within “domains” that are embedded in particular local and regional settings. While the literature on clusters suggests proper caution in interpreting “domains” as simply equivalent to “regions”, the notion of embedded social processes is important for both cluster theory and S3.

### **Focus on R&D and Innovation**

The focus on R&D and innovation is at the essence of S3. While R&D is likely to be an important element in any regional cluster, not all clusters claim to be research-based or innovation-oriented. In that sense, a narrow interpretation of Smart Specialisation Strategies that focus on R&D is likely to be relevant only to a small number of regions that contain research-intensive clusters of activity. However, the concept of Smart Specialisation Strategies embraces a much wider range of innovation processes that extend well beyond formal R&D which makes the concept relevant to many of the concepts enshrined in cluster theory.

### **Cross-sectorial connection**

S3 emphasises cross-sectorial linkages and the processes that lead to the emergence of new technologies and the application of existing technologies in new commercial settings. This is consistent with theories of clusters that involve business networks and associations that cut across conventional definitions of sectors defined by product types and markets. Indeed, the concept of related variety appears to have much in common with both Smart Specialisation and the processes associated with what are commonly termed “emerging clusters” or “emerging technologies”.

### **Key role of entrepreneurial actors**

S3 regards entrepreneurs as key actors in the process of innovation that leads to Smart Specialisation. While cluster theories tend to focus more on linkages, networks and social processes as a basis for competitiveness (business interaction, interdependencies, local learning processes, social capital), entrepreneurial activity is clearly central to these social processes. As noted by Feldman and Francis (2006), the early genesis of most US clusters was “path-dependent and idiosyncratic – with entrepreneurial activity and firm strategy playing a decisive role” (p. 126). Under Smart Specialisation, one characteristic of entrepreneurial actors concerns their ability to make connections between different knowledge domains. The ability of key actors to operate on boundaries between institutions, cultures and social settings has also been a key attribute of successful clusters. We can conclude, therefore, that while aspects of the clusters debate place greater emphasis on shared knowledge and interactions in networks, S3 has a higher emphasis on placing entrepreneurial activity and the behaviour of firms at the core of innovation.

### **Critical mass**

Cluster theories make explicit reference to scale advantages, either in terms of localised external economies of scale or in relation to increased opportunity for interaction and knowledge-sharing when operating within a regional network. In contrast, S3 makes no explicit reference to scale effects, but it can certainly be argued that S3 strategies are more likely to succeed where there is a critical mass of certain actors or firms involved in innovative activity. Other things being equal, there is a much greater chance of entrepreneurial discoveries in regions where there is a critical mass of actors who are open to new ideas.

## **1.2. CHAPTER 2: SMART SPECIALISATION STRATEGIES AND CLUSTERS: POLICY PRACTICE**

### **1.2.1. Introduction**

This Chapter investigates the way in which the experience with cluster policies can be leveraged in Smart Specialisation Strategies.

The practical experience with Smart Specialisation Strategies (section 2.2) is still limited since EU regions and countries have only started working on these since 2011-2012. Nevertheless, a range of issues is already visible from the existing early efforts as well as the broader history of regional development policies in Europe. These pave the way towards the most critical elements to which the experience with cluster policies have the potential to contribute.

The large diversity in clusters and cluster policies makes it complex to draw simple conclusions about actions and outcomes; more complex than the academic debate about cluster policy suggests. Among the overall lessons learned from the implementation of cluster policies (section 2.3) the need to align cluster policies with the specific cluster/regional context is one of the most important, alongside general rules of good practice. More detailed aspects of cluster policies are also discussed, selecting those that are likely to be most relevant, seen through the S3 lenses.

Finally, matching the challenges for Smart Specialisation Strategies with lessons from cluster policies, conclusions are drawn as to where and how the latter can support the former (section 2.4). Six domains where clusters can provide building blocks for Smart Specialisation Strategies are identified.

### **1.2.2. Smart Specialisation Strategies: the challenges of practice**

Since the concept of Smart Specialisation Strategies has been endorsed formally in the discussion on EU Cohesion policy, everywhere in the EU, regions and countries wishing to access these EU funds are engaged in the design and implementation of such strategies. Despite the variety in regions and countries' economic, innovation and institutional profiles, key common challenges can be identified in their journey towards S3.

The work of the S3-Platform of the European Commission, a recent study by the OECD (OECD 2013) involving 17 case studies, as well as other publications<sup>3</sup> and field experience, shed light on the advances and pitfalls experienced in trying to implement the concept of Smart Specialisation Strategies in European regions. This section goes first into more detail on the S3 process itself, expanding on the six steps proposed in the EU S3 guide (European Commission 2012, see section 1.2). Next, it proposes and discusses key challenges to which policy-makers, involved in designing and implementing these strategies, are confronted in practice. This discussion provides the background against which the possible contribution of cluster policies is to be discussed.

### **The anatomy of the Smart Specialisation Strategies as iterative processes**

Taking the six interactive steps of S3 as a point of departure (section 1.2), more detailed tasks for policy-makers on the S3 road can be identified. Despite the variety in history and context of policy-making in each specific region, ten elements can be considered as key ingredients of S3 (Box 4).

The S3 process is *iterative*: strategy development is not a "once and for all" event but a process over time involving interaction between partners which constantly shapes and modifies priorities as circumstances change. S3 are evolutionary policies because they aim at developing new, forward-looking paths for regional economies and these paths are changing continuously due to external shocks and internal changes. Hence the process needs to include regular revision of goals and means;

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<sup>3</sup> See notably the special issue of *Ekonomiaz* (2013), n°83, on Smart Specialisation Strategies.

#### **Box 4. The anatomy of the S3 process**

Co-design and co-delivery of an overall shared vision for the future of the country/region, with the commitment of the key players, building on relevant existing strategies and investments, wide stakeholder engagement and consensus-building processes;

Definition of scope and process for the definition and successful co-delivery and implementation of the strategy through a partnership approach– Ensuring wide participation, ownership and integration beyond policy silos;

Identification of regional potential for innovation-driven differentiation, relying on entrepreneurial actors and evidence base;

Preparation and wide discussion (stakeholder consultations) of realistic “transformation” scenarios for the regional economy;

Selection of priorities in the form of areas of smart specialisation - political endorsement for the S3 and its priorities;

Definition/design of coherent policy mixes associated to measurable targets and budgets, launch of pilot projects;

Integration of monitoring and evaluation mechanisms into the strategy;

Development and use of strategic policy intelligence resources and capacities;

Communication of the S3, at strategic and operational levels;

Update of the S3, based on a review of evolution of regional economy and of the impact of policy mix on the evolution of smart specialisation areas;

The S3 process points to the fact that, like the human body, all parts need to be present and function well, but also importantly, they need to interact with each other for the whole body to function well. In order for an S3 to be successful, the presence of all these elements is required, but proper linkages between them are essential too. The various ingredients are influencing each other. For example: without appropriate communication on the S3, wide ownership and political endorsement will be difficult to achieve; the definition of policy mixes goes along with the definition of monitoring and evaluation indicators and targets; the latter cannot be properly defined failing an explicit selection of priorities; realistic transformation scenarios need to be fuelled with good entrepreneurial knowledge on regional potential, etc.

#### **State-of-the-art in Smart Specialisation Strategies: six policy challenges**

Many regions in the EU are working on Smart Specialisation Strategies, but at the time of writing this report, few have developed fully-fledged and complete strategies covering all the above elements. For the Commission, this is a learning process too, and the criteria for acceptance of proposed strategies as complying with the requirements of the concept, have not yet reached the stage of commonly agreed practice. On both sides thus, it is a learning-by-doing exercise, influenced by past practices, but with an effort to incorporate the new views aiming at correcting the failures in past practices, as pointed out in Chapter 1.

The present assessment of the state-of-the-art in Smart Specialisation Strategies design and implementation can only cover early attempts, without incorporating views on success or failures on *impacts* of those new forms of policies.

The observation of these initial efforts to design and implement Smart Specialisation Strategies in practice, in European regions, suggests six main (largely unsolved!) challenges for policy-makers (Box 5).

## **Box 5. Six challenges to implement Smart Specialisation Strategies in practice**

CHALLENGE 1: The “prioritization” challenge: how to select (and justify) priority intervention domains for S3?

CHALLENGE 2: The “integrated policy” challenge: what are the adequate policies for S3?

CHALLENGE 3: The “smart policy-making” challenge: what tools for evidence-based policy (measuring, assessing and learning in S3)?

CHALLENGE 4: The “multi-level governance” challenge: how to align policies from national, regional, EU levels?

CHALLENGE 5: The “cross-border collaboration” challenge: what is the appropriate territory to conduct a S3 and how to conduct policies that conform to it?

CHALLENGE 6: The “stakeholders engagement” challenge: how to promote participation, engagement and commitment of the variety of stakeholders?

### **The prioritization challenge**

According to the Smart Specialisation Strategies concept discussed in Chapter 1, selecting priority domains for public intervention should rely on an “entrepreneurial discovery process”. Top-down technocratic choices are confronted with the too risky task of “picking the winners” of the future. The reason for relying on “entrepreneurs” (entrepreneurial actors which can include, e.g. universities with an entrepreneurial drive) for prioritization is that these should in theory be best placed to identify upcoming market opportunities giving rise to competitive activities from a critical mass of firms in the region. Identifying the stakeholders to be involved is discussed in the last challenge (stakeholders engagement).

As indicated in Chapter 1, a key rationale behind the concept relates to the fact that regional policies do not differentiate sufficiently between possible priority domains, which results in a replication of prioritization on the same “key sectors” across too many regions. Hence rather than replicating priorities found elsewhere, areas of smart specialisation should focus on *original combinations* of activities (across sectors, technologies...) with the sufficiently fine-grained definition necessary for differentiation.

The main open questions in Smart Specialisation Strategies endeavors across Europe, with respect to the prioritization challenge, are:

- Who are the entrepreneurs, what are their priorities?
- Who coordinates the priority-setting? And what are the guiding principles?
- How to define “areas of specialization” which cut across sectors, clusters, technologies and thus go largely unrecorded?
- What is the relevant level of granularity in the definition of these priority domains?
- How to go politically with those sectors/areas that are *not* prioritized?
- At what frequency rate could priority areas be revised in order to maintain some stability in the strategy and at the same time cater for changes in competitive position of those areas?
- How to sustain the process over the long-term in terms of renewal and iteration? How to decide when a particular priority stops being a priority?

### **The integrated policy challenge**

Once vision and priorities for knowledge-based regional development are defined, the portfolio of policy instruments needs to be reviewed, fine-tuned to support the strategic goals and tailored to address the particular needs of the priority domains/niches. Some instruments may already be working well in line with the strategy, while other might need revision or even be suppressed.

A key challenge for many regions is to align individual policies with each other in the context of an integrated strategy where specific efforts systematically reinforce each other. This problem occurs both at the level of the overall regional economy and individual priority domains/niches. An effective S3 adapts the existing set of institutions, organisations, programs (and capacities and resources) to a vision of the future. A main bottleneck lies in the inertia of the policy system (and to financial and human constraints especially in the case of small countries). Part of the policy system is locked in because of the silo approach and the vested interest of the incumbent actors which have an interest in

the status quo. Despite new high-level orientations, actors involved in the operation of the policy mix might not have the right incentives to endorse and implement the needed changes (see the “stakeholders engagement” challenge below). Regulatory and mental barriers, and risk adverse behaviour may also play against revision of the established system.

S3 are not confined to some specific policy areas: all areas, all types of instruments may be mobilized provided that they can contribute to the overall “transformative” goal of the policy. This requires synergies and integration in policy-making process. An effective policy mix includes instruments that have the highest leverage effects on the regional development trajectory. According to the selected areas, such instruments might relate to human capital development, infrastructure provision, investments in public science, regulatory barriers in health or environment sectors, etc. This is to say that a good policy mix needs to be *integrated*, calling on various tools managed by different ministries and agencies. The challenge here lies in the achievement of dialogue, synergies and complementarities between authorities and agencies from various policy domains.

Open questions are present in Smart Specialisation Strategies with respect to this integrated policy challenge:

- How to ensure a good articulation between S3 vision and policy mix (re-)definition?
- How to organize complementarities between policy instruments from different policy areas? How to transfer good practices across sectors?
- On which basis to decide revision / new creation / suppression of policy instruments?
- What part of the policy mix should be geared towards the priorities, what part should remain generic?

### **The smart policy-making challenge**

Many of the above questions, under the “prioritization” and “integrated policy” challenges, imply a response in terms of “smart policy-making”. This can be defined as fact- and analysis-driven timely decision-taking, flexibility in switching to emerging opportunities, joined-up policy making, and learning-based decision-taking processes. The requirement for tailor-made policies and the stress on effectiveness of S3 means that a lot of policy intelligence, and new policy skills need to be put into the process.

Prioritizing and redefining smart specialisation domains and policy mixes are hard decisions because they change the equilibrium of power between actors. Such politically difficult decisions, if they are to be translated into concrete implementation, need to be founded on well-grounded justifications. These justifications can be constructed based on a combination of studies, individual actor’s consultation, wider debates, international benchmarking, evaluation results, etc. Knowledge gained from those sources need to be engineered at some point and turned into decisions. This is very demanding in terms of capacities on the side of policy-makers, which are likely to face contradictory pressures from vested interest groups, and a large degree of uncertainty with respect to evolution of competitive advantages of the region.

