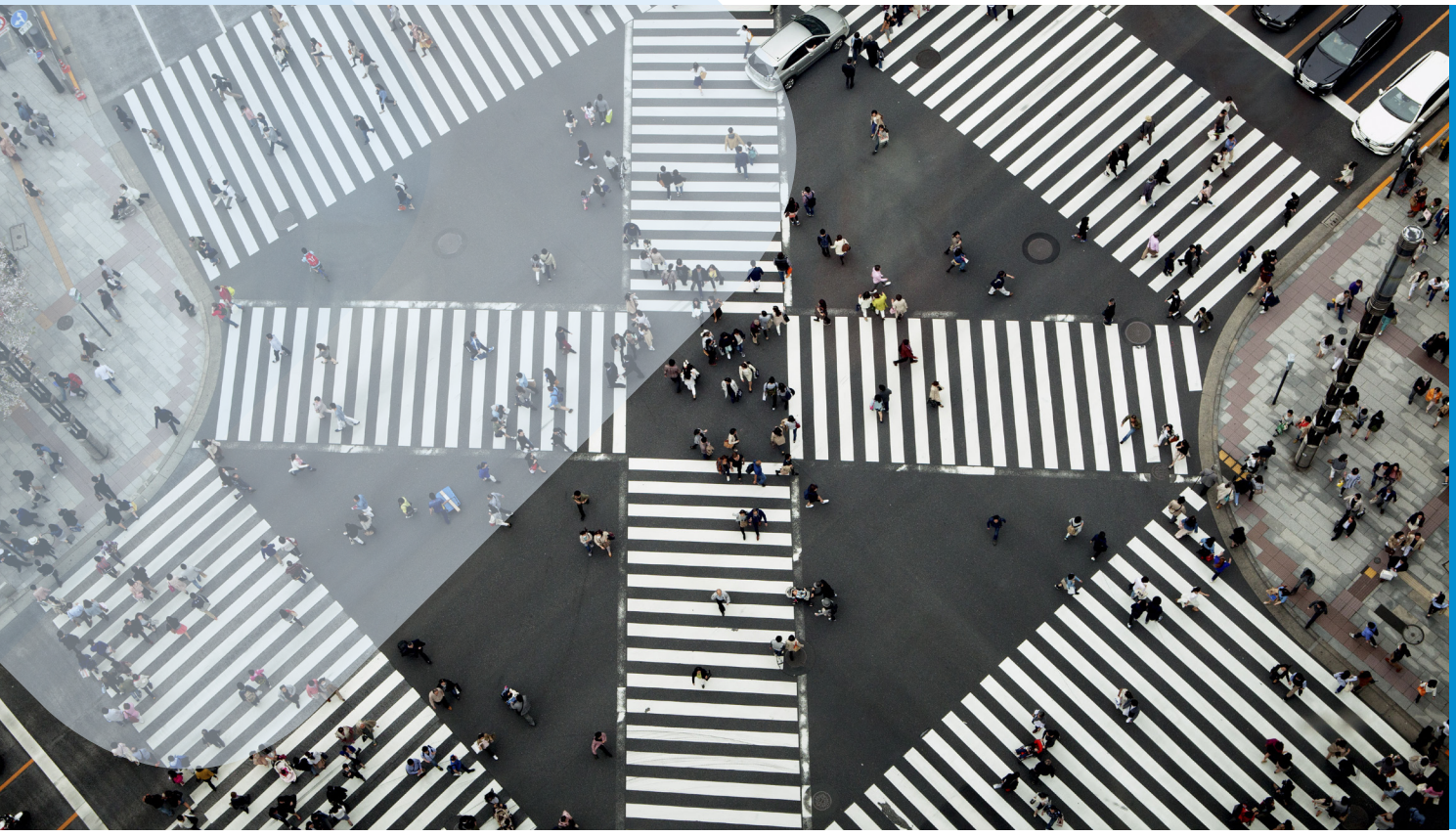
RESEARCH REPORT

Eurofound

Developing regional industrial policy capacity



Future of Manufacturing in Europe

Developing regional industrial policy capacity

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European Foundation for the Improvement of Living and Working Conditions

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Abbreviations used in the report

