

Smart Specialisation: a promising policy perspective for the Ruhr area?

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Summary: is smart specialisation a promising policy perspective for the Ruhr area?

A Smart Specialisation Strategy (abbreviated as S3) means that a region's economic and innovation policy focuses on a limited number of promising priorities that fit with the region's economic potential. These priorities need not only be high-tech industries or clusters, but may also include non-technological types of innovation. In the S3 concept, the selection of the priorities must be done in a bottom-up and inclusive fashion, including many relevant players, and should not be based solely on the preferences of the policymakers or a handful of powerful players. Smart specialisation is becoming more important for innovation funding: European regions that want to access ERDF funds must have a validated smart specialisation strategy. Moreover, focusing on a limited number of priorities facilitates access to other European research and innovation funds.

For the Ruhr area, developing an S3 strategy could have at least four benefits. First, it could lead to more specialised, sophisticated and specialised business locations, where knowledge, education and business can co-locate and fertilize each other. The Ruhr Area has a large variety of campuses and science/technology parks, some specialised but many rather generic. An S3 strategy could be a catalyst to develop these "pearls in the crown" of the regional knowledge economy into more recognizable and perhaps specialised areas. Second, an S3 strategy could help to channel (public) investments towards a limited number of promising directions. This avoids a dilution of resources, creates more focus and critical mass in certain fields. Third, an S3 strategy could help to identify new common challenges, reduce pointless duplications and rivalry between cities, and could help to redesign the regional innovation support system in the light of a few priorities that are really considered important. Fourth, it could help to channel more European funding into the region. ERDF funding is already conditional on having an S3 strategy, and this will remain the case in the new European programming period.

To design a smart specialization strategy, it is necessary to engage with entrepreneurs and other actors to find agreement on the priorities for regional development and innovation. In this process it is crucial to pick the right mix of actors (from a very large pool that is available in the Ruhr Area), avoiding to end up with the usual suspects, the powerful players, or (on the opposite) marginal ones or people without strong mandate in their organisation. A compelling vision is key. The leaders of the strategy-building adventure must invite stakeholders into a new vision for future change. Such a vision cannot be a hollow communication of a faraway idealistic future. It must be something to relate to, to fight and argue about, to support or attack. This requires strong and imaginative regional leadership.

Several European industrial regions have adopted a genuine smart specialisation approach, and experienced a number of benefits. In Västra Götaland (the region around Gothenburg, Sweden) it resulted in a stronger specialisation of science parks, and a more efficient innovation ecosystem. In the Basque Country, a smart specialisation approach helped to focus on a few priorities (mainly advanced manufacturing), and also worked as a lever to reorganise the innovation support system that had become too complex and overlapping over the years.

1. Introduction

Smart specialisation has been the dominant concept underpinning the EU's regional innovation policy in recent years. In the last programming period of European structural funding, having a smart specialisation strategy was an ex-ante condition for ERDF funding. In the next EU programming period, wealthier regions in the EU must reckon with a significant reduction of ERDF funding for their economic development strategies. Regrettably as it may seem, this also opens a window to reconsider their strategic orientation and priorities, and explore new avenues.

In this report, we analyse what this “next stage of smart specialisation” could mean for the Ruhr area. The study is an input for a conference in the Ruhr area about the topic of smart specialisation. We will address the following research questions:

- What is the essence and rationale of the smart specialisation concept in the European Union, and how it does compare to other regional innovation policies?
- How is the smart specialisation concept perceived and received in academic and professional communities throughout Europe? What are the shortcomings, questions and challenges?
- How could some form of smart specialisation approach be meaningfully and practically applied in the Ruhr area in the near future?

The report is based on a literature study, complemented by an analysis of key economy policy documents about the Ruhr area, and a validating interview with an expert in the Ruhr area. The report is organised as follows. Section 2 intends to answer the first research question, by providing a brief overview of the smart specialisation concept, its theoretical underpinnings, and how it compares to other regional innovation approaches such as cluster policy or mission-oriented innovation policy. Section 3 contains a critical evaluation of the concept from academic and practitioner's perspectives. Based on this, section 4 derives four critical conditions that are required for an effective smart specialisation process. Section 5 presents some examples from other industrialised European regions: The Basque Country (Spain), Norte (Around Porto, Portugal) and Västra Götaland (around Gothenburg, Sweden). Section 6 focuses on the State of North Rhine Westphalia and the Ruhr region. It summarizes the various regional innovation strategies of the last decades, and discusses the current formal smart specialisation strategy of the State, but also other types of innovation policies that contain elements of smart specialisation. Section 7 is titled “from dumb fragmentation to smart specialisation in the Ruhr Area: why and how”, and discusses why a smart specialisation approach could make sense for the Ruhr area, and assesses the region regarding the four key conditions for smart specialisation strategies that were identified in section 4.

2. Smart Specialisation explained

This section offers a brief overview of the smart specialisation concept, its theoretical underpinnings, and how it compares to other regional innovation approaches such as cluster policy or mission-oriented innovation policy.

What is smart specialisation

In 2014, the Research and Innovation Strategies for Smart Specialisation (abbreviated as RIS3) programme was launched, as a renewed and highly ambitious regional innovation programme of the European Union. RIS3 is an integrated, place-based economic transformation agenda that seeks to do five important things (Morgan, 2017): (i) focus policy support and investments on key national/regional priorities (ii) build on the strengths of each country/region (iii) support technological as well as practice-based innovation (iv) involve stakeholders and encourage innovation and experimentation and (v) provide an evidence base by having a sound monitoring and evaluation system (European Commission, 2012: 8).

The basic argument of the smart specialisation approach is that policy efforts should focus on those activities where a region has the most realistic chances to develop large-scale impact (McCann and Ortega-Argiles, 2016), and where it can build on existing and new local and interregional linkages and connections (Foray et al. 2012). Thus, the selected activities and technologies should already be embedded in the region's current economic fabric. In essence, smart specialisation is about identifying "the unique characteristics and assets of each region" (Heimeriks & Balland, 2016, p. 562) that underline competitive advantages, and "mobilizing regional stakeholders and resources around an excellence-driven vision of their future" (Heimeriks & Balland, 2016, p. 562; see also McCann & Ortega-Argilés, 2013).

How should priorities be defined in RIS3?