Smart policy-making requires the establishment of sound monitoring and evaluation practices and tools, which are well connected to the decision-making process. Assigning clear and measurable goals to all elements of the policy mix, measuring results against expected benefits, translating individual results into overall indicators, addressing the selection bias problem in all evaluations, revising instruments according to impact evaluation results, those are all desirable elements of smart policy-making that need to be part of a Smart Specialisation Strategy. This is an essential foundation, on which to check the effectiveness of S3-related policy mixes, and on the basis of which to revise the Strategy periodically.

However, there is a long way from this ideal situation and practice. Many of the aspects of S3 do not lead themselves to obvious measurement tools. Several dimensions can be measured, require different databases and tools, and reflect an increasing degree of difficulty: i) the conditions that are likely to lead to knowledge spillovers between domains; ii) the entrepreneurial acts themselves that generate knowledge spillovers; or iii) the impacts of these actions on regional economies.

Today many questions remain open in the practice of Smart Specialisation Strategy design and implementation:

- How to assess joint effects of policies, beyond the effect of individual instruments? Which performance and output metrics are appropriate in this context?
- How to track progress during implementation? What are the benefits/weaknesses of a Scorecard approach?

- Who should be involved in all parts of the monitoring and evaluation chain? What potential role for external assessors?
- How to overcome policy lock-in? How to assess efforts to overcome policy lock-in?
- How to ensure that the costs of policy management do not outweigh the benefits?

### **The “multi-level governance” challenge**

A policy mix for Smart Specialisation includes a combination of policies originating from the local, regional, national and EU levels. Often, a policy mix is not identified as a multi-level arrangement of policies: policies from different authorities are often running in parallel and interactions are not necessarily monitored and understood. In regions with average institutional powers, regional decisions and priorities may conflict with national priorities and the resulting policy mix may include contradictory elements. In regions with limited institutional powers, developing an S3 requires a capacity to benefit from, and influence, national policies relevant for the strategy.

The multi-level governance challenge for S3 raises several questions in practice:

- What is the room for manoeuvre of regions when the bulk of instruments emanate from the national level, where are the best leverage points for the region?
- How to maximise synergies and minimise duplications or contradictions between policy instruments from various levels?
- Which instruments are best run at local, regional, national or EU levels?

### **The “cross-border” challenge**

Innovation, value chains, cooperation and knowledge flows do not stop at administrative borders. Administrative boundaries create regions that are too restrictive for some types of interactions, while they might be too large for other. Faced with this reality, regional policies and Smart Specialisation Strategies tend to stop at regional boundaries because policy-makers are accountable to their electorate located within such boundaries. The S3 calls for the identification of internationally competitive smart specialisation areas, i.e. original combinations of complementary activities which are likely to cross over regional borders. It could even be argued that crossing the administrative borders is an essential element for those strategies that aim to unlock regional potential from past trajectories. Hence this trans-border element is an integral part of the S3 approach. The challenge here lies in defining functional regions according to firm dynamics and knowledge flows space, rather than according to political boundaries.

The open questions for the cross-border challenge in S3 are:

- How to cope with functional areas as the appropriate territorial units while at the same time respecting territorial remit of regional institutions?
- How to organize alignment of policy instruments across border regions?
- How to solve the problems linked with joint cross-border funding of organizations or programmes, how to ensure the mutual benefit?

### **The stakeholders engagement challenge**

Engaging stakeholders, i.e. actors which are affected by policy choices and make decisions that are critical for the ultimate impact of these policies but are not policy-makers themselves, in a Smart Specialisation Strategy process, brings several types of benefits spanning all the steps of the S3 policy-making process:

- Information-gathering: in most cases, a situation of imperfect information holds, where policy-makers do not possess all information that is relevant to base their decision. Involving stakeholders is a means to collect distributed information that is not readily available;
- Goals endorsement: when stakeholders are associated with the formulation of policy goals, the likelihood that the latter are well understood and endorsed by them increases;
- Alignment of strategies: stakeholders involvement helps to align their agendas with the overall policy goals, both at strategic and at operational levels, and also between the variety of stakeholders;
- Trust building: integrating stakeholders into the policy-making cycle helps improve communication and mutual understanding between them and policy-makers. This helps create a climate of trust, which is needed notably to carry out the monitoring and evaluation functions effectively.

The range of stakeholders to be involved is potentially very wide. Typically, the focus is on the Triple Helix members (see Chapter 1) but the role of other potential stakeholders like users, financial

institutions, or the media should not be neglected. The stakeholders also differ depending on the focus on existing vs. emerging domain of activities. For existing domains, this hints at a government policy that is open to all coalitions of entrepreneurial actors that get together to upgrade their domain and propose a strategy for how to do this (vs. government selecting domains, even if it is based on economic analysis). For emerging clusters, where stakeholders are less numerous and/or not known, the goal is for government to encourage entrepreneurial actors to explore new market opportunities (and nurture growth where it materializes/cut support if it doesn't).

The open questions for the stakeholders engagement challenge in S3 are:

- Who to involve and how to select a manageable number of stakeholders for close engagement in the S3 process? What would be the exclusion criteria?
- How to avoid the capture of S3 by vested interests?
- How to engage companies, especially SMEs, who typically do not have time to devote to policy development?
- How to get regular feedback from stakeholders without causing “engagement fatigue”?

### 1.2.3. Clusters and cluster policies: the challenges of practice

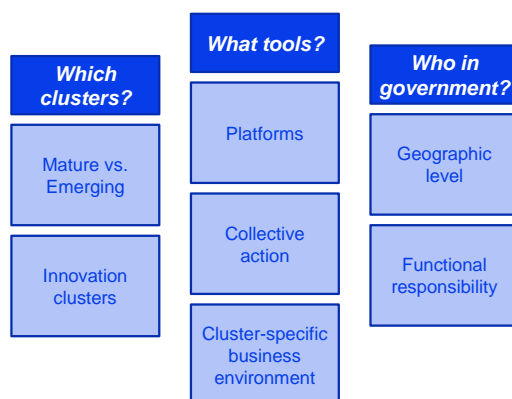
Cluster policies have in the last two decades grown from an experimental policy instrument used by few ‘innovators’ into a popular tool for economic development, especially at the regional level. Cluster policies have been subject to extensive review (Hospers *et al.* 2008; Peck and Lloyd 2008; Müller *et al.* 2012; Uyarra and Ramlogan 2012; Ketels 2013b). This section takes stock of this experience. The focus is less on the academic debate and more on the lessons learned from the large variety of cluster policies, to nurture the proposals in the next section on how current cluster policy practice can be effectively used in Smart Specialisation Strategies.

For policy makers to make use of the experience of cluster policies when designing their Smart Specialisation Strategies, they need to understand this heterogeneity. This section first provides an overview of this variety, seen along several dimensions (targets, tools, level of government involved). It goes on to characterize five typical cluster programs implemented in Europe based on these dimensions. The strengths and weaknesses of these policies are then put in evidence. Finally, the way forward is discussed: how to improve cluster policies based on general lessons from good practice, and how to adapt policies to stages of cluster development and to stages of regional development. This will form the framework for “good” cluster policies, whose role in Smart Specialisation Strategies is discussed in the next section.

### Key dimensions of cluster policies

Cluster policy is, in the public debate, often used as if there was a generally agreed definition of the term, describing a homogenous set of actual public interventions. The empirical evidence is, however, quite different: different regions and countries have given different answers as to what cluster policies are what they should achieve. The variety of cluster policies is related (at least) to differences in who they target, what instruments they use, and who in government has launched them (Figure 1).

Figure 1. Key dimensions of cluster policies



## **Targets of cluster policies**

The target of cluster policies is what most clearly differentiates them from other types of economic development policies: the focus is on *improving the competitiveness and economic performance* of a specific cluster or group of clusters as a regional agglomeration of economic activities in related fields - not an individual firm, a specific industry, a broad sector, or the entire regional economy. At an operational level, cluster policy then needs to make a choice about what type of clusters it wants to target and how it wants to implement this objective in a selection process.

In terms of the type of clusters to target, the *existing strength* of a regional cluster is the criterion applied most frequently. Many programs focus on leading clusters. These are regional clusters that have achieved market success at the national or global level, are areas in which a region has relatively strong presence compared to other locations, or at least have a dominant role in the regional economy in terms of jobs and economic activity. There is a smaller number of programs that instead look for clusters that seem to be *emerging*. These are regional clusters that have not reached the benchmarks outlined before but register strong growth or have other assets that make such growth seem likely to occur in the future. While the previous two approaches are used in cluster programs open to all types of economic activities, a number of programs are more narrowly targeted at specific sectors or 'cluster categories'. These cluster categories are selected because they are perceived to have general characteristics that make them attractive for public interventions. Candidates are clusters that are research-intensive, high-wage, or serving markets that are considered to be growing and addressing so-called 'grand challenges'. Among all clusters within the targeted cluster category it is again either existing strength or perceived potential that are used to make the final selection.

A wide variety of procedural approaches has emerged to facilitate decisions on targeting particular clusters and these procedures are often embedded in program design. Competitions have become more frequent over time, while in the past the focus was on specific conditions that defined eligibility for funding. The selection is sometimes done by external expert groups, sometimes by public officials. The specific criteria used to assess cluster efforts based on the programs' objectives also differ widely. Key areas frequently considered in the evaluation are the existing size and economic performance of the cluster, the quality of the cluster-specific business environment, the strength of the cluster organization, and the coherence of the cluster organization's strategy and action plan.

## **Tools used by cluster policies**

The tools used by cluster policies are a mix of new instruments, and of existing instruments that are now directed at clusters. This observation already highlights that cluster policy does not so much provide a different type of economic development toolkit. It is largely a different way to use and apply existing tools with a view to making them more effective: policy mixes for clusters can be seen as "clusters of policies" rather than "cluster policies" (Nauwelaers and Wintjes 2008). The many different instruments used by cluster policies can be organized into three main groups:

1. Supporting platforms or cluster initiative organizations. Funding is provided to a secretariat that organizes activities to connect the organizations in the cluster, provides information about markets or relevant government programs, and markets the cluster externally. The necessary budgets for this type of support are often relatively limited, covering operational expenses as well as staff costs. This is a set of tools most unique to cluster policies. This category reflects the idea of some governments that policy intervention should be limited to providing impulses and playing a catalytic role, rather than being a driver or putting important resources in the clusters;
2. Supporting collaborative actions. Funding is provided for specific joint actions by organizations in the cluster, for example a joint R&D effort or the development of a collaborative educational program. These types of activities tend to require more substantial budgets and are almost always designed to include significant co-funding by the companies and research institutions themselves. This is a set of tools that largely exists but where the cluster approach reframes the level at which the government action is applied;
3. Upgrading the cluster-specific business environment. Funding is directed to enhance specific dimensions of the business environment, for example a research institute or a workforce-development program focused on a specific cluster. Budgets are again often substantial and in this case the government tends to cover the entire expense. This, too, is a set of tools that exists but where the cluster approach changes the context in which government integrates policies and looks at their impact.

## **Government actors involved in cluster policies**

Cluster policies have been launched by many *different parts of government*. The level and part of government designing the cluster policy often has a significant impact on the selection mechanisms and the support tools used.

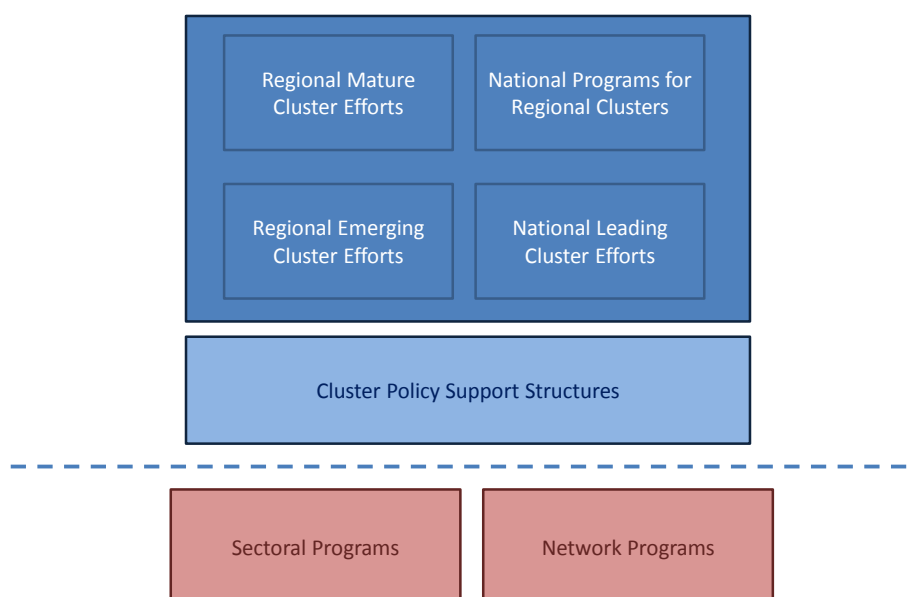
At the geographic level, local authorities, subnational regions, countries, macro-regions, and the EU have all launched programs focused on clusters. The formal powers and actual capabilities that specifically subnational regions are able to draw on in their cluster efforts vary significantly across Europe. Federal systems like Germany, Italy, and Spain have strong regional governments, with significant financial resources and political authority. France and in particular the UK have in functional terms significant economic regions as well but have a much more centralized government structure. Smaller EU member countries tend to have regions that are economically as well as politically less powerful, with urban centers being the key subnational actors.

In terms of functional differences, agencies and ministries for innovation, regional policy, and industry/SME development have all been active in cluster policy. Their broader responsibilities and traditional policy instruments have often a strong influence on how they approach cluster policy.