3D	three-dimensional
EARDF	European Agricultural Rural Development Fund
EDP	entrepreneurial discovery process
ERDF	European Regional Development Fund
ESF	European Social Fund
ESIF	European structural and investment funds
ESM	efficient and sustainable manufacturing
FDI	foreign direct investment
GDP	gross domestic product
GVA	gross value added
HR	human resources
ICT	information and communication technology
IPR	intellectual property rights
KETs	key enabling technologies
NGO	non-governmental organisation
NUTS	Nomenclature of Territorial Units for Statistics
RAA	Regional Administration Authority
R&D	research and development
RDA	Regional Development Agency
R&I	research and innovation
RIM	Regional Innovation Monitor
RIPS	Regional Industrial Policy Seminar
ROP	Regional Operational Plan
RIS3	regional smart specialisation strategy
SME	small and medium-sized enterprise
STI	science, technology and innovation

Glossary

Advanced manufacturing: 'Production activities able to improve production speed, productivity, energy and materials consumption, operating precision, waste, pollution management and enabling resource-efficient and low emission production. The retained definition is not linked to any particular industrial sector' (European Commission, undated a).

Creative industries: 'Industries that use culture as an input and have a cultural dimension, although their outputs are mainly functional. They include architecture and design, which integrate creative elements into wider processes, as well as subsectors such as graphic design, fashion design or advertising' (European Commission, 2010).

Entrepreneurial Discovery Process (EDP): 'The EDP is an inclusive and interactive bottom-up process in which participants from different environments (such as policymaking, business, and academia) are discovering and producing information about potential new activities, identifying possible opportunities that emerge through this interaction, while policymakers assess outcomes and ways to facilitate the realisation of this potential' (European Commission, undated b).

Horizontal industrial policy: A broad term that can include various interventions which target economic restructuring (Di Maio, 2013) aiming at the right regulatory framework and business climate.

Industrial policy: 'The set of strategic measures targeted at improving the competitiveness of the regional economy, taking into consideration the specific characteristics of the region' (Warwick, 2013).

Industry 4.0: An approach towards automation and data exchange in manufacturing technologies.

Policy capacity: 'The capacity of government and other public actors to plan, develop, implement, and evaluate purposeful solutions to collective problems' (Denis and Lehoux, 2014).

Smart specialisation: 'The smart specialisation approach combines industrial, educational and innovation policies to suggest that countries or regions identify and select a limited number of priority areas for knowledge-based investments, focusing on their strengths and comparative advantage' (OECD, undated).

Triple helix partnerships: Partnerships between higher education, industry and government.

Vertical industrial policy: A broad term that can include various interventions which target economic restructuring (Di Maio, 2013) the focus of which is on selecting and supporting specific industrial sectors.

Executive Summary

This overview report synthesises and compares industrial policy capacity within nine European case study regions, which have been analysed as part of the pilot project Future of Manufacturing in Europe. The pilot project was proposed by the European Parliament and delegated to the European Foundation for the Improvement of Living and Working Conditions (Eurofound) by the European Commission (DG Internal Market, Industry, Entrepreneurship and SMEs). The study on Developing regional industrial policy capacity *is one of several studies being conducted as part of this pilot project.*

Manufacturing regions in Europe

The nine case study regions – Baden-Württemberg (Germany), Catalonia (Spain), Lombardy (Italy), North Brabant (the Netherlands), Pays de la Loire (France), Pirkanmaa (Finland), Pomorskie (Poland), Sardinia (Italy) and West Romania – are diverse in terms of their size, geographical location, economic development and innovation performance. They are geographically well spread across the EU and their total population ranges from close to 11 million inhabitants in Baden-Württemberg to just over 0.5 million in Pirkanmaa. The highest regional gross domestic products are in Baden-Württemberg and Lombardy, while that of West Romania is the lowest. Although all of the regions have recorded growth in their overall populations (over the past five years), they have also witnessed shrinking populations of individuals under 30 years of age, in line with general European trends.

The regions analysed are industrial and manufacturing powerhouses of their respective countries (with the exception of Sardinia which is not known as a major manufacturing region). The cases have been selected based on fulfilling a range of good practice criteria (related to good governance, policy design, implementation and monitoring) and a set of balancing criteria (such as geographical location, size and economic structure), with the objective of obtaining a balanced and diverse coverage of European regions. A number of the case study regions have recently witnessed a strong deindustrialisation process, often catalysed by the recent economic and financial crisis. Lombardy, Pays de la Loire and Pirkanmaa are three regions that have witnessed a drop in the share of employment in manufacturing and in their regional gross value added (GVAs) in industry between 2010 and 2015.