"Priorities could be framed in terms of knowledge fields or activities (not only science-based, but also social, cultural and creative ones), sub-systems within a sector or cutting across sectors and corresponding to specific market niches, clusters, technologies, or ranges of application of technologies to specific societal and environmental challenges or health and security of citizens (e.g. ICT for active ageing, mobility solutions to reduce traffic congestion, innovative material solutions for eco-construction, etc.). While some regions or countries may prioritize one or more Key Enabling Technologies (KETs), others will focus on applications of such technologies to specific purposes or defined fields." From: <https://s3platform.jrc.ec.europa.eu/faqs-on-ris3>

The term "smart specialisation" was introduced in the context of a broader reform of the EU cohesion policy, aiming to strengthen the place-based nature of the policy, and to support decision-making with a focus on stakeholder involvement, experimentalism and results (Barca, 2009). For the period of 2014-2020, the EU agreed that each member state and region should have a smart specialisation strategy as a precondition to access the ERDF, the main source of funding of the European Cohesion Policy (European Union, 2013).

RIS3 is different from traditional regional innovation policies in several key respects (Foray, 2015; Radosevic, 2017):

- Intervention must be selective, that is, focused on a limited number of well-defined priorities. Priorities could be framed in terms of knowledge fields or activities, sub-systems

within a sector or cutting across sectors and corresponding to specific market niches, clusters, technologies, or ranges of application of technologies to specific societal and environmental challenges or health and security of citizens (e.g. information and communication technology for active ageing, mobility solutions to reduce traffic congestion, innovative material solutions for eco-construction, etc.). (European Commission, 2012a).

- The focus is on the process of discovering new directions and priorities (the entrepreneurial discovery process), rather than policy outcomes, which are considered unknowable ex-ante (Radosevic, 2017).
- Smart Specialisation does not only address R&D and high tech industries, but may also include social, cultural and creative activities, or non-technological types of innovation such as organisational, social, or business model innovation. Thus, innovation is not synonymous with research and development, R&D expenditures and high tech employment, but the very nature of innovation has broadened.
- Smart specialisation is not about picking winners. The priority selection process must be bottom-up and inclusive. The selection of the intervention areas should not be based solely on the preferences of the policy-maker or expert analysis, but derive from an interactive process between policy-makers and the private sector. This is a reaction against the tendency of policymakers everywhere to promote the same fashionable sectors or clusters; also, it goes against the tendency to reinforce existing regional strengths rather than to broaden the range of innovation opportunities (Frenken, 2017).

The entrepreneurial discovery process (EDP)

The entrepreneurial discovery process (EDP) is a central aspect of smart specialisation. It is defined as “a process of discovery and learning on the part of entrepreneurs, who are the best positioned agents to search for the right types of knowledge” (Estensoro & Larrea, 2016, p. 1321). The European Commission developed guidelines on smart specialization in which it put the entrepreneurial discovery process (EDP) in the core (Rissola, Kune, & Martinez, 2017).

These guidelines describe the EDP as an inclusive and interactive bottom-up process in which actors from policy, business, academia, etc. are discovering potential new activities, identifying potential opportunities that emerge through this interaction. Policymakers are to assess the outcomes, and find ways to facilitate the realisation of this potential. The EDP should lead to an integration of the relevant entrepreneurial knowledge that is fragmented over many companies, universities, clients and users (some of them located outside of the region), by building on connections and partnerships (Rissola et al., 2017, p. 24).

Setting up an EDP is far from straightforward. The question arises which agents are to be included, and how to avoid the dominance of powerful incumbent players. According to the EC, a truly inclusive smart specialisation governance structure “should be able to prevent capture by specific interest groups, powerful lobbies, or major regional stakeholders” (EC, 2012: 21). More broadly, smart specialization is expected to answer the 1 million dollar question of policy-making: how to involve a wide spectrum of agents in policy design and implementation, and how to choose priorities while overcoming the dominance of particular interests or the public sector (Morgan, 2017).

Theoretical underpinnings

Smart specialisation has theoretical underpinnings in three streams of literature: institutional economics, neoclassical economics, and entrepreneurial ecosystems.

From an institutional economics perspective, smart specialisation recognizes innovation as a collective social endeavour, where new development paths are disclosed by the mobilization of localized, often tacit knowledge and iterative learning across a network of public and private actors. It assumes that economic decisions by entrepreneurs are based not only on general information conveyed by the price system but also on knowledge that is local, that is, it is possessed by individual actors and is not freely available, and often tacit, that is, it is not articulated or codified, and thus cannot be immediately accessed by others (Hayek, 1945). Smart specialisation rests on a notion of collective action, and recognizes that the quality of governance and public service provision matters more for regional economic performance than it was once thought (Charron et al., 2012; Rodriguez-Pose and Di Cataldo, 2015). In capitalist economies, highly specialised individuals and teams know a great deal about very little. The productive strength of the system as a whole, its collective knowing, depends on how these pools of specialised knowledge and capabilities are connected. Connectivity requires organisation and co-ordination; it also depends on playing by the rules of the game, and on belief and trust so that actors can rely upon the testimony and actions of others. A lack of trust leads to low levels of connectivity and a loss of system coherence. (Metcalfe, 2014: 11).

Neo-classical economics. From this point of view, the question is asked why and when governments should intervene in markets. In the case of smart specialisation, what could be a justification for interventions that are specific, aimed at certain targeted activities, rather than more generic and horizontal? The argument is that two relevant market failures are at work that hinder regional innovation: information externalities and co-ordination externalities. Information externalities arise because for individual companies, it is costly and risky to invest in experimentation and R&D for new products or services (Hausmann & Rodrik, 2003); they carry the costs, but do not capture all the benefits because their discovery may be copied by others and generate wider social gains. This leads to an under-investment in such discovery activity. *Coordination externalities* arise because establishing new activities often requires simultaneous up- and downstream investments, with uncertain returns and perhaps high fixed costs which discourage private investment. The role of industrial policy is therefore to elicit information from entrepreneurs on these externalities and devise possible ways of correcting them according to a highly targeted and selective intervention logic. The policy measures should be selective and specific, because a particular economic activity requires specific inputs (Hausmann & Rodrik, 2006). Thus, policy measures should be designed with the specific characteristics and needs of individual priorities as the starting point (Mieszkowski, Gómez Prieto, & Nauwelaers, 2016).

Entrepreneurial ecosystems. From an entrepreneurial ecosystem perspective, it can be argued that networking in the region helps to build economies of scale that are needed for local entrepreneurial initiatives (McCann & Ortega-Argiles, 2016). Well-connected entrepreneurial ecosystems drive local innovation and are critical for enhancing regional competitiveness. This systems type of thinking implies that policies may be targeted on any of the technological, financial, institutional, or skill-related elements within the ecosystem, either to enhance certain features of the local entrepreneurial system, to overcome key constraints and bottlenecks, or to bridge any perceived missing links. There are various well-known market failure arguments for entrepreneurship policy (Storey 2008) relating to private versus social benefits, asymmetric and imperfect information, knowledge externalities, and barriers to entry (Stevenson and Lundstrom 2007).