## **Typical cluster policies in Europe**

The cluster policies that are currently used in Europe cover a wide spectrum within the dimensions discussed above. Over time, a number of types of policies have emerged that reflect different choices on key dimensions of cluster policy (Figure 2). While the conceptual categories suggest various options, the reality is often characterized by a more pragmatic application of general principles. The focus of the types chosen is on cluster policies most relevant in the context of Smart Specialisation Strategies.

**Figure 2. Types of Cluster-Related Programs**



## **Regional cluster efforts for established clusters**

Many larger European regions have cluster programs that are directed at those parts of their economy most conducive to generating overall employment or value creation. The specific criteria used to identify the clusters vary significantly, and some programs mix support for mature clusters with high levels of existing economic activity with support for clusters that are at a much earlier stage of their development. They focus their funding on cluster initiatives, either through quasi-public economic development agencies or through the financing of cluster secretariats operated by external service providers or the cluster actors themselves. There is sometimes also limited funding for specific collaborative actions, for example on training or internationalization. But most of these investments are supposed to be financed through other government programs that the cluster platforms created are encouraged to tap into. Examples of this type are: Bayern Innovative, Catalonia cluster program, Wallonia competitiveness poles program.

## **Regional cluster efforts for emerging clusters**

A few European regions have also used cluster programs to support the development of new clusters. In some cases the programs try to strengthen existing but still young clusters, while in others there is very little in terms of an existing economic base. These efforts often combine the investment in public or public-private research entities with the creation of a cluster organization to encourage the emergence of economic activities related to the research. Given their nature, they require more significant funding. Examples of this type are: BioBasque (dedicated effort to build a new cluster), Norway ARENA (focused on more naturally emerging clusters).

## **National programs for regional cluster efforts**

These programs are similar to regional efforts but more selective; there tends to be a national evaluation to decide which cluster organizations should receive support. While the programs finance primarily the management of cluster initiatives, the intention is to use these structures to channel activity-specific support in areas like innovation or SME upgrading. In some countries the focus of these programs is clearly on clusters that have reached critical mass, while in others both mature and emerging clusters are supported. Examples of this type are: Portugal COMPETE, Germany Kompetenznetze, Danish Clusters and Innovation Networks, Norway NCE, Sweden Vinnväxt.

## **National leading cluster competitions**

These programs increase both the level of selectivity and of funding in relation to broader-based national cluster programs. The ambition is to enable leading clusters in the country to compete more successfully on an international scale. There is some funding for cluster initiative management but often a larger amount for specific collaborative actions and cluster-specific business environment investments. These larger funds are either directly part of the program or should become much easier to access given the designation as a leading cluster. Examples of this type are: French Pôle de Compétitivité, Germany Spitzencluster, Hungary Pole Program.

## **Support for cluster programs**

A number of countries have created a support structure for cluster efforts that does provide technical tools and instruments that cluster organizations can use. RegX and RegLab in Denmark, for example, support regional cluster efforts through training and technical advice. The cluster secretariat in North Rhine-Westphalia (Germany) provides similar support across the different cluster efforts launched by the NRW state government. The EU has been particularly active in this area, initiating the European Cluster Observatory, the Cluster Collaboration Platform, the European Cluster Excellence Initiative, and a range of other efforts to raise the quality of cluster efforts and cluster policies.

## **Sectoral and network programmes**

Finally, a number of countries have launched programs that either support networking among groups of companies or develop integrated action agendas for specific sectors or technology fields. These programs share many aspects with cluster programs and sometimes include clusters as partners, but do not have an explicit regional geographic dimension. The Netherlands, for example, have identified priority sectors for their R&D funding activities, and have created collaboration structures to coordinate action within these sectors. Sweden has launched a new national competition for Strategic Innovation Areas (SIA) that has similar features. Countries like Denmark and Finland have created national networks in specific sectors, which have been growing out of clusters that were at the regional level perceived to lack critical mass. The UK has under its Technology Strategy Boards several instruments to support collaboration, focusing either on collaboration between specific project groups of institutions or a national sector. Germany, Italy, and the Netherlands have support programs that tie funding for innovation-oriented activities to the presence of a project-specific consortium of institutions.

### **1.2.3.1. Drawing lessons: What to use, what to improve?**

Should regions use cluster policies at all, and if so, how can they adapt them to achieve the best impact? The debate about the economic benefits derived from cluster policies remains on-going. Individual policies have seen broadly positive evaluations, but there have been failures as well. If there is any clear consensus, it is that outcomes are quite heterogeneous. Here we discuss some of the benefits that cluster policies have achieved, and some of the challenges they have encountered. This is important for the purpose of this report: as argued in Chapter 1, the concept of Smart Specialisation Strategies has emerged from a critique of the way in which previous regional policies

have been designed and delivered and many cluster policies are arguably part of that critique. It is therefore important to highlight the strengths and weaknesses of cluster policies.

#### **1.2.3.2. Benefits of cluster programs**

Cluster programs are ultimately aimed at achieving economic outcomes, e.g. higher wages and employment, increased value added, increased exports, etc. Cluster efforts have an indirect impact on these outcomes, thanks notably to firm creation or increase in innovation rate. They enable governments to upgrade the competitiveness of firms at a particular location, and they help companies to better leverage the assets available in a location.

For *regional governments*, the available assessments point to a range of benefits that cluster policies have delivered. The key to success has been the use of clusters as a tool to engage with a more strategic dialogue with the business community. At the core, cluster programs have helped to create and strengthen the social capital in the region. This has enabled governments to design better policies and in general to align their efforts more with the actual needs of companies. And it has enabled them to become better at attracting and leveraging external funds available through national or EU programs. Importantly, cluster efforts have given regional governments a new strategic role in orchestrating the use of policies in dialogue with the private sector. This has been a significant change relative to the traditional role, where subnational regions were either the executing agencies or smaller, much less powerful versions of national government. In this context, clusters have also provided a natural way to leverage synergies between different policy instruments directed at a common cluster target.

For *companies*, there are significant benefits in the easier collaboration with other firms and with academia. Cluster programs reduce transaction costs and enable joint action. This is particularly important for SMEs that lack the resources and capabilities to easily connect with these partners. And these connections drive innovation and business success that otherwise would not have materialized. Another key benefit has been the creation of a platform for dialogue with the public sector that was more effective than the traditional economy-wide or industry-specific fora oriented towards lobbying. However, for SMEs the creation of cluster programs has in some cases also enabled a joint strategy discussion that has led an entire group of companies to change its positioning in the market. For large companies, too, cluster programs provide a useful context to engage with smaller suppliers and service providers. Cluster efforts can focus on the long-term win-win opportunities for joint upgrading, while individual context are often dominated by the competitive rivalry about how to share the benefits created.

#### **1.2.3.3. Weaknesses of cluster programs**

While there are many examples of benefits, there are also examples where cluster programs have had very little impact, wasted public resources, and benefited only a small group of companies and research institutions. The following list collects some of the most common mistakes and the negative results they lead to:

- Choose weak clusters and fund only a platform for collaboration: this has little impact because there are few underlying assets and capabilities to mobilize. While the funds per project are often modest, in total this is a meaningful waste of public resource with little benefit.
- Choose emerging clusters based on global market demand or perceived interests of the EU/national level, not based on local assets: this wastes resources by investing them in locations with a low likelihood to succeed in these often highly competitive markets. It also undermines the growth of emerging clusters with real underlying strengths by working against consolidation.
- Failure to offer incentives for the systematic exploration of market opportunities for new clusters given the specific cluster portfolio and business environment conditions in a region: cluster programs are often either too conservative, i.e. fund only existing strong clusters, or take the wrong risks; i.e. support efforts to create clusters where there is no underlying competitiveness or evidence of market success. Entrepreneurs that explore real market opportunities in areas where there is such potential create positive knowledge externalities for other investors. Regions miss an opportunity if they do not provide incentive for such explorative activities.
- Continue to fund weak or emerging clusters despite lack of results: whether public investments can trigger a process that helps weak or emerging clusters to develop inherent competitive strength is in

most cases hard to know in advance. But if public funding is sustain even when performance benchmarks related to real market success are not met, this creates waste and distorts competition.

- Support mature and emerging clusters with the same tools; mature clusters can be identified given their critical mass and their funding requests can be assessed given the strategic assessment of the cluster and its market, they often need targeted investments in joint actions or cluster-specific business environment. Emerging clusters can be identified given the location's existing cluster portfolio, its business environment qualities, and the opportunities on the relevant international market; they often need support to connect new types of actors to explore the market opportunity. A failure to align the selection procedures and support tools with the nature of the cluster distorts incentives and wastes public resources.
- Failure to leverage improvements in the cluster-specific business environment to benefit the wider regional economy: while the presence of strong clusters is an important contributor to healthy regional economies, ultimately the entire regional economy needs to be competitive. Cluster efforts can help but this requires the relevant government programs to include elements that leverage cluster-specific changes to benefit also other companies in the region. If cluster policies do not include these mechanisms and are not embedded in a broader competitiveness strategy, the overall impact on the regional economy will be limited. This is even more the case when the region's low overall competitiveness is also a key reason for the weakness of the existing cluster portfolio.
- Bias the action priorities of cluster organizations by funding joint actions in areas selected by government; cluster organizations, in particular the private sector, are best placed to know which actions are most critical for improving a cluster's competitiveness. If the government across cluster efforts selects specific activities to support, it can easily bias cluster organizations' action agendas. They then do what they get public money for, not what would be the best use of that money.
- Fail to test whether the plans to use the government resources address the key competitive challenges of the cluster; while companies know better what to do, they can also be myopic in their views. Cluster efforts are an important opportunity to challenge the dominant views in local companies, confronting them with data and analysis about the cluster and the market it competes in. This is especially the case when the low sophistication of local businesses, often in a vicious cycle with weak local business environment, is a key challenge for the region.

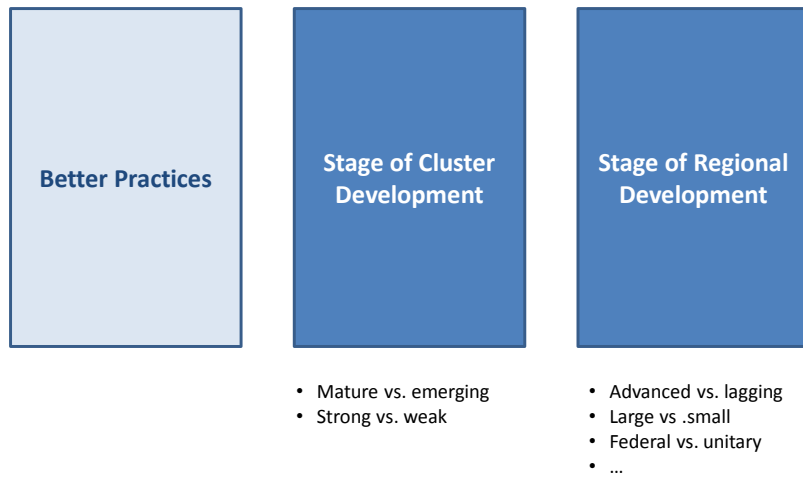
### **Adjusting cluster policies**

Cluster policies need to be adjusted to maximise benefits and minimise drawbacks. The available lessons from cluster policies can be organized in three categories (Figure 3): general better practices across all cluster programs; good practices in aligning cluster policies with the needs of specific clusters depending on their stage of development; and good practices in aligning cluster policies with the needs of specific regions based on their stage of development.

Location-specific factors that matter most are the quality of the regional government agencies, the overall competitiveness of the location, and the strength of its existing cluster portfolio:

- Weak regional governments find it harder to oppose the pressure of local interest groups, and are more likely to follow generic examples of other regions or perceived signals from Brussels in making their choices. They are also less able to provide programs and instruments that meet the specific demands of mature versus emerging clusters (Box 6);
- Locations with lower underlying competitiveness need to focus on creating social capital and other cross-cutting competitive advantages. Cluster efforts can be a helpful process tool to achieve these goals; focusing on the direct economic benefits from strengthening linkages within a cluster is going to have limited impact;
- Locations with weak cluster portfolios need to focus on removing the barriers for cluster emergence and focus on inducing the exploration of market opportunities for emerging clusters; programs for mature clusters find few competitive advantages to leverage.

**Figure 3. Good Cluster Policies: Three Sets of Lessons**



## **Box 6. Smart Specialisation Strategies in Poland and the capacity challenge**

In Poland, the main challenge for developing S3 lies in raising capacity in regional administrations, and changing the policy focus from funds absorption towards augmenting impact of policies.

In Polish regions, the concept of Smart Specialisation Strategy is associated with the “new” generation of upgraded innovation and R&D policies. The strategies for regional development have been mostly adjusted, rather than created, according to the European directives, in a relatively short time. The S3 diagnoses are aligned with the efforts in absorption of the Cohesion Funds at the national and regional level. Directions for Smart Specialisation Strategies are included in the updated Regional Innovation Strategies. These are mainly a collection of projects, financed from Structural Funds, rather than systematic processes of policy making for regional development embedded in the regions. The weak integration of the budget at disposal of regions (Structural Funds and own regional funds) with nationally distributed resources, often causes inconsistency between the strategic documents and operational programs. Smart policies would require a true integration of the efforts and adequate management and organization of the regional administration and stakeholders in setting mechanisms for S3, in order to gain specific conditions and assets for the long term regional growth.