Some of the most prominent clusters across the case study regions include machinery, metalworking, biopharmaceuticals, agro-food, electronics and plastics. At the same time, diversified industrial bases tend to be one of the key strengths of the strong manufacturing regions under study. Catalonia, for example, has a relatively diversified industrial base as no single sector amounts to more than 15% of the total industrial turnover, something that has traditionally contributed to the economic resilience of the region. Several emerging industries have also gained importance in the industrial landscapes of the study regions. Creative industries, for example, have also gained importance in Baden-Württemberg, as well as in Pays de la Loire, while mobility technologies appear among key emerging industries in (again) Baden-Württemberg, Catalonia, Lombardy and Pirkanmaa. In Pomorskie and West Romania, however, the importance of emerging industries remains limited.

Understanding and scope of 'regional industrial policy'

The case study findings show that, although the term 'industrial policy' is widely recognised and acknowledged, many regional policy practitioners and stakeholders were unable to define the exact scope in practical terms (for example, in the sense of what policy instruments it covers, or which government/agencies are in charge of delivery). As such, in most of the cases, regional industrial policy is embedded in the broader regional economic development policy framework. Only a limited number of cases (Catalonia and Lombardy) have a set of policy documents that explicitly define industrial policy.

The range of policy areas and policy challenges considered under different regional industrial policy frameworks varies considerably across the case study regions due to the different regional specificities. The most commonly associated policy areas include innovation and research, clusters, small and medium-sized enterprises (SMEs) and entrepreneurship. In a few cases, regional marketing and investment promotion (typically also covering foreign direct investment activities) and spatial development are areas that are considered to be under the industrial policy umbrella. It is worth noting that higher education and vocational training are areas which are, in general, not directly addressed under regional economic development policies, with decisions being taken at other levels or in other government departments; although regional economic development strategies reference their importance.

Based on the case study analysis, however, it is clear that in the majority of the regions, industrial policy is strongly linked to regional innovation policy. This should be considered (to a certain extent) as normal, given that industrial modernisation and advanced manufacturing depend on the innovation capacities of regional companies. In line with this finding is the fact that there is a very strong overlap and complementarity between industrial policy orientations and regional smart specialisation strategies (RIS3s) adopted by regions as a condition for allocating European Regional Development Funds (ERDFs). In many cases, RIS3s have been developed in parallel to the updating or designing of industrial policy-related documents and instruments that have enabled strong levels of complementarity. In spite of this, it is clear that smart specialisation means different things to different regions. While some of the case study regions focused on specialising in specific industries or themes such as advanced manufacturing, mobility or health, other regions

translated this concept more into 'smart diversification'. This is illustrated by the fact that while some regions have used their smart specialisation strategies to support the development of a selected number of incumbent or traditional sectors, other regions have used them to explore new economic activities or technological niches where the region has a unique expertise and which is the source of new growth.

Industrial modernisation is also an explicit and implicit objective of the regional economic development policies of each case study region. A trend that can be observed across all case study regions is that there is a strong alignment between the national and regional policies for supporting Industry 4.0, an approach towards automation, and data exchange in manufacturing technologies. In this context, the level of interest in advanced manufacturing technologies has increased sharply. Support for advanced manufacturing is currently being rolled out at full steam in the majority of case study regions. Advanced manufacturing encompasses the use of science, engineering and information technologies to improve existing materials, products and processes, or to create new ones.

Relevant key enabling technologies (KETs) for advanced manufacturing include:

- information and communication technologies (ICT) such as cloud computing, data innovation and software engineering;
- additive manufacturing;
- advanced materials, such as nanomaterials;
- ecomechatronics;
- advanced sensors;
- the Internet of Things.

The key priority areas for regional policy interventions in support of advanced manufacturing include:

- resource efficiency and sustainability;
- materials for advanced manufacturing processes;
- industrial automation systems, robotics and manufacturing equipment;
- initiatives with a broader focus targeted at upgrading innovation capacity and competitiveness of industry.

Regional industrial policy governance

The case studies revealed that, in the majority of the regions, stakeholders consider their most recent economic and industrial development strategies as having clearly formulated objectives. Policy objectives and priorities are also, for the most part, considered to be well aligned with key regional challenges, and are thus considered to be relevant. High degrees of understanding, relevance and buy-in on behalf of local stakeholders on industrial policy priorities have been facilitated by the adoption of broader and more open consultation processes in the policy design phase, as well as a more intensive use of policy intelligence tools to gather data on existing challenges and bottlenecks. Case study regions have strongly developed such knowledge, observation and benchmarking functions at both local and European level.

The industrial policy governance of regions is generally determined by the national institutional framework and tends to be influenced by national regulations that set the business environment framework and tax regimes. In countries such as Germany, Italy and Spain where regions enjoy a high level of autonomy, the regional level plays a stronger role in industrial development. In other cases such as Finland and Romania, the regional level has limited powers in the sense of a classical industrial policy. In general terms, higher levels of regional autonomy amount to higher discretionary authority (at the regional level) over the design and implementation of industrial policy. However, even in regions that enjoy high levels of autonomy, the national level is involved in regional industrial development to some extent.