How Smart Specialisation is embedded in existing regional innovation policy traditions

Smart specialisation is not a new blue-sky concept, but it mingles with existing portfolio's and traditions of regional innovation policy. Before RIS3 emerged, most European regions already had an arsenal of innovation policies, including cluster policies, science parks, technopoles, innovation

funding schemes, incubators, innovation support agencies, etc. (McCann & Ortega-Argilés, 2013). In many cases, in practice, smart specialization policies are a repackaged amalgamation of these initiatives.

In the course of the last decades, innovation policy in Europe has gone through different stages (Hassink and Gong, 2019). Innovation policy 1.0 dates from the post war period, when innovation policy was mainly national, and focused on the promotion of science and R&D. It was based on the idea that government should stimulate science and R&D to correct market failures. The classical argument being that the benefits of science and R&D are high for society as a whole, but cannot be appropriated by the organisation that does the investment. Thus, if the government would not intervene, there would be an underinvestment. Since the 1980s, innovation policy 2.0 emerged. It was increasingly recognized that not only market failures but also systemic failures were holding back innovation, such as the lack of collaboration and coordination between science and industry. New policies were developed to improve the innovation system, i.e. not only the science and technology actors but also their interaction. Cluster policies can be seen as part of this movement. In the recent decade, innovation policy 3.0 emerged: a more mission-oriented innovation policy, with the aim to solve grand challenges and generate sustainable transformation. The idea behind that is that innovation “does not only have a rate, but also a direction” (Mazzucato, 2018): it matters not only how much we innovate, but also with what purpose, or for what societal goal. Innovation policy 3.0 addresses challenges such as climate change, ageing societies, the refugee crisis, food and energy security, etc. (Coenen, Hansen, & Rekers, 2015; Schot & Steinmueller, 2018).

3. Critical evaluation of Smart Specialisation

This section contains a critical evaluation of the smart specialisation concept from academic and practitioner's perspectives. We present 7 points of criticism, and identify a number of risks and pitfalls associated with the entrepreneurial discovery process.

Seven points of criticism

The smart specialisation concept has been criticized on various grounds, some theoretical and others more related to the practical implementation in regions. Here are the main points:

First, the concept as such is criticised. Hassink and Gong (2019) argue that smart specialisation is more about diversification than specialisation. Regions are expected to identify areas or domains of existing or potential competitive advantage, and differentiate themselves from others. Thus, it is mainly about 'diversified' specialization (Asheim, Grillitsch, & Trippl, 2017), or smart diversification (Balland, Boschma, Crespo, & Rigby, 2018; Boschma & Gianelle, 2013; Piirainen, Tanner, & Alkærsg, 2017). Moreover, the difference with cluster policy is not very clear; there are many similarities. Smart specialization is about selecting promising activities in a non-neutral manner. However, as Hassink and Gong (2019) argue, cluster policies have been doing just that. Other similarities with cluster policies include the level of granularity, which is neither the sectoral nor the individual level ('mid-grained level of aggregation'), as well as its inclusive nature: each sector and each territory has a chance to be included. The entrepreneurial discovery process, in particular, started by entrepreneurs and researchers is seen as the main source of information, not administrators, politicians and policy-makers (Foray, 2015, p. 3). However, in principle, this could also be the procedure of bottom-up cluster policy initiatives (Fromhold-Eisebith & Eisebith, 2005).

Second, the implementation of smart specialisation is very difficult in poor regions that most need it. Many authors noted that a successful adoption of RIS3, especially the EDP, is most likely in regions that already have strong institutions, high levels of trust, and a diversified economy. Many weak or disadvantaged regions in Europe –to which cohesion policy is mostly directed- are plagued by corruption and capture of special interests, and lack the organisational capacity to deploy a meaningful EDP. But there are problems for strong regions with good institutions as well: as observed by Trippl, Zukauskaitė, and Healy (2019), these regions face difficulties regarding who to include in the EDP, and how to balance the needs and ideas of a large number of capable actors.

Third, a RIS3 strategy is an ex-ante condition for accessing ERDF funding, but what happens in the implementation stage? The European Commission has the intention to follow up on the strategies; a 6% performance reserve is to be allocated after interim evaluation, and thus can be seen as conditional on good RIS3 performance. In practice, Capello and Kroll (2016) fear that RIS3-type exercises will arguably have moved back from a politically imposed and required conditionality to a stronger extent voluntary process that will take place in earnest if, and only if, regional actors agree that it is locally feasible and makes a relevant contribution to their regional economy. Gianelle et al. (2019) also see a gap between strategy and implementation: they find that many regions and countries put much effort into defining quite complex sets of priorities -supposedly based on wide stakeholder involvement in an entrepreneurial discovery process- but much of the information contained in those trees is not used to orient policy implementation.

Fourth, one may question to what extent RIS3 will really change a regional culture of collaboration. Morgan (2017) argues that in every region, RIS3 is embedded in a "repertoire": an assemblage of cognitive processes, policies and practices that is routinely used to frame and foster a particular

model of regional development and it is shaped by an inherited ‘artifactual structure’, which consists of the accumulated beliefs, institutions, instruments and technologies that condition the choices of agents (North, 2005).

Fifth, RIS 3 is a rather vague about the number of priorities to be selected. The European regulations state that the number of priorities should be limited, but give no further indication on how to evaluate their number, which presents the real risk of circumventing the selectivity principle by establishing many narrow priorities that, jointly, cover a wide spectrum of activities. In an overview of priorities selected in Italian and Polish regions, Gianelle et al (2019) find large sets of priorities that, de facto, circumvent the principle of selective intervention, as the strategies ultimately cover most of the broad economic areas. Thus, there is only a partial transition from the ‘old’ undifferentiated industrial policy, typical of European regional policy before 2014, to the highly selective Smart Specialisation approach.

Sixth, administrative regions may not be the right spatial level for to design regional innovation policies (Capello and Kroll, 2016). In most European regions, RIS3 strategies are designed on the level of administrative NUTS2 regions, and hence are not based on the spatial scale of innovation networks.

Seventh, as argued by Mazzucato (2018), smart specialisation does not sit well with more contemporary mission oriented innovation policy. Uyarra et al. (2020) identifies two key characteristics of mission-oriented innovation: 1) more attention for the direction of innovation (i.e. addressing urgent societal challenges) and 2) the idea of missing markets (i.e. there is no market for climate change). Most mission oriented innovation cannot be approached liked technological missions such as Apollo (mission: we put a man on the moon), because in many cases, the problems to be addressed are wicked problems. The nature and urgency of the problem is not straightforward but ambiguous and contested, and there are many possible solution pathways. What is ‘socially desirable’ is subject to interpretation (Fitjar et al., 2019). The question emerges then how smart specialisation can be reconciled with this new type of mission oriented policies. According to Foray (2018), smart specialization policy can fit within the mission-oriented policy type: because it is non-neutral (there is preferential intervention), it can be relevant for new types of missions. Others have more doubts, arguing that smart specialisation is still more about addressing market failures and system failure than achieving particular societal missions.