### **General good practices in cluster policies**

Better practices for cluster policies and individual cluster efforts have been the focus of much attention in recent years. The European Commission has supported a range of efforts to define high quality standards for cluster policy in the European Cluster Policy Group and related initiatives. And it has focused on excellence in cluster initiatives through the cluster excellence initiative which has among other things resulted in the benchmarking of cluster initiatives. Groups of countries and practitioners have independently worked together to share their experiences. A Nordic-German-Polish network has developed its recommendations for how ‘the best’ cluster program should look like (Lämmer-Gamp et al. 2011). And there is a range of contributions from international organizations like the OECD (OECD 2007) and individual academic researchers that have contributed to this debate as well (e.g. Sölvell et al. 2003).

Some of the key observations from this work are summarized below (Table 2). A general learning has been that strong performance depends on what cluster initiatives do, how they are organized and governed, and in what broader policy context the cluster initiative operates. Consensus on these general observations has been growing but there remains significant work ahead to develop and implement practical solutions that meet these findings.

**Table 2. Good practice in cluster policies**

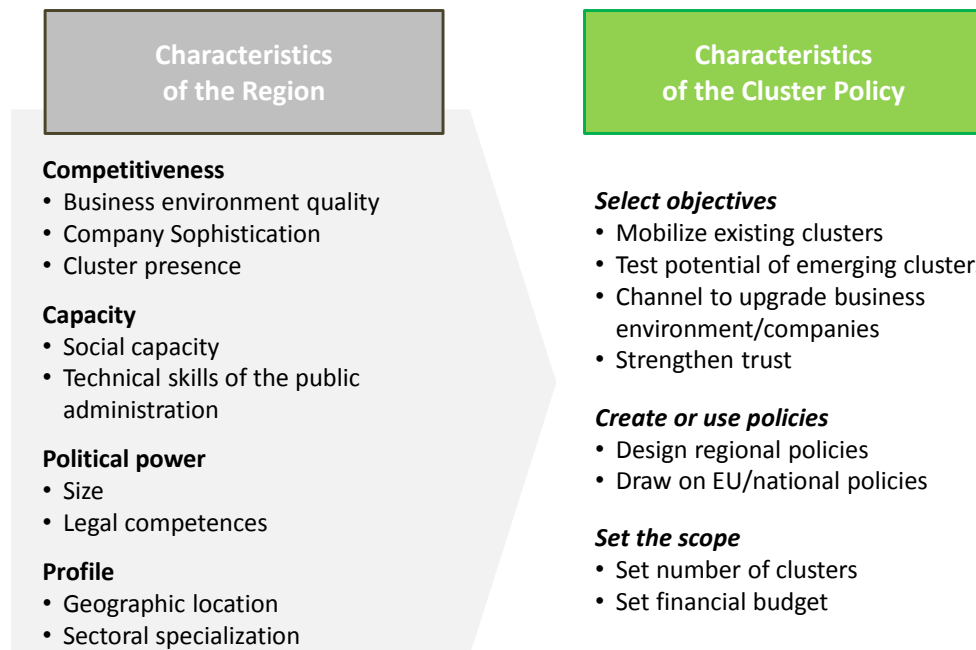
<b>Activities</b>
<ul style="list-style-type: none"><li>• Action agenda addressing the cluster’s specific needs</li><li>• Strengthening local buzz and global pipelines</li><li>• Systematic exploration of opportunities at boundaries of the cluster</li><li>• Systematic tracking of goals, activities, and impact</li></ul>
<b>Organization</b>
<ul style="list-style-type: none"><li>• Businesses in the driving seat</li><li>• Professional cluster management</li><li>• Performance-based funding with a long term orientation</li></ul>
<b>Policy context</b>
<ul style="list-style-type: none"><li>• Cluster policies integrated into a wider regional development strategy</li><li>• Cluster policies aligned to the functional region of the cluster</li><li>• Cluster policies informed by sound evidence base and robust evaluations</li></ul>

### **Adjusting cluster policies to regional potential**

The recent work has largely focused on general standards to ensure better cluster programs. It has done comparatively little to help regions and clusters to choose the specific variations of cluster policies most suited for them. For the successful integration of cluster programs in Smart Specialisation Strategies this will be a critical task. Regions are highly different, and the S3 framework focuses on the need to align policies with specific regional circumstances.

The existing data across European regions shows huge variation between regions not only in terms of economic performance but also in terms of competitiveness, institutional capacity, political power, functional role, and innovation capacity (e.g. Regional Competitiveness Index 2010, Regional Innovation Scoreboard 2012). Depending on the particular profile of a region along these dimensions, different choices about what objectives to set for the cluster program, what policies to use, and what scope to define in terms of size will need to be articulated (Figure 4). For lagging regions, for example, a strengthened focus on improving institutional capacity, using programs offered by the EU or the national government, and a more limited financial investment might be appropriate.

**Figure 4. Adjusting cluster policies to stage of regional development**



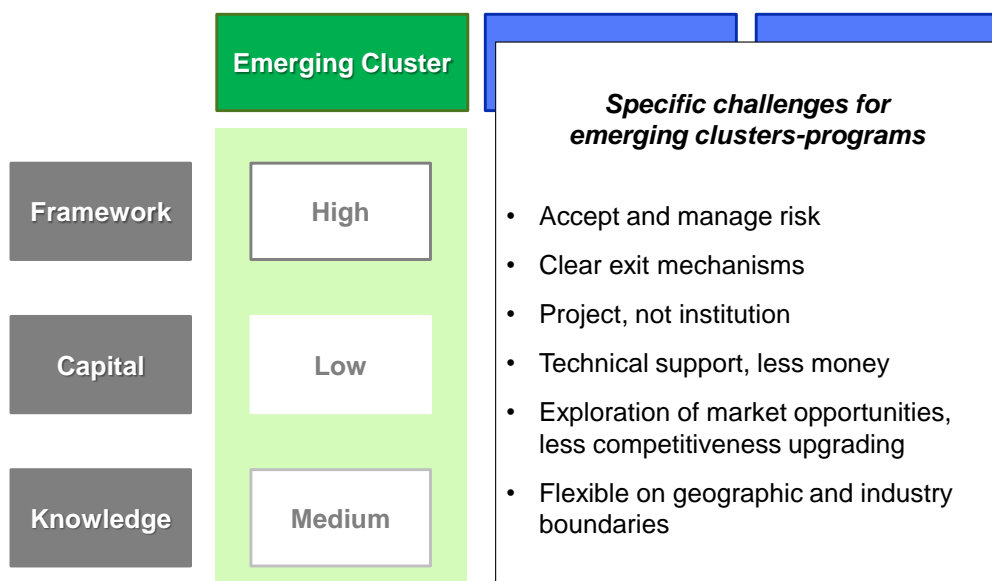
### **Adjusting cluster policies to level of cluster development**

Clusters, too, differ significantly by their stage of development. The S3 framework has a specific focus on emerging clusters, detected through a process of entrepreneurial discovery. With the current cluster efforts most successful with mature, established clusters, this requires in our view a determined push for cluster programs that are aligned with the specific needs of emerging clusters.

Conceptually, the case for cluster policies is much stronger for established clusters that have emerged in the market process than for emerging clusters. Empirically, too, the evidence points towards higher effectiveness of cluster efforts when there is a strong underlying cluster to leverage (Sölvell *et al.* 2003). However, there is a clear need to encourage structural change through the emergence of new clusters. And the positive information externalities from entrepreneurs that show the potential of a new cluster in a given region suggests a role for policy (Hausmann and Rodrik 2003).

This suggests that cluster programs for emerging clusters have a rationale but need to reflect their specific characteristics. Emerging clusters are most likely to mainly require a framework in which a new market can evolve and be explored by entrepreneurs. These entrepreneurs need networks of partners to assemble the necessary elements to move from an idea to an initial product or service to be sold. Large scale investments in specific shared infrastructure are at this stage much less likely to be critical. Cluster programs that address these needs have to manage the higher risk of these efforts, and design clear benchmarks for performance that trigger exit if not met. There are also other dimensions of the program that are likely to differentiate them from many existing programs for established clusters (Figure 5).

**Figure 5. Adjusting cluster policies to stage of Cluster Development**  
**Enabling Entrepreneurial Discovery for emerging clusters**



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#### **1.2.4. The role of cluster policies in Smart Specialisation Strategies**

In Chapter 1 we have discussed how the two concepts of Smart Specialisation Strategy and clusters match each other and enlightened similarities as well as differences in emphasis. In the first sections of this Chapter, we have discussed the challenges facing the policy process of Smart Specialisation (Section 2.2), and the nature and success conditions of cluster policies (Section 2.3). We now turn to the core issue of this report and discuss how the experience with clusters and cluster policies can be beneficial in the policy process of Smart Specialisation Strategies.

The key message is that clusters and cluster policies are for many regions likely to be among the key building blocks in developing and implementing S3. The full potential of clusters and cluster policies will be reached if:

- The Smart Specialisation Strategies integrate cluster policies into a broader transformation agenda for the entire regional economy, and complement cluster policies with other cross-cutting and technology/knowledge domain-specific activities;
- The cluster-based analysis and the type of cluster policies implemented in S3s move beyond the current cluster policy practice, i.e., they need to be adapted to the regional environment, to the level of maturity of the cluster, and they need to comply with a list of good practices rules, including the capacity to address emerging new domains cutting across sectors (see section 2.3).

## **The six potential contributions from clusters and cluster policies to Smart Specialisation Strategies**

The experience from the existing array of cluster policies in Europe provides rich material for regions working on their Smart Specialisation Strategies. Even in their current form, many cluster policies offer useful tools to address key dimensions of S3. Hence, when properly designed and implemented, clusters and cluster policies have the potential to contribute to each of the six challenges outlined above for Smart Specialisation Strategies.

However, this positive stance needs to be adopted with caution: for each of these possible leverage points, there is often a gap between the potential and the reality of cluster policies (because the latter display some weak points), and S3 efforts need to complement cluster policies with other policy action to reach its overall “transformative” goal (Table 3).

**Table 3. The potential of clusters and cluster policies in Smart Specialisation Strategies**

	<b>Potential of cluster policy</b>	<b>Reality of cluster policy</b>	<b>Beyond cluster policy</b>
<b>Prioritization</b>	Clusters are a natural dimension for selection	Lack of tools to identify emerging clusters	Knowledge domains can be different from clusters
<b>Integrated policy</b>	Clusters are naturally suited to organize the design and delivery of integrated policies	Policies often fragmented and focused on single issues	Cross-cutting policies for business environment upgrading needed as well
<b>Smart policy-making</b>	A range of cluster-specific data and analytical tools is available	Limitations in existing cluster data; use of data often ad-hoc	Cross-cutting regional data is needed as well and is only partially available
<b>Multi-level governance</b>	Clusters draw on multiple levels of policy	Limited actual collaboration across levels of government	Important multi-level issues are cross-cluster
<b>Cross-border collaboration</b>	Cluster boundaries are defined by their economic reach	The geographic footprint of cluster organizations is often administratively set	Important cross-border issues are cross-cluster
<b>Stakeholders engagement</b>	Clusters combine critical stakeholders in relevant groups	Cluster initiatives have a key role as bridge builders	Regional engagement structures are needed as well

The most obvious potential of cluster policies is in supporting *prioritization* and *stakeholders engagement*.

Clusters provide a natural dimension for prioritisation and there is ample experience for how to structure and organize the necessary selection processes from existing cluster programs. Where current practice tends to be weaker, is in the selection of emerging clusters that have high potential – here there is arguably a tendency for too much ‘wishful thinking’ and too little systematic analysis of the actual potential for the relevant activities to emerge in a specific location. Also, the S3 approach

suggests that there might be other relevant dimensions for prioritization of activities, for example technology areas or cross-cutting policies. The S3 framework frequently uses the term 'knowledge domains' which suggests yet another dimension.

Cluster organizations have stakeholders engagement as one of their critical tasks; they are supposed to operate as platforms for discussion, knowledge exchange, and joint action across all relevant partners in a cluster. The reality of cluster efforts indicates that this is exactly what successful cluster organizations do well. S3 stakeholder engagement efforts can build on these experiences but need to go further: they need to move towards a regional perspective that moves beyond the interests of individual clusters.

Cluster policies also have a role in other key dimensions of S3 processes. In these areas the realities of cluster policies are somewhat more distant from what is needed: cluster efforts should be a focal point for both *multilevel governance*, i.e. the alignment of policy efforts across levels of government, and *policy integration*, i.e. the alignment of policy efforts across different functional agencies and government ministries. But in practice this is still the exception rather than the rule. Cluster efforts also need to be *evidence-based* both in the selection of clusters and in the design of cluster-specific strategies and action agendas. More data to support evidence-based decision making has been made available over the last few years, but their use in practice is still fragmented and analytical tools to connect data to decisions remain limited. Clusters define their geographic scope by the reach of linkages, creating an impetus for *cross-border collaboration*. But in practice political borders are an important factor in shaping government support for cluster efforts.

In the following sections, we highlight the most promising elements to be drawn from clusters policy experience for the benefit of S3 processes, for each of the six challenges.

#### **1.2.4.1. Prioritization: tools for diagnosis and identification**

The design of Smart Specialisation Strategies relies on a sound assessment of the existing assets of regions, evaluations of major regional strengths and weaknesses, and the identification of bottlenecks of the innovation systems and key challenges both for the economy and society. Such a wide-ranging assessment should not only look at the region itself, but should also make relevant comparisons to other regions, to establish an effective benchmark. As mentioned in Chapter 1, a key point is to establish a distinctive profile of the region rather than copying efforts of other regions.

Identifying suitable areas for smart specialisation in a region has much in common with the identification of target clusters. Regional cluster initiatives frequently begin with taking stock of the region's strengths and weaknesses (Sölvell *et al.* 2003). In fact, identifying strengths and weaknesses of the region is recommended by cluster practitioners as one of the initial steps of cluster initiatives (e.g. Ffowcs-Williams 2012).