Regardless of the importance of the different government tiers in the development of industrial policy, the regions under study have all developed strong coordination mechanisms to align the different sets of priorities, coordinate the interventions of different regional departments and units, and to align their interests with those of different authorities at the national or subregional level. These coordination mechanisms are considered as essential for the success of industrial policy implementation. Coordination between regional and lower levels of government (such as counties and cities) were observed in all the case study regions, mainly by means of working groups (Pomorskie) or regular meetings and commissions (Baden-Württemberg, Lombardy, North Brabant and Pays de la Loire). With regard to national governments, explicit coordination mechanisms have generally been set up. These take the form of a contract (Pays de la Loire and Pomorskie), a joint agreement (Lombardy) or a pact (Pirkanmaa) signed by the involved parties.

The two extremes of industrial policymaking are represented by:

- a very bottom-up and self-regulated approach, characterised by limited government intervention and driven mainly by non-government industrial stakeholders;
- a fairly top-down and centralised approach, driven by government support and regulation.

In regions where traditionally there has been a more top-down approach to industrial policymaking (Catalonia and Lombardy), there appears to be a shift towards the adoption of more bottom-up processes for the design of economic development and industrial policies. This shift stems from a mix of factors such as the approach to the definition of smart specialisation strategies based on the concept of 'entrepreneurial discovery', and recent decentralisation and devolution reforms. These factors illustrate the growing influence of the European Union on regional industrial policy frameworks.

This observed shift in the case study regions has resulted in the general perception of a changing role of regional authorities in the design and implementation process of industrial policy. They are not only perceived as a

programmer or funder, but also as a facilitator and inspirer. In Baden-Württemberg, Lombardy and Pirkanmaa, it was specifically highlighted that the role of the regional level is considered as an important facilitator of institutional cooperation between and across public and private sector organisations. Similarly, in Catalonia, the main role of the regional government is to provide the framework for the creation of companies and business development and innovation. As a result of this, regions are deploying an array of tools aimed at fostering formal and informal dialogue between regional policymakers and the wider industrial policy ecosystem. Examples include: stakeholder workshops; expert groups; consultative commissions and committees; ad hoc conferences; seminars; permanent public–private dialogue; and open consultations.

In line with this development towards the adoption of multistakeholder approaches to policymaking is the fact that the private sector has become increasingly involved in the agenda-setting process of industrial policy. Although, for some of the regions, the involvement of the private sector represents a long-standing tradition (Baden-Württemberg and Lombardy), in other regions this represents a relatively new phenomenon (Pomorskie and West Romania). Based on the case study analysis, private sector interests and voices are expressed in the agenda-setting process through a number of organisations and intermediary structures, the most frequent of which are chambers of commerce and industry, industry associations and cluster organisations. However, the involvement of trade unions in the industrial policy design process appears to be more limited, in general terms. Globally speaking, it is the public sector – particularly regional authorities and administrations – that are at the forefront of efforts to design and implement regional industrial policy.

Regional industrial policy capacity

The institutional capacities of the case study regions in terms of industrial policy are heavily influenced by their institutional structure and level of autonomy. However, additional factors such as human resources, the existence of internal support structures, capacity building activities, interdepartmental organisation, as well as cultural aspects and the existence of regional implementing agencies, may also have an impact on the institutional capacity necessary to successfully design and deliver regional industrial policy.

In terms of recruitment policy, the case studies reveal different patterns. Overall, the regional case studies have shed limited light on the adequacy of available human and financial resources for existing policy needs. They do show, however, that initiatives explicitly meant to enhance institutional capacities for the design and delivery of regional industrial policy are scarce. Most cited examples relate to either actions aimed at increasing the volume of funding going into this specific policy field or initiatives aimed at reorganising institutional set-ups in order to allow for more efficient decision-making, management and communication within and between regional industrial policy stakeholders. Pomorskie and West Romania are among the few examples of regions that have invested in capacity building activities and human skills enhancement to catch up with more advanced regions.

Yet, institutional capacity is not only driven by financial and human resources, it is also underpinned by other elements such as support infrastructure and information technology (IT) monitoring tools, or non-material factors such as the propensity to cooperate. These factors enable transforming tacit and implicit knowledge into explicit knowledge that can be shared across regional governments and industrial policy stakeholders (knowledge management). Here, certain regions have implemented sophisticated IT solutions in support of the industrial policy cycle, such as the QuESTIO (Quality Evaluation in Science and Technology for Innovation Opportunity) and Open Innovation platforms implemented by the publicly-owned Lombardy IT service company, Lombardia Informatica.