Risks and pitfalls of EDP

Setting up an entrepreneurial discovery process to select priorities sounds compelling. It would circumvent the capture of special interests, and help find real and indigenous innovative pathways for the regional economy by extracting and combining the insights from many relevant players in the region and beyond. It could facilitate economies of scale when it leads to investments in new pooled knowledge resources for the promising activities. However, the process is fraught with difficulties. As already mentioned, an EDP is problematic in regions with poor preconditions for innovation, and those that lack the capacity for the identification of new related activities. Capello and Kroll (2016) note that there is often a lack of political willingness to engage in a bottom-up, participative processes, and many regions lack the capabilities to engage effectively in a process of regional entrepreneurial discovery.

According to Sotarauta (2018), the entrepreneurial discovery process is not just a technological process to select competitive industries/priorities, but it is a very complicated social and political process, where issues such as power, vested interests of different groups, etc., need to be taken into account (see also Magro & Wilson, 2019). Grillitsch (2016, p. 22) also points at these risks, stating

that ‘picking winners, rent-seeking behaviour, corruption and lock-ins ... are typically associated with place-based policies, such as smart specialisation’. The absence of strong institutions, good governance and political goodwill will jeopardize the good intention of the smart specialization policy (Rodríguez-Pose, 2013). A wrong-headed entrepreneurial discovery process will lead regions not to lock-out from negative path dependence (Martin & Sunley, 2006) but to regional lock-ins; there are plenty of examples of old industrial areas, which have been suffering from all kind of lock-ins hindering transformation, diversification and modernization (Hassink, 2010, 2017).

4. Four critical conditions for RIS3 design and implementation

Based on the literature, the following conditions can be identified that determine the effectiveness of Smart Specialisation and especially the Entrepreneurial Discovery Process (EDP):

Governance conditions: A RIS3 strategy, as a bottom-up and entrepreneur-driven collective venture, is dependent on subnational-level actors' autonomy and power to make choices and decisions for setting collective objectives, finding a shared vision and achieving place-based objectives (Barca, 2009). But in many countries, local/regional autonomy is limited, and resources, capacities and policy tools are distributed across various ministries, regional development agencies and other organizations, which leads to complex public–public coordination side by side with complex public–private interactions (Capello & Kroll, 2016).

Capability conditions. Strong and specific capabilities are needed to design and implement effective smart specialisation policies, and they need to be consciously developed. Many regional development agencies simply do not have enough competent staff to take care of smart specialization tasks adequately, and some regions rely too much on external consultants (Kroll et al., 2014). Regional officers are typically educated in law, public administration or spatial planning, but lack the capabilities to mobilize actors and coordinate complex, continuously evolving processes (Kroll et al., 2014). This explains why many regional development staff had difficulties learning how smart specialization procedures differ from traditional industrial policies (Kroll, 2015).

Effective mobilization of actors: Smart specialization assumes that entrepreneurs have the capacity and willingness to identify new technologies and opportunities as focal points in regional development and innovation. There is plenty of evidence that innovative entrepreneurs are good at opportunity identification (Shane & Venkataraman, 2000), but: are they willing to share their insights, and contribute to collective discovery processes? First, not all entrepreneurs are willing to invest their time and money in such a collective strategy as smart specialization. Second, many of them may not grasp (or respect) the importance or logic of a collective strategy process. Third, it is questionable to what extent mobilized entrepreneurial actors want to share their thinking with potential competitors. Fourth, it is overly idealistic to assume that stakeholders would abandon their own incentives, logics, drivers, ambitions, visions and paymasters and think only of the region's best interests. A biased mobilisation of actors may lead to a misallocating public resources (Camagni, Capello, & Lenzi, 2014; Capello, 2014; Estensoro & Larrea, 2016). As observed by Benneworth et al. (2017), if actors are mobilised in an emergent, informal and flexible way, there is a risk that the “wrong” people are on board, leading to the prioritisation of irrelevant issues or serving only marginal interests. In sum, it is a delicate art to mobilize the right type of assembly. In addition, there is a connection to other traps: the ways actors are mobilized depends on the governance system and capabilities, and institutional conflicts may make mobilization harder than it should be.

Visioning: Visions, brands, images and narratives play important roles in socio-economic and political developments. They act as orientations and interpretation frames for the future-oriented actions of many actors. Pioneering leaders can influence actors' cognitions “by inviting them into a new visionary context for future change” (Hu and Hassink (2017, p. 4). A vision is not only about communicating desired futures but also something to relate to: to fight and argue about, to support or attack. In the hands of skilful place leaders, vision is a powerful tool for exercising interpretive leadership when navigating across the many smart specialization traps and/or working to remove them step by step. The best visions create a tension between the past, present and possible as well as imaginable futures that touch the deepest emotions of the stakeholders. A truly powerful shared

vision thus serves to boost regional innovation. The vision should guide the government to make choices and allocate funds (Foray, 2016, p. 1434). Open policy processes should promote a more inclusive policy-making, but they may hide existing institutionalized power inequalities “under a nicely wrapped strategy package”. The process of vision development is key here, and should focus on specific actions being invented through the inclusive and interactive process (Healey 1997). In this light, smart specialization creates an arena for discussions, battles and quarrels; it is a quest for awareness building, learning a shared language and vocabulary for addressing the main issues, and constructing collective beliefs (Sotarauta, 2016). A genuinely shared vision and collective mutually supporting action may be achieved “if and only if we respect the multitude of visions and values and do not believe in one grand shared vision only”.

5. Examples of Smart Specialisation in industrial regions

In this section, we give a snapshot of Smart Specialisation approaches in other industrial region: The Basque Country (Spain), Norte (Portugal), and Västra Götaland (Sweden).

Basque Country: Using Smart Specialisation to reform the innovation system

With a population of 2.1 million, the Basque Country is an industrial region, widely regarded as an old industrial region that successfully met the challenge of economic renewal in the 1970s and 1980s; It is internationally regarded as a regional transformation success story (OECD, 2011: 42).

The region has a strong cultural identity, and a high degree of fiscal autonomy, with far-reaching competences in research, science and education policy. Over the last decades, it has built up a complex system of innovation, known as the Science, Technology and Innovation network (STI), that comprises a large number of institutions active in basic and applied research, development, technology transfer and innovation. Over the years, and after several reforms, the complexity of the system increased, up to a point where it was no longer clear which institute does what and why; there was competition between centres, and also between departments of the Basque Government as to who is driving the regional innovation strategy; moreover the system had become very costly, and the financial situation of the regional government had deteriorated due to the financial crisis.