The choice of specialisation areas for S3, like the choice of industries on which to focus cluster support, is based on a range of factors including:

- current business strength in the area;
- tradition and history of the area;
- the presence of various supporting activities such as research, education, related government agencies, etc.;
- the conditions for collaboration between different actors.

What is needed in addition for S3 is an identification of the knowledge base which can be exploited in new activity domains. This would help to understand how the clusters that have been identified are situated within - and between - different knowledge domains and the extent to which cluster interventions are likely to lead to knowledge spillovers between these domains.

For cluster initiatives, such choices are often based on a mix of three main methods: mapping of employment patterns and benchmarking against other regions, surveys of perceived areas of strength in the region, and open calls for proposals for funding of collaboration projects. All these methods offer useful inputs for S3, but also present some limitations, as discussed below.

## **Cluster Mapping**

Over the last two decades, interest in clusters has led to the development of a wide range of methodologies for measuring specialisation and agglomeration. Thanks to this, the challenges and pitfalls of such analysis are now well understood and even, partly, solved.

Cluster mapping fundamentally entails assessing statistically in what sectors a region is specialised. It requires data on the sectoral composition of economic activity in the region: usually the number of employees per sector, or the number of firms per sector, or a combination of the two. This data is then compared to the corresponding data for some reference area, such as the whole country or, even better, all of Europe. To identify a region's sectors of high specialisation, the usual procedure is to calculate a so called *location quotient*, which indicates whether or not a sector has a high share of the region's employment compared to the reference area (Porter 2003; Sölvell *et al.* 2008)<sup>4</sup>. This kind of European comparison requires a combination of regional data and European reference data. Such data can be costly to assemble, but the Cluster Observatory provides it free of charge through its website ([www.clusterobservatory.eu](http://www.clusterobservatory.eu)) (see Annex 1).

While this kind of data based on employment statistics facilitates Europe-level benchmarking of specialisation patterns, it has its limitations. Employment statistics comes with a delay of one or two years. For some countries it is only available at less granular industry levels. More importantly from an S3 perspective, data is only available according to the existing industrial classification systems, which are often historically driven and fail to distinguish emerging industries or new activity domains. And, given their nature, such data does not provide any insights about the performance and growth potential, nor about internal and external knowledge flows of the clusters.

## **Cluster surveys**

Cluster mapping based on statistical data is often combined with other more qualitative methods. Clusters and areas of specialisation can be identified through surveys among regional actors. Regional experts, stakeholders or company representatives are requested to list sectors they perceive as regional specialities. The advantage of this method is that it can capture specialisations that are not represented in the official statistics, such as emerging industries or cross-sectoral fields of collaboration. Combined with other methods, it can also contribute towards engagement of key stakeholders.

The method, however, also has limitations. It is sensitive to stakeholder agendas, in that it might reflect how stakeholders would like it to be rather than the actual situation. It will also reflect any skewed perceptions the respondents might have. For example, private sector respondents have been found to have consistently different perceptions from public sector respondents, where the public sector consistently over-estimate the strength of regional clusters and/or the private sector under-estimates it (Teigland and Lindqvist 2007).

## **Open calls for proposals**

Several cluster support programs in Europe are based on open calls where regional collaborative partnerships compete for funding. This selection method has the advantage that evaluation criteria can be adjusted for the particular needs of the region. For example, if a demonstrated ability and desire to collaborate is considered important, it can be given a high weight in the evaluation. Often, genuine involvement of a wide range of actors is apparent already in the proposal. An added bonus of these calls is that sometimes collaboration projects decide to go ahead with some form of collaboration even if they are not awarded the grant they applied for.

For example, the Swedish national clusters support programme, VINNVÄXT, managed by Vinnova, the Swedish Governmental Agency for Innovation Systems, applied a competition model for selecting which regions and sectors to support. The programme was launched in 2001, and has since then

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<sup>4</sup> A location quotient above 1 indicates that a region is specialised in a sector. For example: according to official employment statistics, the Tirol region (in 2009) had about 32,000 employees in the Tourism and Hospitality sector. Compared to all of Europe, this is about 8 times as many as one would expect in a region of Tirol's size. This means that Tirol has a location quotient of 8 for tourism and that Tirol is highly specialised in tourism. In the Textiles sector, however, the Tirol region only has some 500 employees, which is about half of what one would expect from a region of Tirol's size. This gives Tirol a location quotient of about 0.5, which means that Tirol is not specialised in textiles.

concluded three rounds of open calls for proposals. In total, twelve winners have been selected during these calls, and the winners are offered substantial financial support (SEK 10 million per year) for a long period (10 years). Demonstrated active participation from private, public and research sectors has been a key selection criterion in this programme. This is well in line with the requirement for an active bottom-up participation of “entrepreneurial actors” in prioritizing domains of activities for S3.

### **Limits and potential of cluster mapping and selection methods for S3 prioritization**

On the whole, the main limitation of cluster policy experience when it comes to informing S3 policy processes, is that cluster policies are comparatively more focused on existing areas of strength compared to S3, which is comparatively more focused on emerging industries. In addition, knowledge domains are different from industries captured by cluster mapping techniques. And, while open calls can help in detecting knowledge-based, emerging activities that lie at the interface between sectors, the success of this type of method depends on specific features of the programmes (ease of access, bias towards funds attraction, quality of selection procedures, etc.).

To address these and other shortcomings in cluster mapping and selection techniques, several options, used in more advanced cluster policies experiences, are open for policy-makers in charge of S3 design:

- deploying analyses of knowledge linkages between industries: an example of this type of investigation is the study carried out on the clusters in the Swedish region of Skåne, where movements of qualified workers between industries have been computed and used as an indicator to detect proximity in the knowledge bases of different industries (Henning et al. 2010). This resulted in interesting definitions of new activity domains, notably at the interface between the food and life science clusters;
- expanding specialisation analyses based on employment data with similar analyses based on export data (to get indication of the competitiveness of the sectors) and developing such quantitative analyses as trend analyses;
- implementing foresight analyses in order to detect the future potential of the key industries in the region;
- complementing specialisation analyses with analyses of the science, technology and innovation potential and activities in sectors: comparing technology advantages (using patent indicators) and scientific excellence (using publications data) can give some hints on the match or mismatch between scientific and economic potential in a region;
- combining quantitative specialisation patterns analyses with qualitative surveys and consultations of stakeholders in the main industries. In Flanders, for example, efforts to define a sustainable chemistry cluster involved a wide variety of strategic exercises including: i) questionnaires and interviews of the most important stakeholders on the importance of these technologies for Flanders and for themselves, ii) technological workshops on selected topics; iii) SWOT analysis; iv) Road mapping and; v) Consultation-evaluation workshops with different stakeholder groups (large companies, small companies, societal stakeholders) (OECD 2013).

#### **1.2.4.2. Integrated policy: establishing a balanced policy mix**

Effective Smart Specialisation Strategies deploy individual policies and programs in a way that maximises their combined impact on a regional economy. They recognise the multiple linkages that exist between different policy areas as they affect firms’ business environment, behaviour, and performance. An ideal S3 is thus driven by a comprehensive understanding of the needs for upgrading competitiveness in a region, not by the administrative structures through which the respective policies are being deployed.

Cluster organisations provide an environment in which such an integrated policy mix can be designed. The empirical analysis shows that cluster organisations engage in a broad range of activities and that their performance depends on the breadth and alignment of these activities with the needs of the cluster the organisation serves (Sölvell *et al.* 2003). There is no one ‘killer app’ activity that all cluster organisations should focus on, or one recipe of activities that applies equally across all of them.

An effective, integrated policy mix requires four key elements:

- A diagnostic of the current competitiveness and structure of the cluster or region;
- A strategy that builds on the diagnostic to define the cluster’s or region’s value proposition;
- An action plan that translates the strategy into a set of activities that supplement each other in their ultimate impact on firms;
- An *implementation structure* that engages all relevant organisations that control the tools needed to implement the action plan.

These four elements can be found in many active cluster organisations. However, their focus is largely on actions and implementation structures that they control internally or can access from existing government programs. Regional Smart Specialisation Strategies need to go further, covering the entire set of public and private agencies with tools that are relevant for regional competitiveness. And cluster organisations have due to their nature a more narrow scope on the needs of one cluster, while S3 needs to address the broader regional economy.

The reality of regional economic development policies is often driven by a different logic. Individual agencies design their policies and programs based on their own diagnostic of the region or cluster(s) and with an at best limited recognition of activities launched by other parts of government. Cluster organisations with their focus on what they control internally have not been able to break this pattern of policy silos. In fact, their action agendas can be biased by the financing made available by individual government agencies, rather than following the priorities suggested by their own diagnostics and strategy.

The S3 process can draw on the experience of cluster organisations to systematically root the design of individual policies and programs in an overarching regional economic strategy. While the reality of cluster organisations is not an ideal example of how this process should work, it provides useful insights into a strategy-driven process of integrated policy making.

#### **1.2.4.3. Smart policy-making: evaluating the impacts of regional initiatives**

Successful Smart Specialisation Strategies need to continuously react to the information generated in policy programmes and especially the experience of companies engaged in entrepreneurial discovery processes. Prioritisation decisions (see above) need to be not only fact-driven but open to the emergence of new information generated over time. Choices about specific policy tools, too, need to be reviewed given the actual impact they have on target indicators.

Cluster organisations and cluster policies face the same challenges of smart policy-making as S3. Over the last few years, cluster organisations have become generally more professional in their organisation and processes. This has led to the emergence of management information systems for cluster organisations and to the benchmarking of operational practices across cluster organisations (ESCA 2012). While these activities are helpful, they do not yet relate specific operational practices and organisational structures to outcomes that policy makers care about. Cluster policies have been subject to the same type of evaluations as other economic development policies that governments use. However, there is still an inconclusive debate about the results and implications from these assessments (Ketels 2013b). A common pitfall is to judge clusters success on their mere existence, measured through “counting dots” (number of firms, of employees, etc.) (Nauwelaers and Wintjes 2008). What is needed, from an S3 perspective, is an evaluation of *cluster dynamics* in order to detect its possible contribution to the S3 *economic transformation* agenda. This involves an assessment of :

- i) increase in business to business, business to research, research to research, research to community and business to community interactions;
- ii) increase in investment and new leading businesses attracted to the region;
- iii) increased dynamism in firm creation and
- iv) attraction power of the innovation hubs for talents from outside.

In cluster policies, there have been three approaches to the evaluation problem. The first approach, which initially dominated, has been to evaluate not the effect of the policy intervention but other attributes of the intervention itself. Budget spending, the number of activities performed, the number of participating firms, and similar measures are collected and reported as an indication of how well the cluster initiative is performing. The second approach has been to survey participating firms and collect subjective data about how they perceive the effect of the initiative: whether they have experienced increased sales, enhanced innovation, improved collaboration, etc. The third approach has been to collect and track economic statistical data about participating firms, such as number of employees or total turnover. The two latter approaches address at least the intentional effects of the initiative, but they have shortcomings when it comes to separating the effect of the initiative from other coincidental factors, and they usually fail to capture unforeseen effects.

Recently, more advanced evaluation methods have been developed. One such method was applied to evaluate cluster policies in North Mid Sweden, comprising the three regions Dalarna, Gävleborg and Värmland. Twelve cluster organisations were evaluated over the period 2005-2012. The method, developed by the Cluster Observatory, is based on various types of data: official financial accounts from firms, surveys aimed at participating firms and interviews with representatives of participating firms and cluster organisation managers. First, financial data based on official accounting records are analysed. The analysis, called the SIMPLER method, compares the financial performance of firms participating in the cluster initiative with two reference groups: other firms in the same region, and firms in the same industry in a similar region where no cluster initiative is active. Through this

comparison with two benchmarking groups, the financial impact of the policy initiative can be distinguished from other factors. Next, surveys directed at firms participating in the cluster initiative capture other intended effects of the initiative. The financial analysis combined with the surveys thus cover ten key performance variables: competitiveness, value added growth, profitability growth, wage increase per employee, sales increase, new or better products and services, employment increase, workplace equality, workplace diversity and sustainability. Further, another set of performance variables, also covered by the survey, are designed to measure improvements in cooperation and mobility across different actors. Finally, open format interviews with firms and cluster managers are carried out to capture unintended effects, both within the target area (the cluster) and outside it (Sölvell and Williams 2013).

As argued in (Aranguren et al. 2013), a *combination* of empirical and qualitative contextual approaches is crucial for effectively evaluating cluster policies. They have applied such an evaluation on the long-standing cluster policy of the Basque country: the evaluation focuses on the impacts of cluster associations (CA) as the main policy tool deployed in this region. The analysis has two parts. It first undertakes an empirical study to explore the direct effects on firm performance (measured in productivity and productivity growth) of: (1) association membership (which can be related to the policy); and (2) agglomeration (which can be related to firm location decisions based on the importance of external economies). It also includes the driver (3) 'policy targets' for selected priorities defined within the Basque autonomous region (for example, innovation and quality management measured through research and development (R&D) expenditure and International Organization for Standardization (ISO) certifications); and (4) a few standard and observable control variables at the firm level such as the age of the company, employment level and legal status. The results provide some evidence that members of CAs have larger productivity and productivity growth than non-members of CAs. This empirical work is complemented with context-specific knowledge of the policy in question as a means also to include relevant qualitative inputs and outcomes (for example, mutual effects between cluster policy and other business promotion programmes, knowledge spillovers from activities developed by CAs to non-associated firms).