As illustrated by the case of Lombardia Informatica, case studies have shown that implementing agencies play a key role in determining the capacity of regions to effectively design and implement industrial policies. These agencies tend to provide good technical expertise, as well as platforms to interact with the private sector. The involvement of these implementing agencies in the policy design process can also be a positive factor, given their first-hand knowledge about what works (or does not work) in a given regional context.

Implementation of regional industrial policy: The policy mix

The implementation of industrial policy is generally conducted by means of industrial policy mixes. This refers to the combination of policy instruments and programmes used by regions to translate strategic objectives into practical activities at the ground level. Among the key differences between the policy mixes of the case study regions is the extent to which they are managed centrally, or distributed across a broad range of implementing agencies and government levels. In some of the case studies, regional industrial policy is implemented through a set of policy instruments that are mostly managed and overseen by a single player, such as the regional administration. While in others, there is a very high number of policy initiatives and actors in charge of their implementation – in such cases, regional policy mixes can be described as being more 'diffused'. Industrial policy mixes tend to be very diverse in the types and number of schemes and programmes they include. However, some of the most frequent cross-cutting elements in case study region policy mixes are business support focused – business competitiveness, entrepreneurship, internationalisation, research and innovation (R&I), technology transfer, industry–science cooperation and access to finance. Yet, while education and training are traditionally seen as some of the key pillars of industry, the inclusion of these policy fields within industrial policy is far from systematic in the case study regions. There does not appear to be any straightforward explanations for the presence (or absence) of education and training in the regional industrial policy mix, other than institutional set-up (the existence, for example, of separate departments within regional authorities dealing with each of the two policy domains) and tradition.

Regional industrial policy mixes tend to include policies and instruments that are either geared to improving

general framework conditions for industrial development, or targeted at directly providing support to industrial ecosystem stakeholders. As for the former, the great majority of regions have dedicated resources and policies to enable collaboration across industrial actors and stakeholders, particularly by means of clusters and other forms of networking. This is, perhaps, the most frequently found element across the regions. An emerging trend in the support of framework conditions appears to be the use of policy instruments aimed at developing other forms of networks and communities in support of industrial development. These forms of collaboration tend to be broader than clusters and are not always anchored to one specific sector or market. Examples of this include the ACCIÓ (Catalan Agency for Business Competitiveness) grants for RIS3 communities, which are part of the RIS3CAT Catalan smart specialisation strategy. RIS3CAT communities have been created as voluntary associations of companies and stakeholders in the Catalan innovation system. As active stakeholders in the Catalan innovation ecosystem, they ensure the participation of companies and stakeholders from the system in defining, monitoring and evaluating the priorities for R&I programmes. Their multidisciplinary profile and bottom-up focus make them leading players in the entrepreneurial discovery processes (EDPs) that lead to increasing specialisation, as they identify and generate projects related to specific topics in the leading sectors.

Industrial regions also appear to be making a more intensive use of financial instruments (instead of grant schemes) as part of their efforts to adapt financial mechanisms to the objectives of specific emerging industries, or the transformation process that regions aim to achieve. The underlying rationale behind the use of these instruments can be linked to issues such as existing financial market gaps, the lack of access to financing, and the greater efficiency of the financial instruments (compared with grant schemes) for regional public budgets.

An element that is commonly acknowledged as a key determinant of policy mix implementation success is the existence of a clear communication strategy in terms of how policy support works, under what conditions potential beneficiaries might access support, and the general 'rules of the game' in participating in industrial support policies. The majority of the case study regions have clearly invested in initiatives aimed at improving the level of visibility of their support instruments, reaching out to target populations, as well as the level of understanding of how they work and what they aim to achieve.

All case study regions are involved in European projects and initiatives as part of their work in industrial development. The Interreg programme[1] plays an important role in this respect, with its international, transnational and cross-border strands. Other mechanisms such as the Vanguard Initiative for New Growth through Smart Specialisation, and bilateral agreements, provide a framework for policy learning. However, while some regions appear to participate in these initiatives on a case-by-case basis, others seem to clearly be using international cooperation to drive their industrial policy at home. In these cases, international cooperation not only provides momentum for the implementation of the industrial policy agenda, but it also represents a source of knowledge and inspiration which, in turn, strengthens the capacities of local policymakers and practitioners.