Interestingly, the region used the smart specialisation approach to streamline and reform its innovation policy. Through an interactive process, three strategic priorities were chosen: advanced manufacturing, energy and biosciences/health. They combine traditional sectoral strengths (in energy and manufacturing) with new technological ambitions (in bio-science and nano-technology). The existing cluster organisation were involved in the priority selection process.

Perhaps more importantly, the innovation system was reformed. A stronger and clearer leadership role was given to the STI Council, the highest authority regarding innovation policy in the Basque Country. It now includes all government tiers, the three Basque universities, the technology centres and the innovation agencies Innobasque and Ikerbasque; a STI commissioner was appointed who reports directly to the president of the region. The Council has taken bold decisions to streamline the innovation system, to reduce duplication and rivalry (Gobierno Vasco, 2014).

Rooted in a long tradition

In a recent study, Kevin Morgan (2017) argues that new types of regional innovation policy such as smart specialisation are always embedded in long traditions and “repertoires”. The Basque repertoire rests on some deeply rooted, long-standing and widely held ideas about the regional economy: that manufacturing is important, that endogenous capacity is key, and that the region has a key role to play in promoting innovation together with the industry. The Basque smart specialisation strategy is based on this repertoire, but contains some new elements compared to past policies. First, the strategy was designed in an open and iterative way, involving more partners and departments other than the regional Department of Industry that used to be the dominant department in the Basque Government. Second, the smart specialisation exercise was used as a means to reform and simplify the highly complex regional innovation system. And third, the Basque Government is developing ‘entrepreneurial discovery spaces’ where public and private partners can explore potential new projects; these spaces also engage the existing cluster associations that were built up over the past decades. The most recent example of such a space is AS-FABRIK, intended to renew the regional industry sector that is facing the challenge to adopt digital technologies and

create new service-based concepts. This asks for new types of entrepreneurship, and a deeper embeddedness of industry in an innovation ecosystem with providers of relevant services, knowledge, technology and education. Bilbao AS-FABRIK is currently under construction, and should become an innovation, education and entrepreneurship hub for the industry and related advanced services. It will be a place where companies meet each other, where they can explore and develop new partnerships, where new business ideas will be born and nurtured, and where training activities take place, all under one roof. It should become a hotspot for the industry 4.1/KIBS community, not only in Bilbao but the wider region. The centre is being built in the heart of the Zorrotzaurre Pensinsula, a former industrial area (including residential and retail functions) that is being transformed into a mixed innovation quarter in the coming decades.

Despite these successes, the introduction smart specialisation is not without problems. There is substantial resistance to the new, more open approach, especially from ‘incumbent actors and constituencies of these policies with vested interests’ (Landabaso et al., 2014: 403).

Norte, Portugal: following the EC guidelines to select priorities

The Norte region in Portugal is a highly industrialised region with 3.5 million inhabitants. Portugal is not a regionalised country (apart from two autonomous regions: Azores and Madeira). The regional dimension of public administration is mostly relegated to the State’s decentralised administration bodies: Regional Coordination and Development Commissions (CCDRs), regional directorates and groups of municipalities (“inter-municipal communities” that form the NUTS III regions).

In Norte Region, the design of the smart specialisation strategy was a collective construction process that began in June 2012, with a strong involvement of the main regional actors (about 130). The strategy was submitted to public consultation, seeking a broad regional participation in order to enrich and improve the regional strategy of smart specialisation. In the conception of the strategy, the region followed the six-step approach, established in the “Guide to Research and Innovation Strategies for Smart Specialisations”¹ published by the European Commission, that comprised the following activities:

- (i) analysis of the regional context and potential for innovation;
- (ii) set up of a sound and inclusive governance structure;
- (iii) production of a shared vision about the future of the region and strategic objectives;
- (iv) selection of a limited number of priorities for regional development;
- (v) establishment of suitable policy mix;
- (vi) integration of monitoring and evaluation mechanisms.

Priority identification

The region selected 8 priority domains. To select priorities, the region used the conceptual model as depicted in figure 1. A specific domain was considered as a priority if it had critical mass in three aspects.

1. It should be founded on unique regional **resources and assets**, which could be technological (analytical and synthetic knowledge) or non-technological (for example, symbolic capital). Based on an analysis, areas with critical mass were identified, technological and non-technological, that enable knowledge creation and innovation promotion.
2. The second vertex of the model, **innovation**, analysed the regional entrepreneurial basis (dominant and emerging), with the purpose to evaluate how resources and assets are

¹ https://ec.europa.eu/regional_policy/sources/docgener/presenta/smart_specialisation/smart_ris3_2012.pdf

integrated in the regional creation of economic value. This exercise was supported by several studies, in the technical competences and knowledge of CCDR-N and in frequent interaction with the main regional stakeholders.

3. **Advanced users** reflects the (future) demand side for innovative products and services; an analysis was made of market tendencies (international, domestic and regional demand) and the potential of the innovative public procurement.

In the end, based on the above described analytical model, eight priority domains for the RIS3 were identified and categorised as “Core”, “Emerging” and “Wild Card” (Figure 2). “Core domains” are those with a strong business and research/technology presence, as well as advanced users in the region; “Emerging domains” are present but with a smaller critical mass; while “Wild Card” domains are good opportunities in the future with assets identified, but so far with limited activity deployed in the region. After this selection process, the principal regional stakeholders were invited to thematic workshops, one for each priority domain. The workshops had representatives from the quadruple helix: companies (technology producers and advanced users), universities, R&D and interface institutions in the process of collaborative leadership and entrepreneurial discovery.