### **Multi-level governance**

Effective Smart Specialisation Strategies need to integrate policy actions vertically, i.e. across different levels of government, not just horizontally, i.e. across different policy fields as discussed above. In part this relates to the parallel actions of different levels of government active in the same policy fields – cluster programs, for example, have been launched by countries, regions, and local governments. But it also relates to the effective connection between those levels of government that provide the financing, often national but also EU sources, and those that implement actions, often regional or local governments.

Clusters policies rely often on a combination of public funding sources, from national and regional levels, but also frequently from EU level, mainly the Structural Funds. The latter is particularly relevant, as the very purpose of clusters fits well with the regional development goals pursued by EU Cohesion policy. Hence, cluster policies are often co-funded by multiple levels of governments for the public part of their funding sources. A substantial share of private co-funding is the best guarantee that cluster initiatives are useful for companies' development, and clusters funding arrangements are often organized so that the public funding share is decreasing over time.

The financial engineering of multiple sources of funding is not easy to achieve, since the different levels may not have aligned their expectations on the results to be expected from cluster initiatives. In the cases where one level dominates the program and the other is just topping-up with its own resources (this is typically the case of national cluster programs with regional co-funding), this alignment is less problematic. In cases where a more genuine partnership is at play, the combination of goals requires a dialogue and the explicit definition of shared rules and targets for cluster funding, ensuring complementarity of the various interventions. For example, France's "Pôles de compétitivité" programme labelled certain clusters of international significance (a priority for the national government) and national significance (a priority for the region).

Mechanisms for coordinating policies between the various levels of authorities need to be put in place. Experiences with innovation policy provide the following lessons (OECD 2011). The most important co-ordination vehicles are actually those that are not always formalized: both consultation processes (formal and customary) as well as ongoing dialogue are key mechanisms. National territorial representatives are another coordination mechanism, especially in countries with a centralized planning approach to regions. Contracts linking the different levels of authorities, including rights and obligations attached to the funding, are among the most commonly used instruments.

## **Collaborating across territorial borders**

Smart Specialisation Strategies are designed for a specific region but have to take account of that region's neighbourhood to be effective. There is clear evidence that a region's neighbours have a significant impact on its economic performance (Dettori *et al.* 2010; Rodríguez-Pose and Crescenzi 2008). This alone suggests that collaborating across regional borders is useful. But there is also a recognition that administrative boundaries often do not coincide with the boundaries of economic regions defined by the intensity of actual economic linkages and spill-overs. This, too, argues for collaboration across borders.

Cluster efforts provide experience from dealing with the same challenge. Cluster boundaries do in general not follow administrative boundaries: cluster linkages benefit from proximity, but in small regions, this can involve crossing a regional or even a national border. However regional policies are often constrained by such administrative boundaries and impede rather than facilitate such cross-border interactions (OECD 2014). The problem arises when member firms want to access public support programmes (such as R&D funding programmes) or benefit from soft support from advisory services, which are usually accessible only to firm located in the region where those policy instruments operate. Cluster firms outside of that region are therefore excluded from this support and it is not possible for private partnerships spanning several regions to access single support sources.

The way forward is given by those cluster programs which cover areas that span across administrative borders, and some of those are even trans-national. A study in 2012 (Walerud and Viachka 2012) identified a number of such organisations in Europe. An interesting example of such cross-border collaboration among neighbours in different countries is the Top Technology region (Germany, Netherlands, Belgium). It includes a cross-border cluster scheme covering and co-funded by the five regions of the cross-border region.

Another form of international collaboration is achieved through networks of cluster organisations: These networks are not necessarily among direct neighbours but instead allow for the exchange of experiences between different independent clusters: 84 such networks were identified in Europe in 2012. All but 12 of these were devoted to a particular sector. Some were networks for a particular kind of organisations (typically networks exclusively for cluster organisations). Others comprised a mix of actors. For example CLUSTERPLAST, a network seeking to address the future challenges for the European polymer converting industry, had 15 partners including local authorities, business entities, cluster organisations and research centres, from 6 European countries.

The experience of the EU Regions of Knowledge program is relevant here: transnational consortia of R&D-driven clusters have been supported by EU funding with the aim to identify joint thematic issues or priorities and develop joint cross-border agendas. It was successful in spurring transnational cooperation between clusters and mutual learning between regional actors involved in clusters and cluster policies (Box 7 and detailed analysis in [Annex 2](#)).

## **Box 7. The Regions of Knowledge EU program: fostering international cooperation between knowledge-based clusters**

Among the EU programmes which have been contributing in FP7 to the smart specialisation drive, the one with the most significant impacts in terms of cluster development, is the Regions of Knowledge Clusters Programme (2007-13), a 126 Million euro initiative which supports regional economic development through consortia of Regional research driven clusters (RRDCs) or a single research-driven cluster having multinational partnership' (including universities, research centres, enterprises and regional authorities). Aimed at enabling regions to strengthen their capacity for investing in economic development and conducting research and technological development activities tailored to contribute to regional economic development, this programme supports the design of research agendas for RRDCs, mentoring and integration activities. In recent years, efforts have been underway to promote a more direct orientation of the RoK in support of smart specialisation.

The 2011 EU-commissioned evaluation of the programme identified a number of results, outcomes and impacts, which the Report qualified as a "non-negligible role" in the smart specialisation of regions. The Report noted that the projects have focused on areas of strategic importance, investing either in the restructuring of an area of traditional strength or an area of future emerging importance for regional economic development. Project work undertaken in developing the state-of-the-art analysis, strategic agendas and joint action plans has contributed to the development of sectoral regional innovation strategies, thus moving the region a step further in terms of smart specialisation. The extent of the impacts has still to be determined, however, the projects are reported to have made significant contributions in terms of mutual learning, transnational and cross-border collaborative links between RRDCs, knowledge transfer and skills and capacities development for cluster management and strategy design and implementation.

Source: Bruno et al. (2011)

### **1.2.4.4. Engaging stakeholders through cluster organisations**

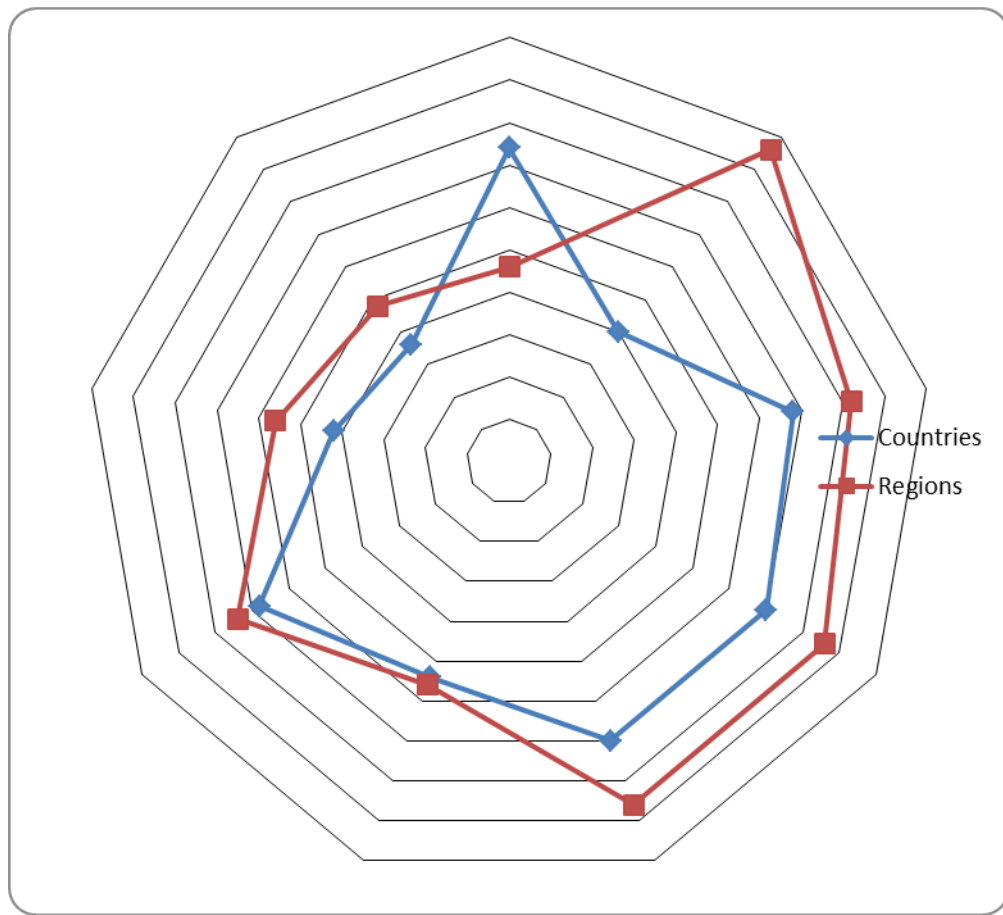
Smart Specialisation Strategies need to be designed and implemented through a broad coalition of relevant stakeholders from the private and the public sector. They all contribute different aspects of the necessary intelligence about the region, and they are all necessary as actors to implement actions. Importantly, many of the relevant actions cannot be administratively imposed; they are based on the free decision on independent organisations based on their assessment of the existing context, the expectations they have formed about what others will do, and their view about what implications specific actions will have for them.

Cluster organisations provide an environment in which exactly the same type of consensual collaboration is being practiced. Participation is entirely voluntary, and a lot of the impact depends not just on what activities the cluster organisation itself pursues but whether it creates an environment in which stakeholders trust each other and form a shared view about the current situation and the direction to take together. Cluster initiatives play an important role in the engagement of relevant stakeholders, and recent research has focused on the impact of the cluster manager and specific organisational designs on the success of cluster efforts (e.g. Bruun Ingstrup 2013; Lindqvist and Sölvell 2011; Sölvell *et al.* 2003). Interestingly, the assessment of cluster initiatives often points towards the creation of trust and a shared understanding of the needs of the cluster as some of their more important positive outcomes.

Regional strategy approaches such as S3 increase the complexity of the stakeholder engagement process. Stakeholders are more numerous, more heterogeneous and more likely to have conflicting interests. Especially the process of prioritization (see above), whether across clusters or other dimensions, requires the management of competing interests to focus policy interest and funding on a narrow set of areas. This is only possible if there is a high level of trust among the stakeholders. Uniting a wide range of diverse stakeholders around a common strategy puts high demands on the S3 governance structure. Current experience points to the difficulty of mobilising the diversity of private and public stakeholders (Figure 6).

Existing cluster efforts can be used as the nucleus of a regional stakeholder engagement process. They are often more private-sector and action focused than other policy dialogue instruments. And they provide a platform where there is an existing level of trust among the engaged stakeholders. The challenge is to transform the role of the public sector from a source of funding to an active partner, and to ensure that the new regional platform is committed to the broad interests of the entire region, not just the entrenched interests of the existing strong clusters. This makes it particularly important to find a way to reflect the voice of the 'not-yet-existing' emerging activities in the stakeholder dialogue.

**Figure 6. Stakeholders involved in S3**



**Source: OECD 2013**

## Chapter 3: Conclusions and Recommendations

### 1.2.5. Policy Conclusions

Clusters provide a conceptual framework to describe and analyze important aspects of modern economies. The arguments developed in this document lead to the conclusion that cluster theories and the interventions to develop them can be regarded as fully compatible with the conceptual underpinnings of the S3 approach, which is a programmatic framework to guide policy. Clusters and S3 share many similarities in their rationale. They are both concerned with fostering regions' competitiveness by leveraging economic potential from a critical mass of key interacting actors and specific place-based assets. There are differences however: in particular, S3 is not only concerned about the innovativeness of interconnected groups of firms but also in the relationship between specific entrepreneurial acts and the extent to which these represent spillovers between different knowledge domains. For this reason, S3 is very interested in emerging linkages between economic activities that can cut across traditional cluster boundaries.

Smart Specialisation Strategies have proved hard to design and implement partly because policymakers and practitioners have been used to fairly prescriptive policy agendas in the past. S3, however, focuses on improvements in policy processes and prioritisation without pre-determined activities or outcomes. The lessons learned from the rather long history of cluster policies can provide concrete inputs into the development of Smart Specialisation Strategies.

Cluster policies present a good potential to become an essential part of S3 for pretty much any region in Europe. When effective, these policies can provide a central toolkit to engage with and develop sectors of the economy in which a region has a significant position. They have the ability to guide the concentration and integration of economic policies on specific areas of the economy. And they can help avoid the pitfalls of the traditional industrial policies, which often used tools that limited competition and thus ultimately competitiveness, and engaged narrow industries rather than broader groups of suppliers, service providers, and end producers engaged in the co-creation of economic value.