Monitoring and evaluation of regional industrial policy

All the case study regions reported a similar approach to policy monitoring, notably that it is embedded in regional administrative procedures and internal governance. Monitoring processes are conducted at the project or programme level, not at the strategy or policy level (the implementation of which relies on a mix of different policy schemes and projects). However, the evaluation of the case study regions highlights three challenges and weaknesses.

- The governance of evaluation units is weak, as are investments on behalf of regional policymakers in strengthening the capacity (available human resource and skills) of evaluation units within regional administrations. This issue becomes even more challenging to the extent that the evaluation standards in the framework of ERDF 2014–2020 funding have become much more complex.
- Regional policy strategy documents are rarely based on well-developed logical frameworks or theories of change, articulating the regional challenges with the objectives of the policy, the objectives with the outputs, the expected outcomes, and the impacts of the intervention.
- The availability of data at the regional level to monitor specific results and impact indicators is hampering, to a certain extent, the evaluation capacity. The most frequently cited evaluations are conducted as part of the funding obligations of the European structural and investment funds. As a result of this, in general, no specific changes in policy approaches can be attributed to official monitoring or evaluation.

Good practice in regional industrial policy

In addition to the main industrial policy trends observed at the cross-cutting level of the study, several good practices have been identified that tend to illustrate, in practical terms, these overarching trends. However, rather than acting as a common guiding principle for regions seeking to enhance their industrial policy capacity, these examples of good practices (Table 1) could serve as a source of inspiration for the development of innovative industrial policy initiatives.

1 Interreg Europe is an ongoing European-level programme financed by the ERDF to further the sharing of good practices between European regions. The two main support services of Interreg Europe are interregional cooperation projects and policy-learning platforms. Therefore, in addition to funding such interregional cooperation projects, Interreg offers opportunities for sharing good practices of policy design and implementation. The four themes that guide projects and the platform are R&I, SME competitiveness, low carbon economy, and environment and resource efficiency.

Table 1: Overview of selected key good practice

Region	Good practice criteria	Good practice subcriteria	Good practice	Overview
Baden-Württemberg	Policy governance	Multistakeholder involvement	Industrial dialogue	Industrial dialogue and stakeholder participation in strategy development is a specific brand of the industrial and innovation policy of Baden-Württemberg. It involves discussions with businesses, chambers of commerce, associations, trade unions and research, both in the form of sectoral and thematic dialogues. There are four action fields: skilled workers; innovation and funding; location of industry; and bringing industry closer to people.
	Policy mix	Rapid deployment and up-scaling of advance manufacturing technologies	Industry 4.0 for Baden-Württemberg and Allianz Industrie 4.0: Initiative to encourage the uptake of advanced manufacturing solutions by industry	In 2014, the Ministry for Financial and Economic Affairs published a policy document called 'Industrie 4.0 für Baden-Württemberg' concluding that the region already had high potential in advanced manufacturing, and setting a clear framework for policy actions to transform the regional industrial base. Following the production of the policy document, the Allianz Industrie 4.0 was set up to intensify the exchange between industry and technology representatives, so that synergy potentials could be developed within the region. The Allianz Industrie partners want to give priority to SMEs on the transition to Industry 4.0 and to help employees to work in a transformative manufacturing environment.
Catalonia	Policy design	Interregional and international policy-learning	Participation in European level initiatives	Catalonia is involved directly or through projects in existing European level initiatives such as Manunet, EFFRA, SPIRE and 'Clepa' (automotive). Manunet is considered as having been a successful means of aligning funding interregionally for advanced manufacturing. Catalonia secured 20 projects under the last call and considers the experience as a success. Using such existing cooperation to identify interregional value-chains represents an important opportunity for the regional industrial base. It is also involved in the Vanguard Initiative for New Growth through Smart Specialisation, which is an initiative for boosting new growth through bottom-up entrepreneurial innovation and industrial renewal in European priority areas such as advanced manufacturing. Two pilot initiatives are being carried out in the fields of ESM (led by Catalonia, together with Lombardy) and High-performance Production with 3D Printing (with Catalonia as a participator).