Figure 1 conceptual model

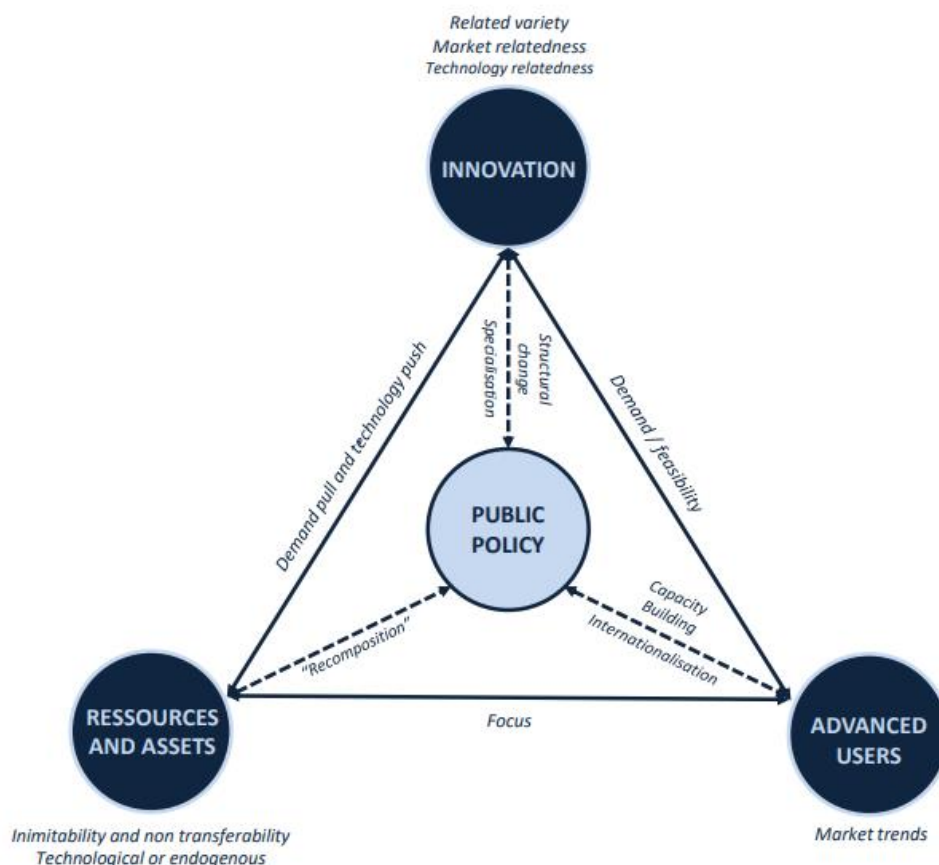


Figure 2 Priorities



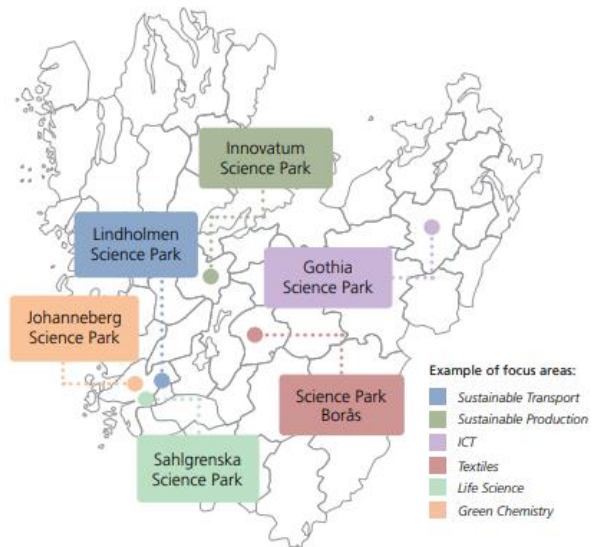
Västra Götaland, Sweden: Aligning smart specialisation with location policy

Västra Götaland (with capital Gothenburg) is the second largest region in Sweden and home to large industries such as Volvo Cars, Volvo Group, SKF and Astra Zeneca. The region is strong in research and innovation with high spending on R&D and five well renowned universities. Industry is at the heart of the regional economy. The region's Smart Specialisation Strategy is integrated in the wider growth and development strategy for the region, Västra Götaland 2020. It prioritises six domains: life science, transport, green chemistry, materials, textiles and the maritime sector.

Interestingly, each area of strength thematically matches with one of the six science parks in Västra Götaland (see figure 3). These science parks enable collaborations between academia, the private sector and the public sector. The introduction of Smart Specialisation in Västra Götaland has brought more clarity of roles, competences and areas of expertise among actors in the region. This has resulted in a stronger collaboration between science parks and incubators, avoiding overlaps of actions and thus enabling a more efficient innovation ecosystem where actors get high quality support when needed.

In one of the priority domains, Textiles, remarkable successes have been achieved thanks to the targeted policy interventions. The textile sector in Borås had lost many jobs during subsequent economic crises, but has renewed itself, moving to innovative products with new materials and smart sensors in fabrics. The Region Västra Götaland supports the textile hub in several ways, for example through the programme for Circular Fashion and Sustainable Interiors (funding was provided to innovation and new business models development). Many textile companies are clustered in the Textile and Fashion Centre where the Swedish School of Textiles and many support functions to the innovation system, such as incubators, are located.

Figure 3 Science parks and specialisations



6. Smart specialisation for the Ruhr area: current approaches

In this section, we explore the current situation regarding smart specialisation in the Ruhr area. We start with a short overview of the regional innovation policy approaches over the last decades, from the Future Initiative in the late 1980, to the cluster policies in the 2000s, to the current “lead markets” approach; also we discuss alternative regional innovation approaches such as the IBA Emscher park (with an innovative governance model), Innovation City Bottrop (mission-oriented and integrated), and Umbau 21 Emscher-Lippe (focused on the broad theme of digitalisation). Also, we describe the current RIS3 strategy of the State of North Rhine-Westphalia (NRW), for the 2014-2020 period, and situate it in the broader context of current cluster and lead market approaches.

Regional economic and innovation governance in NRW

The Ruhr area is part of the region of North Rhine-Westphalia (NRW). Big branches in this region are machine building, chemical industry, steel, metal, car, environmental tech, and energy; about 50% of jobs is directly or indirectly industry related. NRW is home to 19 of the 50 largest German companies, including Thyssenkrupp, Henkel, Bayer, Evonik and Lanxess. In the last years, growth was highest in IT and Health industries.

In NRW, regionalised structural and innovation policy dates back from the late 1980s and early 1990s, when the state government initiated the Future Initiative, aimed to promote economic development in the regions that were hard hit by the closing of the mines. The Ruhr region was one of them. NRW expected regions to draw up regional economic programmes and projects, based on voluntary networked cooperation between actors that should develop a shared vision of the specific regional challenges and needs –almost a smart specialisation exercise. The regional programmes thus created a list of project priorities. But in the end, results were somewhat disappointing. The regional development programmes turned out to be very broad, lacked focus, and all looked similar, addressing traditional fields such as traffic and streets, industrial sites, qualification, technology transfer, or “sexy” new sectors like biotechnology. Moreover, companies had not been involved in regional strategy development (Rehfeld and Terstriep, 2019).

The year 2001 marks the beginning of a new policy approach towards regional innovation, when the NRW government introduced the first type of cluster policy in the Ruhr Area. Twelve “competence fields” were identified, technology-oriented areas, identified by research from consultant Roland Berger (2001). The Ruhr then was a focal region for this policy because resources from the ERDF were restricted to the Ruhr area by that time (Rehfeld and Terstriep, 2019). The programme was managed by the regional development agency, then named Projekt Ruhr GmbH. In 2007, the new NRW government adopted a cluster approach at the state level, and identified 16 strong and promising clusters. Cluster management organisations were set up for each cluster, to manage the programs and resource allocation; the cluster organisations are co-funded by the industry. When the government changed again, the 16 clusters survived and became integrated into the strategic umbrella of a number of “lead markets”. The argument for this shift was to complement the supply-oriented cluster approach with a future-oriented vision on promising new lead markets: specific application areas that would combine inputs from various clusters (see table 1). The programme introduced competitive calls, with project proposals scrutinized by a demanding jury. This led to a higher quality of project proposals, but at the same time entailed fragmentation: it made it difficult to combine bundles of projects in a strategic regional way because each sub-project had to succeed in a different competitive call (Rehfeld and Terstriep, 2019).