The potential contributions of cluster policies' experience into the design and implementation of S3 are found in the six areas which represent key challenges for S3:

1. **Prioritization:** methods to identify domains of smart specialisation can benefit from quantitative and qualitative approaches used in cluster identification and selection (taking into account their limits, notably to identify new domains for application of knowledge crossing traditional industry boundaries) and roadmaps defined by clusters can be used as inputs into the prioritization process;
2. **Integrated policy mix:** S3 involves the design of a smart policy mix, i.e. the effective combination of policy instruments across different policy areas that target the market or system failures in the specific activity domains. The diversity in cluster policies implies diversity in their potential contributions to S3 policy mixes. At one extreme, cluster policies which are limited to funding light catalytic actions (e.g. cluster animation cells) may be of support to the S3 process in terms of prioritization and endorsement, but not so much for the design of integrated policy mixes; at the other extremes, cluster policies that consist of orienting a wide range of policy instruments from different policy domains towards clusters' needs, may come closer to full S3 policy mixes;
3. **Smart, evidence-based policy-making:** lessons from cluster evaluations can be used to fine-tune policy portfolios. Even if the availability of robust and impact-oriented evaluations are still limited, the newer methods at play, focusing on cluster dynamics and trends, are potential inputs for iterative Smart Specialisation Strategies, which need to periodically revise strategic choices and policy mixes to support to domains elected for smart specialisation;
4. **Multi-level governance:** cluster policies are amongst the policy instruments that play most often on sources of funding from different origins. With respect to public funding it is crucial to achieve synergies, rather than duplications between the various sources, and to align goals pursued by the various authorities. Some clusters have gone a long way in experiencing good articulation of diverse sources of public funding, and these lessons can inform S3.
5. **Cross-border dimension:** reinforcing the international dimension of the clusters and the domains of smart specialisation is a most pressing challenge: Europe clusters of worldwide excellence rather than sub-critical, inward-looking initiatives. Internationally competitive S3 domains are unlikely to correspond to regional boundaries: S3 requires trans-border strategies, building on complementarities. The lessons from clusters and cluster policies which have escaped this inward-looking stance can be used to address this challenge in S3. The lessons from the EU Regions of

Knowledge programme, with its strong transnational dimension, are useful to address this challenge: internationally-relevant roadmaps provided by some Regions of Knowledge projects may be used as building blocks for the definition of S3 domains;

6. Stakeholders involvement: strategies to involve stakeholders in all phases of the S3 policy cycle, in order to ensure a bottom-up design and implementation of S3, wide and deep endorsement of the strategy, and its visibility to the outside world, can rely on existing platforms established in the context of clusters and cluster policies, and on "regional champions" associated to the clusters. Strategies to avoid the capture by vested interests are critical for the success of S3.

For cluster as an analytical approach and cluster policies as an active government intervention to provide effective support to S3s, several critical aspects need to be kept in mind.

First, appropriate cluster policies differ by the stage of cluster development:

- For mature clusters, cluster policies can play an important role in leveraging the existing capabilities of a regional economy through enhancing collaboration within the cluster. They can increase the impact of government policies by coordinating different policy tools and instruments from the perspective of the economic activities that they aim to support. Mature clusters can also be involved in entrepreneurial discovery. S3 could focus on how such clusters transect different knowledge domains;
- For emerging clusters, cluster policies play a key role in enabling the entrepreneurial discovery process through which (groups of) firms and research organizations explore the potential of new clusters in a specific region. The cluster organizations to pursue these are more project-based, and less defined by existing geographic and industry boundaries. The cluster policies to support them need to be oriented towards providing technical and process support to bring these organizations together. And they need to promise less money and, importantly, clear benchmarks to be met for funding to continue.

Second, appropriate cluster policies differ by the overall level of regional competitiveness:

- In advanced regions, government agencies tend to be trusted, social capital is high, and the general business environment does provide an environment in which clusters naturally emerge. Cluster policies can then be more focused on leveraging the economic benefits from these clusters through enhancing collaboration, and on using clusters as an organizing principle for other economic policies;
- In lagging regions, government tends to be less well resourced, less informed, less cohesive. This weakens their capability to design and implement policies, and make them more vulnerable to the pressure of interest groups that try to use cluster policies to gain specific benefits. Social capital tends to be lower, and with it the willingness and capability for collective action. A weaker business environment leads to overall weaker economic performance, and often also inhibits the emergence of strong clusters.

Third, the general lessons of good practice in implementing clusters and cluster policies include:

- Businesses are in the driving seat;
- Innovation (technology-based or not) dimension is at the core of the clusters;
- Cluster management is professional and effective;
- Activities deployed are well in line with the cluster's specific needs;
- These cultivate both the local buzz and the global pipelines;
- Cluster policies are aligned to the functional region of the cluster;
- Funding system promotes both private sector involvement, sustainability and performance;
- Cluster policies are integrated into a wide regional development strategy;
- Cluster policies are informed by a sound evidence base, systematic monitoring of activities in line with goals, and robust evaluations;
- Authorities in charge have the strategic capacity to run such demanding policies (there are no best practices, only policies that are fine-tuned to the specific characteristics of the targeted regions and clusters).

Lastly, and most importantly, cluster policies cannot be equated to S3: the former policies are among the possible policy tools in a S3 policy mix, but Smart Specialisation Strategies have a broader remit. Clusters efforts need to be embedded into a broader economic strategy that develops the clusters portfolio over time, enhances the general business environment to benefit all firms, and integrates cluster-specific and cross-cutting activities into a coherent overall value proposition for the location. In

cases where regions/countries already use cluster policies, the move towards S3 requires two tasks from policy-makers:

- Revise the focus areas: verify which clusters are to be retained (or developed) following the application of the principles of Smart Specialisation. This could include, for instance, the outcome of regional consultations with a wide range of stakeholders on priorities alongside analysis of regional knowledge assets and the way that these cut across sectors, clusters and technologies. The goal is to achieve a coverage of those domains that together represent a sufficient critical mass of growth-oriented activities, with the potential to drive the economy towards sustainable jobs and value-added in activities which are competitive on the international scale;
- Define an integrated strategy: complement the “vertical” policies (including cluster policies) towards the identified knowledge domains, with horizontal policies to ensure that good framework conditions and incentives are in place to help the S3 domains thrive. The latter include elements of science and research policy, education and training, economic policy, entrepreneurship, etc.

A last note of caution regarding the dangers of using clusters in S3 is needed: this relates to the path-dependency and inertia problem. The existence of clusters and cluster policies in a region may be a hindrance to develop S3, since there is likely to be a degree of inertia, impeding the shift towards new, less traditional but more promising specialisation areas, crossing over the traditional sector boundaries along which many clusters are defined. When there is no exit strategy for cluster policies, this can also cause lock-in effects, detrimental to the S3 process. The strong voice given to existing cluster incumbents may constitute a blocking factor for a wider search for priorities in other domains, where stakeholders are less easily identified and/or have a weaker voice in the system

#### **1.2.6. THE ROLE OF EUROPEAN POLICIES**

There is a role for EU level support for cluster policies with a view to reinforcing their effectiveness and their potential contribution to Smart Specialisation Strategies. This can be done along several lines:

- Promote trans-regional learning on cluster policies: on this aspect, the benefits from programmes such as the Regions of Knowledge and efforts like TACTICS and the High Level Advisory Group on Cluster Policy should be further capitalised upon. Drawing lessons from cross-border experiences in cluster initiatives should receive important attention in future EU programmes. European-wide benchmarking of clusters and cluster policies should put more emphasis on promoting a diversity of cluster policy tools that are adapted to different types of clusters/regions;
- Expand the development of a data infrastructure on clusters and cluster policies, with new emphasis on more advanced mapping indicators and on tools, methods and findings from evaluations of cluster policies. The specific case of emerging clusters deserves a particular effort due to current weaknesses in measurement tools;
- Improve the use of the Territorial Cooperation Programme for the development of cross-border cluster efforts, placing the focus on genuine cross-border initiatives and policies (rather than mere alignment of cluster programmes).



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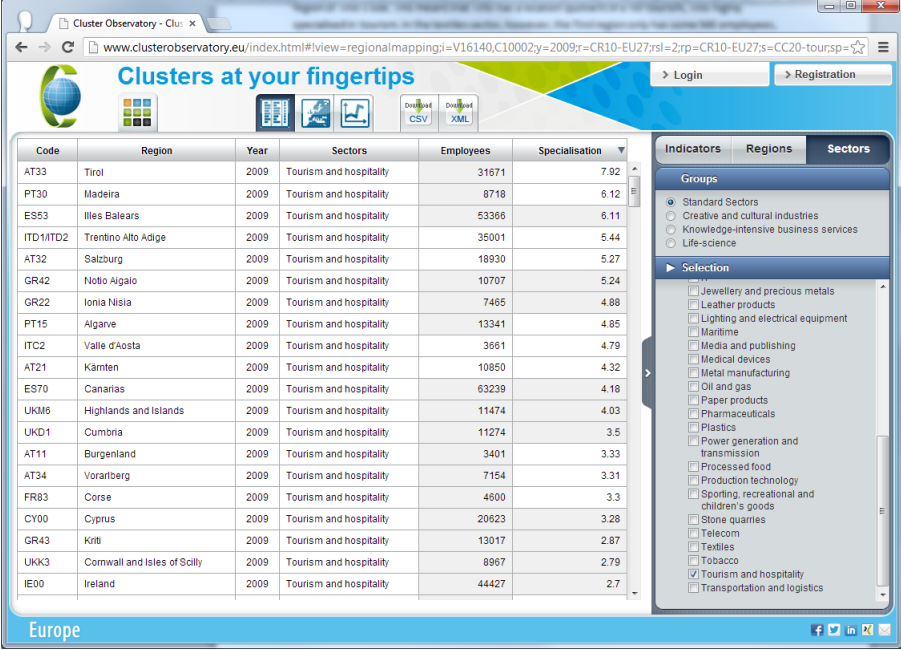
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## Annex 1

### The Cluster Observatory

The Cluster Observatory is a data and analysis service for clusters and cluster policy in Europe. It provides, free of charge, data on the sectoral composition of employment, including data on the relative specialisation of a particular sector in a particular region. Currently, the Observatory provides specialisation data for 56 sectors in 404 regions in 36 countries. Data can be viewed on-screen or downloaded by the user. The data presented is based on official employment statistics obtained from national statistical agencies.



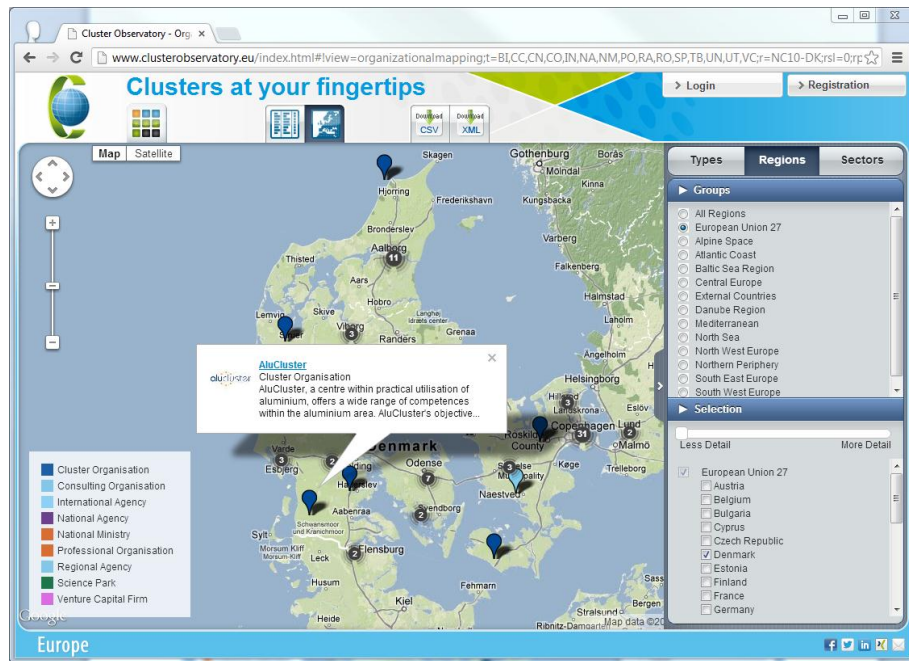
The screenshot shows the Cluster Observatory website interface. The main content area displays a table with the following data:

Code	Region	Year	Sectors	Employees	Specialisation
AT33	Tirol	2009	Tourism and hospitality	31671	7.92
PT30	Madeira	2009	Tourism and hospitality	8718	6.12
ES53	Illes Balears	2009	Tourism and hospitality	53366	6.11
ITD1ITD2	Trentino Alto Adige	2009	Tourism and hospitality	35001	5.44
AT32	Salzburg	2009	Tourism and hospitality	18930	5.27
GR42	Nofio Algaio	2009	Tourism and hospitality	10707	5.24
GR22	Ionis Nisia	2009	Tourism and hospitality	7465	4.88
PT15	Algarve	2009	Tourism and hospitality	13341	4.85
ITC2	Valle d'Aosta	2009	Tourism and hospitality	3661	4.79
AT21	Kärnten	2009	Tourism and hospitality	10850	4.32
ES70	Canarias	2009	Tourism and hospitality	63239	4.18
UKM6	Highlands and Islands	2009	Tourism and hospitality	11474	4.03
UKD1	Cumbria	2009	Tourism and hospitality	11274	3.5
AT11	Burgenland	2009	Tourism and hospitality	3401	3.33
AT34	Vorarlberg	2009	Tourism and hospitality	7154	3.31
FR83	Corse	2009	Tourism and hospitality	4600	3.3
CY00	Cyprus	2009	Tourism and hospitality	20623	3.28
GR43	Kriti	2009	Tourism and hospitality	13017	2.87
UKK3	Corwall and Isles of Scilly	2009	Tourism and hospitality	8967	2.79
IE00	Ireland	2009	Tourism and hospitality	44427	2.7

The sidebar on the right contains filters for 'Indicators', 'Regions', and 'Sectors'. Under 'Sectors', there is a 'Groups' section with radio buttons for 'Standard Sectors', 'Creative and cultural industries', 'Knowledge-intensive business services', and 'Life-science'. Below this is a 'Selection' section with a list of sectors and checkboxes. The 'Tourism and hospitality' checkbox is checked.

The Observatory can also, at a low cost, provide sectoral data on a more granular level tailor-made according to the needs of a particular region.