Region	Good practice criteria	Good practice subcriteria	Good practice	Overview
Lombardy	Policy design	Setting clear and transparent objectives and adopting an integrated strategic approach	Strategic Document for Industrial Policies 2013-2018	Lombardy has defined a clear-cut industrial policy recognised as such by most regional stakeholders. The cornerstone is the Strategic Document for Industrial Policies 2013–2018, which sets out clear strategic objectives. The document is publicly accessible and covers access to finance, technological development and innovation, and skills enhancement.
	Policy design	Using policy intelligence (through innovative IT tools)	QuESTIO Open Innovation platform	QuESTIO has been created to map the main regional scientific, technical and economic characteristics (research and technology transfer centres, technology clusters, businesses and existing research infrastructures) related to the seven areas of specialisation identified by the S3, plus main topics of Smart Cities and Communities. The purpose of Open Innovation is to help the regional authority administration monitor the development of the RIS3, and to support the definition of technology roadmaps and tailored-made work programmes.
North Brabant	Policy governance	Multistakeholder involvement and cross-institutional collaboration	Bottom-up policy coordination through Top Sector teams	Sector-specific roadmaps are developed by 'top teams' with representatives from industry, a researcher from a knowledge institute, a representative of the government, and a SME. These roadmaps provide action plans and agreements on a sector's development.
Pays de la Loire	Policy mix	Rapid deployment and up-scaling of advanced manufacturing technologies	Technocampuses and regional innovation platforms	The region is developing technology and research and development (R&D) platforms accessible to regional actors (including SMEs) in order to encourage the upgrade and modernisation of productive capacities.
Pirkanmaa	Policy governance	Multistakeholder involvement	Growth Pacts	Part of the taxes collected by central government is allocated to cities through the Growth Pacts. They include a decision on the budget and plan on how the cities wish to spend the money. The cities are free to come up with their own policy development goals and support measures, but they are stress tested at the national level.
	Policy mix	Practical skills enabling industrial change	Demola Tampere	Demola is an international organisation that facilitates co-creation projects between university students and companies, either locally or internationally. It is a network of various partners including universities, their faculties, researchers and students, as well as companies and local agencies. There are a growing number of Demola centres around the globe. It is international and interdisciplinary.
Pomorskie	Policy design	Supporting the 'entrepreneurial discovery' process	Competition-based approach to identify smart specialisation areas	The agenda setting of the smart specialisation strategy in Pomorskie has been unique – it was the only Polish region where an open competition for the identification of development areas around certain industries was published, and a transparent bottom-up approach adopted. Pomorskie successfully applied a negotiation approach based on the participation and involvement of various partner institutions, entities and communities. Some 400 entities have been involved in the process. The available financial resources have been an important incentive to ensure stakeholders' participation.

Region	Good practice criteria	Good practice subcriteria	Good practice	Overview
Sardinia	Policy governance	Cross-institutional collaboration	Unitary programming	Unitary programming involves regular meetings at both the political and technical level, in order to coordinate and agree on the main policy issues that affect multiple ministries. It enables all available resources to be allocated according to policy priorities and objectives; it also significantly improves policy programming.
West Romania	Policy mix	Practical skills enabling industrial change	Regional Competence Centre for Supplier Development in the Automotive Sector	The local government body of Timisoara, together with the West Regional Development Agency (West RDA), initiated a competence centre to develop infrastructure for testing and product development for cooperative projects among companies in the automotive sector. An important component is also the development of training sessions for the regional workforce in new fields needed by automotive sector companies. The centre has finished its investment phase (2012–2015) and is currently setting up the training platform. It is still at an early stage, but the development of the centre is a good practice related to the response to the regional industry's need for a trained workforce and product development spaces.

Source: *Technopolis Group.*

In broad terms, the potential for transferability of the majority of these good practices depends on the capacity and ability of regions to design and implement industrial policy initiatives. In other words, having a minimum level of power over industrial development is one of the key preconditions for any region to import or replicate any of the identified good practices. Good practices can generally be classified into six categories, based on their conditions and potential for transferability:

- those that can be adopted in regions at any development phase or institutional setting (development or institutionally-neutral good practices);
- those that require a high level of autonomy in economic and industrial policy;
- those requiring strong involvement of national or central governments in economic and industrial policy;
- those requiring the existence of a community of stakeholders with prior involvement in regional industrial policy development;
- those that require the existence of technical skills and capacities within the host region;
- those requiring strong financial commitments and investments.

Introduction

The objective of this overview report is to synthesise and compare industrial policy capacity within eight European case study regions, which have been analysed as part of the pilot project called Future of Manufacturing in Europe: Developing Regional Industrial Policy Capacity. The case study regions comprised:

- Baden-Württemberg (Germany);
- Catalonia (Spain);
- Lombardy (Italy);
- North Brabant (the Netherlands);
- Pays de la Loire (France);
- Pirkanmaa (Finland);[2]
- Pomorskie (Poland);
- West Romania (Romania).