The current smart specialisation strategy that NRW wrote for the 2014-2020 period (approved in November 2014) is based on the lead market and cluster approach, but also includes elements of a mission-oriented approach: proposals should address one of the large societal challenges as identified by the EU. Proposals and requests for funding are evaluated by independent juries, according to the following criteria:

- a. what is the contribution to grand societal challenges (energy, climate change, ageing population, etc)
- b. Does NRW have proven capabilities in the area in which support is asked?
- c. Is the activity innovative and sustainable and does it have a high chance to be transformed into products and services?

The terms of reference for the competitive calls typically insist on pre-competitive cooperation and on the involvement of universities or research agencies. The financial resources are provided by the European structural funds and cover approximately €640m between 2014 and 2020.

Table 1 Clusters and lead markets in NRW, 2014-2020

Cluster \ Leitmärkte	Anlagen- und Maschinenbau	Energie- und Umweltwirtschaft	Informations- und Telekommunikationswirtschaft	Life Science	Medien und Kreativwirtschaft	Mobilität und Logistik	Neue Werkstoffe	Gesundheitswirtschaft
Automotive	X	X				X		
Biotechnologie		X		X			X	
Chemie		X					X	
Ernährung				X				
Energieforschung		X						
Energiewirtschaft		X						
Gesundheitswirtschaft								X
IKT			X					
Kultur- und Kreativwirtschaft					X			
Kunststoff	X						X	
Logistik						X		
Maschinenbau/Produktion	X						X	
Medien					X			
Medizintechnik				X				
NanoMikro, WerkstoffePhotonik	X	X	X				X	
Umwelttechnologien		X					X	

Meanwhile, apart from the main stream of cluster policy (later complemented by lead markets), there have been several other regional innovation policies in NRW in the last decades (Rehfeld and Terstriep, 2019).

- IBA Emscher Park: The IBA intended to “to bring innovation a non-innovative context”. The programme generated more than 100 projects, with a total investment of €2.5b (1.5 by government programmes). Projects were set up in the fields of housing, infrastructure, labour market, innovation, energy, environmental protection; the most successful ones were in the fields of architectural, landscape and urban development. The approach of IBA was innovative, and had a strong influence in later programmes in regional structural politics.
- Innovation city Bottrop. In 2010, the “Initiativkreis Ruhr” opened a competition in which it invited all cities in the Ruhr area to propose a pilot concept that would reduce greenhouse emissions by 50% within 10 years in a part of the city. The city of Bottrop was the winner, and developed an integrated project for an area with 70,000 inhabitants, 14,474 buildings and an area of 2463 ha. The project was financed by the State of NRW (€500,000 in the first

phase of the project), the City of Bottrop (€42m). On top of that, co-funding of €450m was obtained from other innovation programmes from different political levels (NRW state government, German Government, EU). By 2018, more than 125 projects had been launched under the umbrella of Innovation City in Bottrop (ICR). Innovation City Bottrop can be seen as mission-oriented type of innovation policy. It does not only address technical issues, but also citizen behaviour, governance innovations etc.

- Umbau 21 Emscher-Lippe – making digitalization work. This programme, launched in 2016 by the State of NRW, intended to address the poor level of digitalisation in the state. Key topics of this digitalization strategy included the strengthening of infrastructure, improvement of digital qualifications of the labour force, the support of small and medium enterprises (SMEs), and new business models. Digitalization is not a regional task in the first line but some of the activities had a clear regional focus. For instance, five regional digital hubs were set up to support SMEs in their digitalisation of their businesses (Rehfeld 2017).

A cautious assessment

As described in the last section, the State of NRW has a certified and formal smart specialisation strategy, accepted by the EU as precondition for accessing ERDF funding. But to what extent do innovative actors in NRW and the Ruhr area work according to the principles and preconditions of the smart specialisation concept as described in section 4?

The RIS strategy was written by several departments of the ministries of innovation and research and of economic affairs, and supported by the cluster managers. Input was gathered from several workshops with participants from business and society, but is questionable to what extent this process can be labelled as a true entrepreneurial discovery process. Moreover, one can argue that the smart *specialisation* approach is not very specialised, as in fact it is aiming at many clusters, combined with 8 lead markets. The competitive calls for projects that emanate from the strategy mainly promote pre-competitive technology-driven innovation, whereas one of the main ideas behind the smart specialisation concept is to broaden the notion of innovation to include also non-technological fields and social innovation. From a theoretical standpoint, one can question the definition of cluster policy on the level of the State of NRW, because clusters boundaries do not coincide with administrative borders between states, but should be defined from a functional perspective (taking networks and value chains into account). Rehfeld and Terstriep (2019) note that paradoxically, regional projects like innovation city Bottrop, IBA or Umbau 21 fit more with the ideas of smart specialisation than the official NRW RIS 3 strategy. They include types of non-technological innovation like social innovation, business model innovation, and behavioural aspects, and also have a clear and justifiable regional or local focus.

7. From “dumb fragmentation” to smart specialisation in the Ruhr Area?

Could some form of smart specialisation approach be meaningfully and practically applied in the Ruhr area in the near future? To address this question, we first explore if a smart specialisation approach could add value for the region. Next, we explore cautiously and tentatively, how the Ruhr Area fits with the four critical conditions for a successful smart specialisation approach, as identified in section 4 of this report: governance conditions, capability conditions, mobilisation, and visioning. Finally, we provide some practical steps to be taken.

Why

Economically speaking, the Ruhr Area can be considered as a coherent region for smart specialisation policy. It has a common cultural and economic identity, shaped by the industrial past; it is physically condensed, highly urbanised, and has largely overlapping urban labour markets. Currently, there is an official smart specialisation strategy for the region of NRW. But this region, although it has strong competences in research, innovation and education, should be considered too large and diverse to be a meaningful territorial unit for a smart specialisation type of innovation policy. It has the size of a medium sized European country, and consists of subregions that are very different from each other, some industrial, others rural or more touristic, others very service oriented etc.

In principle, developing a Smart Specialisation strategy for the Ruhr Area might be helpful to fight the current spatial fragmentation and rivalry, to improve the regions’ innovation profile, to guide future public investments, to streamline the regional innovation system, and to increase European funding. We elaborate these points below.