The Cluster Observatory also provides, region by region and sector by sector, a database of more than 1,400 cluster organisations and over 1,600 other organisations playing important roles for economic development (such as development agencies, universities, venture capitalists, science parks, etc.). It can be used to identify organisations for collaboration in the own region and potential collaboration/benchmarking partners in other regions.



Another website, the European Cluster Collaboration Platform ([www.clustercollaboration.eu](http://www.clustercollaboration.eu)) provides a convenient tool for international collaboration between cluster organisations.



## **1.4. Annex 2**

### **The EU Regions of Knowledge programme and Smart Specialisation Strategies**

Among the EU programmes which have been contributing in FP7 to the smart specialisation drive, the one with the most significant impacts in terms of cluster development, is the Regions of Knowledge (RoK) Clusters Programme (2007-13), a 126 Million euro initiative which supports regional economic development through consortia of Regional research driven clusters (RRDCs) or a single research-driven cluster having multinational partnership' (including universities, research centres, enterprises and regional authorities). Aimed at enabling regions to strengthen their capacity for investing in economic development and conducting research and technological development activities tailored to contribute to regional economic development, this programme supports the design of research agendas for RRDCs, mentoring and integration activities. In recent years, efforts have been underway to promote a more direct orientation of the RoK in support of smart specialisation.

In this annex, the relevance of the EU FP7 Regions of Knowledge Clusters Programme for the design and implementation of S3 strategies is examined, by comparing the objectives and rationales of the two initiatives and studying how these have been translated into practice in the case of the RoK Clusters Programme. The analysis focuses on two levels:

- determining the extent to which successful RoK cluster projects can serve as building blocks for Smart Specialisation Strategies; and;
- identifying key lessons learnt from the RoK Clusters experiences to date and the extent to which they are transferable and can be used in the smart specialisation drive currently underway in a number of member states and regions that are beneficiaries of Structural Funds.

Smart Specialisation Strategies and the RoK Clusters Programme share a number of related objectives and rationales, as well as targeted outputs and impacts. In general, this highlights the possibility and opportunity to incorporate the RoK Clusters approach in the smart specialisation drive, albeit in different ways and to different extents. Nuances which distinguish the emphasis and direction of the two initiatives, however, need to be given particular attention in seeking to exploit the complementarities.

### **Converging objectives and rationales**

Whilst Smart Specialisation Strategies have a wider and more strategic remit, they include a number of objectives which are closely linked to the Regions of Knowledge Cluster Programme (Table A1). Both initiatives are aimed at driving the European 2020 agenda of more jobs and growth, leveraging more funding for R&I and ensuring synergies between different EU funding sources. Where certain differences begin to emerge is in terms of the thematic focus, with the Regions of Knowledge Clusters Programme focusing primarily on research-driven clusters and selecting the thematic areas to be addressed in each call. In contrast, the Smart Specialisation Strategies, while focusing on regional scientific excellence, are also designed to "support practice-based ('non-technological') innovation and include the adoption and diffusion of knowledge and innovation". The thematic or niche areas are to be selected through a process of entrepreneurial discovery involving all the stakeholders. The RoK Expert Advisory Group (2012-3) noted in its report that the RoK topics in 2007 and 2008 were too horizontal and concurred with the Commission's opinion that other restrictive aspects of the scheme in particular eligibility rules, would need to be made more flexible in order to nurture Smart Specialisation Strategies.

**Table A1. Converging Rationales and Objectives between S3 and RoK**

	<b>Regions of Knowledge Cluster Programme</b>	<b>Smart Specialisation Strategies</b>
<b>O B J E C T I V E S</b>	Foster regional growth and competitiveness	Enhance Europe's capacity to deliver smart, sustainable and inclusive growth and jobs
	Enhance regional investments in research and innovation and the ability to mobilize all types of funding therefore, including potential synergies with Structural Funds, CIP and any other source of funding	Strengthen research, technological development and innovation (R&I target); Deliver a more targeted Structural Fund support and a strategic and integrated approach to harness the potential for smart growth and the knowledge economy in all regions; Ensure synergies between Horizon 2020 and the Structural Funds in the interest of capacity building and providing a stairway to excellence.
	Facilitate transnational cooperation of clusters and emergence of European networks on the global stage	Point regions towards more strategic cross-border and trans-regional cooperation to achieve more critical potential and related variety
	Reach inclusion of more regions into ERA	Innovation a priority for all regions; S3 supports the creation of knowledge-based jobs and growth not only in leading research and innovation (R&I) hubs but also in less developed and rural regions
<b>R A T I O N A L E S</b>	<p>RoK clusters focus on analysis, development and implementation of research agendas for regional or cross-border clusters;</p> <p>Identify thematic issues or priorities, based on the analysis of the existing regional plans of RTD and on the development policies of economic sectors; SWOT of the regions in terms of their capacity to produce, transfer and use knowledge; economic development needs; existing RTD policy and activities, their evolution and impact</p> <p>Develop methodologies, tools and activities for bridging research and innovation</p>	<p>To avoid overlaps in development strategies</p> <p>To develop and implement strategies for economic transformation</p> <p>To improve the innovation process - S3 requires smart, strategic choices and evidence-based policy making. Priorities are set on the basis of strategic intelligence about a region's assets (including clusters), its challenges, competitive advantages and potential for excellence</p>
	RoK has a strong transnational element including analysis of European and international context.	To make regions more visible to international investors; To improve a region's internal (e.g. clusters) and external connections (to position themselves in European and global value chains, improve cooperation with other regions, clusters).
	Enhancing R&D capabilities within existing research-driven clusters through intensified	To promote critical mass of resources

<p>collaboration with other clusters at EU level, sharing of research infrastructures,..</p> <p>Strengthening the contribution of existing research-driven clusters to innovation through specific awareness-raising actions and research-industry collaboration at regional or cross-regional levels.</p>	<p>To promote knowledge spillover and technological diversification– through higher value added activities based on specialised technological diversification in emerging economic activities, e.g. cross-clustering.</p>
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In terms of the rationales, the two initiatives address similar policy and market failures and seek to invest in similar types of governance processes, bringing key regional entrepreneurial players together, focusing their efforts on analysing existing economic development plans and designing effective strategies based on strategic intelligence on regional strengths and opportunities. The smart specialisation drive highlights the process of entrepreneurial discovery and the need to abandon sectoral boundaries in identifying new higher value added niches.

### **Insights from the RoK Clusters Programme Assessment**

The 2011 EU-commissioned evaluation of the 'Regions of Knowledge' programme identified a number of results, outcomes and impacts, which the Report qualified as a "non-negligible role" in the smart specialisation of regions (Bruno et al. 2011). The Report noted that the projects have focused on areas of strategic importance, investing either in the restructuring of an area of traditional strength or an area of future emerging importance for regional economic development, e.g. AGFORISE, a cluster focused on agrifood, a key area of future regional economic development in the Turkish Mersin region, while BIOCLUS (sustainable development) and CERADA (globalisation of the automotive industry) address restructuring of traditional areas of strength. Project work undertaken in developing the state-of-the-art analysis, strategic agendas and joint action plans has contributed to the development of sectoral regional innovation strategies, thus moving the region a step further in terms of smart specialisation. It also supports the assessment of the match between the supply (R&D capacities) and the demand (business and innovation) and improved articulation of supply and demand. At this stage the extent of the impacts has still to be determined, however, the projects are reported to have made significant contributions in terms of mutual learning, transnational and cross-border collaborative links between RRDCs, knowledge transfer and skills and capacities development for cluster management and strategy design and implementation.

The Report's main findings highlight the extent to which the RoK programme achieved its set objectives and what resulted in practice, which are relevant for smart specialisation, including:

- The Programme has contributed to increasing awareness of the need for regional investments in research and innovation and has enhanced capacities for securing European funding. The projects have with few exceptions been less effective in accessing Structural Funds and other national or regional funding. This raises concerns over sustainability, although this depends on the effectiveness of the cluster development process;
- The Programme has achieved its goal of transnational cooperation and emergence of clusters on the global stage – it has strengthened links between the triple helix regional actors and at inter-regional level. There is evidence of upscaling over time contributing to critical mass and international competitiveness;
- The Programme has been steered over time to focus on excellence and existing clusters rather than integration of more regions into the ERA. This has led to a reduced participation of less research-intensive regions, with a bias towards experienced coordinators and partners based predominantly in large EU member states, notably Germany, France, Spain and Italy. However the mentoring part of the programme and the inclusion of regions which are laggard in terms of their R&D spend, had positive integration effects;
- The shift in 2009 to themes focused on lead markets creates an emphasis on favourable framework conditions for innovation, a key concern of Smart Specialisation Strategies.

**Table A2. Regions of Knowledge Clusters: Relevant Inputs for Smart Specialisation Strategies**

<b>Phases</b>	<b>Results/Outputs</b>	<b>Outcomes</b>	<b>Impacts</b>
<b>State of the art analyses</b>	<p>Strategic intelligence :</p> <ul style="list-style-type: none"> <li>-Business needs</li> <li>-R&amp;D capacities</li> <li>-Demand for innovation</li> </ul> <p>Basis for Mutual learning and Transfer of knowledge</p>	<p>Enhancement of expertise and competence in regional authorities,</p> <p>Strengthening of collaboration within and between the RRDCs, etc.</p> <p>Knowledge and network enhancement</p>	<p>Focus on fields of strategic importance for regional economic development</p> <p>Contributing to the development of sectoral regional innovation strategies</p>
<b>Strategic research agendas</b>	Increased awareness of need for regional investments in research and innovation	<p>Improved intra-regional communication and strategic focus leading to improved articulation in clusters initiatives, of R&amp;D capabilities in the region and industry needs and regional innovation strategies</p>	Development of a strategy, a long-term vision and relationships (that could help to strengthen the cluster) and to gain more knowledge-transfer and know-how.
<b>Joint Action Plans (JAP)</b>		<p>Improvement of clusters' strategic management</p> <p>Improved internationalisation of the cluster</p>	<p>Improved innovation prospects</p> <p>Basis for the enhancement of regional economic competitiveness through research and technological development activities.</p>

The Report recommends strengthening the effectiveness of the programme by:

- Ensuring the early engagement of major representatives of different multi-governance levels in order to secure the commitment of all regional stakeholders;
- Improving the design and implementation of the project by defining clearly the objectives and related actions, setting targets on completion of the state-of-the-art analysis, identifying bottlenecks, and defining a monitoring and evaluation framework.

In addition, it was noted that certain projects reported difficulties in securing the strong involvement of key players in particular private sector companies and in developing trust among the partners. This highlights the importance of these initiatives being industry-driven from the start. The report identifies a number of critical success factors including careful selection of partners, realistic design tailored to different regional context(s), commitment of policy makers, active involvement of regional and/or national authorities, intense dialogue and learning and well-designed budget.

### **THE CHALLENGE OF TRANSFERABILITY**

The experiences drawn from the RoK Clusters Programme to date indicate the level of complexity involved in designing and implementing successful cluster policies and integrating such policies effectively within the policy mix to drive smart specialisation. In seeking to provide guidance to member states and regions embarking on their Smart Specialisation Strategies, a note of caution needs to be sounded at this point regarding policy transfer and the appropriate approach for introducing what has worked well in other contexts into a different local context. There may be unstated assumptions which underpin the RoK approach and may not hold for an S3 analysis. It is important to note at the outset that there are both positive and potentially negative factors which could affect the relevance and effective transferability of RoK Clusters approaches for smart specialisation strategies.

Issues which need to be resolved include:

- The particular country or regional context. This determines the extent to which the transferability of the RoK Clusters approach would prove appropriate and/or effective in itself, and/or as part of the smart specialisation drive. Depending on the size and dynamics of the research and innovation system and the resources available, there would need to be a dedicated assessment of whether and which type of cluster approaches is appropriate and if they should be prioritised at the start. This would depend on whether cluster policies and programmes exist and the extent to which they have proven effective? It would also depend on whether cluster organisations or cluster-type structures exist in the country/region, their level of maturity and the extent to which they already form an integral part of economic development and have the support of relevant stakeholders.
- Existing functional local clusters for smart specialisation. Should existing functional local clusters be used as the starting point/building block for the smart specialisation strategy? But how to resolve the criterion of entrepreneurial discovery? Should existing clusters be integrated into the smart specialisation strategy only if they fit the priorities identified through consultations with the entrepreneurial players? How can one capitalise on existing clusters without appearing top-down? With well-established clusters, the question is how critical they are for the smart specialisation drive and if they should be prioritised? Alternatively they may need to be re-configured? How?
- Managing tensions between research-driven and service innovation clusters. The RoK Clusters Programme includes certain criteria relating to excellence and research-driven clusters based on an international consortium of existing clusters from different regions and countries. In transition countries and regions, the forms of clusters which could prove more effective for smart specialisation, may require a stronger emphasis on innovation and local needs.



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### The role of clusters in smart specialisation strategies

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This report investigates the potential contribution of clusters and cluster policies in the design and implementation of Smart Specialisation Strategies. Both cluster policies and Smart Specialisation Strategies are policy approaches with a place-based dimension, aiming at exploiting advantages of proximity to promote economic growth and competitiveness.

With regions across Europe currently working on their Smart Specialisation Strategies, the question whether and how clusters and cluster policies can be used in this endeavour is highly relevant. Smart Specialisation Strategies are difficult to design and implement because they are based on a new and complex academic framework that now has to be translated into policy practice.

The contention of this report is that lessons learnt from the rich history of cluster policies can provide concrete inputs into the development of Smart Specialisation Strategies (S3).

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