Spatial fragmentation is a recurring problem in the Ruhr Area; Cities and municipalities in the area compete for business and investors, and there is little co-ordination. But in a highly competitive environment, it makes sense to develop more specialised, sophisticated and specialised business locations, where knowledge, education and business can co-locate and fertilize each other, and that offer a high environmental quality. The example of AS-FABRIK in Bilbao may serve as example. This is especially relevant in a knowledge-based economy where competition for talent is fierce, and talent prefers to work in attractive, dynamic environments rather than monotonous business parks; moreover, with an increasing importance of innovation, the co-location of specialised business, research and education can speed up the innovation process. And finally, specialised co-location offers scope to invest in joint and shared facilities on-site. The Ruhr Area has a large variety of campuses and science/technology parks, some specialised but many rather generic; An S3 strategy could be a catalyst to develop these “pearls in the crown” of the regional knowledge economy into more recognizable and perhaps specialised areas. The example of Västra Götaland in Sweden can serve as inspiration: They developed science parks with strong specialisations in line with the smart specialisation priorities.

A smart specialisation strategy could help to channel (public) investments towards a limited number of promising directions. This avoids a dilution of resources, creates more focus and critical mass in certain fields. The Swedish example of Borås (where much was invested in upgrading the textile sector) is illustrative in this respect. In this way, public policy can help to develop scale economies in promising fields, by co-investing in upstream and downstream facilities and infrastructures.

A smart specialisation strategy can assist in re-organising and streamlining the current fragmented offer of innovation support; The S3 strategy of the Basque country can serve as inspiration here. Over the years, a large number of initiatives, institutions and policies have accumulated: incubators, support policies for digitalisation, subsidies, clusters, etc. A smart specialisation strategy could help to identify pointless duplications and rivalry, gaps, and new opportunities, and could help to redesign the system in the light of a few priorities that are really considered important.

Next, a smart specialisation approach could channel more European funding into the region. ERDF funding is already conditional on having an S3 strategy, and this will remain the case; also, in the new programming period, ERDF funding will be channelled through by managing authorities, which is the State of NRW in this case, so the eventual Ruhr strategy will have to be embedded in a wider state approach. But also access to other European funds for innovation, research and smart cities is more easily obtained when the region selects a few priorities and assembles all relevant actors around it. Increasingly, European funding is conditional on working with triple or quadruple helix networks in the region that seek to tackle a specific challenge or mission together.

How? The critical conditions

There is certainly a strong case for an S3 approach in the Ruhr area. But the “how” question is not straightforward. How does the Ruhr area score on the four critical conditions identified in section 4?

Governance conditions. The governance situation in the Ruhr area is complex and fragmented, which complicates a unified and coherent smart specialisation approach. Innovation policies, actions and related funding originate from the State level and the many individual city administrations in the Ruhr Area; on top of that, there are many innovation programmes and initiatives on the federal level and the EU level. On the level of the Ruhr Area, there is currently no strong agency with a mandate for regional innovation policy. There are innovation policies for specific regions (such as Umbau 2020), but they are mainly funded by high level governments. This complex governance situation make it difficult to conceive of a smart specialisation strategy on the level of the Ruhr Area. The question must be answered who would be in charge to manage the EDP, and with what mandate? Are cities and regional authorities ready and willing to relinquish their autonomy in the realm of innovation policies?

Capability conditions. An EDP requires strong capabilities from the side of the regional agency that takes the lead. The people must be able to mobilise and convene the right actors, to design a good process in order to discover new directions together, to transform these inputs into a coherent and convincing vision and strategy, and then to implement the strategy. But given the large experience in the region with participative projects in the last years, these capabilities must be assumed present in a sufficient degree.

Effective mobilization. Smart specialization assumes that entrepreneurs and other actors join to identify new technologies or wider innovation opportunities as focal points for regional development and innovation. A big question is how to mobilise them to join in the EDP. It is important to avoid the many pitfalls of mobilisation, and pick the right mix of actors (from a very large pool that is available in the Ruhr Area), avoiding to end up with the usual suspects, the powerful players, or (on the opposite) marginal ones or people without strong mandate in their organisation. There are reasons to doubt if this right set of actors can be mobilised unless there is a clear and strong perspective of “what’s in it for them”; there must be strong and compelling narrative that makes them believe that it is worth investing time to develop a smart specialisation strategy for the region together, and to share important strategic information and knowledge with other regional actors, among which perhaps also competitors. Moreover, a broad mobilisation of

actors might make it difficult to make really tough choices, there is a large risk of ending up not with a real smart specialisation but with a weak compromise to which all actors can agree.

Visioning. A crucial part of an effective smart specialisation approach for the Ruhr Region would be to have compelling images and narratives that serve as orientation and interpretation frames for the future-oriented actions of the many actors present in the region. Pioneering leaders must invite stakeholders into a new visionary context for future change. Such a vision cannot be a hollow communication of a faraway fairy tale future: It must be something to relate to, to fight and argue about, to support or attack. This requires strong and imaginative regional leadership. A truly powerful shared vision can serve as first step to boost regional innovation and helps to mobilise actors. The vision should guide the government to make choices and allocate funds (Foray, 2016, p. 1434). Currently, such as vision is absent in the Ruhr area. It should be developed as part of the EDP, and requires to mobilise the actors as described above. Moreover, if the vision is to shape reality, it must be connected to funding and incentives.

Concrete steps

Based on the previous, the following steps could be taken:

- Select a limited number of priorities; do not only focus on sectors or technologies; also include social, cultural and business model innovation
- Develop and formulate a shared and appealing vision
- Build a solid coalition, in which you engage existing organisations (development agencies, cluster organisations, cities) from the start
- Create a good governance structure to secure commitment and capacity to implement the strategy, also in difficult circumstances
- Set up working groups to elaborate the priorities into a meaningful and realistic strategy

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Willem van Winden is a long-term affiliate with Euricur, and professor at the Amsterdam University of Applied Sciences. His research focuses on urban/regional innovation policies and strategies. He was involved in numerous international comparative studies and projects in these fields, including comparative studies on knowledge-based urban development, the future of urban manufacturing, and clusters. He has published seven books and many peer-reviewed scientific articles, serves as reviewer for a range of journals and funding agencies internationally and is currently acting as adviser for several cities, city networks and other organisations, including URBACT (Europe’s largest exchange and learning programme promoting sustainable urban development), Urban Innovative Actions (UIA), and EUniverCities (a network of European cities and universities). He frequently delivers speeches and lectures across Europe, and designs/moderates workshops for inter-city learning. He worked specifically on the S3 topic as expert in the InFocus project, an URBACT project where 10 European cities (Bielsko-Biala, Bilbao, Bordeaux, Bucharest, Frankfurt, Grenoble, Ostrava, Plasencia, Porto, Turin), led by Bilbao, exchanged knowledge about their about smart specialisation strategies.

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