In addition, this overview report draws from information presented in a regional case study on Sardinia (Italy) developed by an expert on behalf of Eurofound. This additional case study followed the same structure and methodology as the eight case studies conducted by Technopolis Group. While relevant and comparable information regarding policy design and implementation can be drawn from this case study, it should be highlighted that Sardinia is not a major manufacturing region; hence some inherent differences between Sardinia and the other analysed regions must be considered. However, henceforth, the total number of studies referred to throughout this report is nine (unless stated).

The Future of Manufacturing in Europe pilot project was proposed by the European Parliament and delegated to Eurofound by the European Commission (DG Internal Market, Industry, Entrepreneurship and SMEs). The study on Developing Regional Industrial Policy Capacity is one of several studies being conducted as part of this pilot project.

In addition to these research projects, a series of Regional Industrial Policy Seminars (RIPSs) were set up in order to foster policy learning among relevant stakeholders at the regional, national and European level. Findings from these seminars are incorporated in this report where appropriate. The first of these seminars took place in Gothenburg and Trollhättan (Sweden) between 25 and 27 May 2016 under the heading 'Regional industrial policy after a large manufacturing plant closure'. Seminar participants were asked to fill in a standardised questionnaire to gather information about their networking activities related to the regional policy process (for example, the type of actors they are contacting, frequency and relevance of these contacts, issues and topics covered, and hindrance factors for enhanced networking). Some 15 responses have been received and analysed by Eurofound, with selected results included in this report as illustrative examples. The second RIPS took place in Donostia/San Sebastián (Spain) between 28 and 29 November 2016 and dealt with skills and smart specialisation – policies and practices.

This synthesis report identifies key policy issues and practices of regional industrial policy capacity along the policy cycle such as policy design, governance, implementation, monitoring and evaluation. The case studies carried out as part of this study aim to illustrate how regional industrial policy is interpreted in different regional settings across the EU, how it is coordinated, implemented and evaluated. The specific research questions addressed by the case studies and thus the synthesis report were:

- What is the existing industrial policy capacity in EU regions, with special emphasis on managing industrial modernisation related to manufacturing?
- What are the key components of industrial policy (involved actors, policy areas and instruments)?
- What kind of good practices in regional industrial policy can be identified, with a focus on future-orientated manufacturing?
- What are the success factors in regional industrial policy (capacity) and factors that facilitate/hinder regional industrial policy success and capacity building?
- How to further develop the current industrial policy capacity.

Case study regions have been selected from a long list of regions (case studies are published as working papers on the FOME website) developed on the basis of an extensive literature review and indicator analysis, expert interviews and the use of a number of selection criteria (such as geographic, economic and demographic) to ensure a balanced mix of regions, particularly in terms of geographical distribution (north versus south, east versus west, inland versus coastal, inland versus border), size (surface and population) and the urban versus rural dimension. Annex A sets out the good practice criteria used to analyse the different case study suggestions, allowing for a comparative analysis of the key social, economic and geographical characteristics of the case study regions.

As illustrated in the study, one of the cross-cutting issues of all of the selected regions is the predominance of the manufacturing sectors within the industrial landscape, in terms of both share of regional gross domestic product, and employment. An open definition of 'regions' has been adopted for this study which can include the Nomenclature of Territorial Units for Statistics (NUTS2, NUTS3) or other functional regions (see Box 1).

2 This case study included a specific focus on the region's capital city of Tampere.

Box 1: The concept of regions

A region may be defined in administrative terms as it is, for example, by Eurostat's NUTS classification. The NUTS classification has three hierarchical levels based upon minimum and maximum thresholds for the population size of the region (Eurostat, 2015).

However, regions can also be defined in functional economic, labour market or social terms, such as by the functional urban areas classification of the OECD which takes into consideration travel-to-work flows (OECD, 2013).

Indeed, the administrative and economic/labour market/social demarcation of regions do not always match. OECD (2007) highlights cross-national business clusters – border regions realising formal or informal policy arrangements or the restructuring (notably merging) of administrative units as examples for why this comes about.

Case studies have been conducted on the basis of an extensive literature review and an in-depth study visit to each of the selected regions. During each of these visits, case study authors conducted approximately 10 semi-structured interviews with a range of regional stakeholders including regional governments, private sector representatives, business organisations and trade federations, regional financing institutions, employee organisations and trade unions. A total of 100 interviews were carried out in the framework of this project from mid to late 2016. Interview guidelines used to conduct these interviews were common to all the case study regions. A common analytical framework was built at the outset of the study, shaped around the list of good practice criteria (see Annex A), which was subsequently used throughout the entire study.

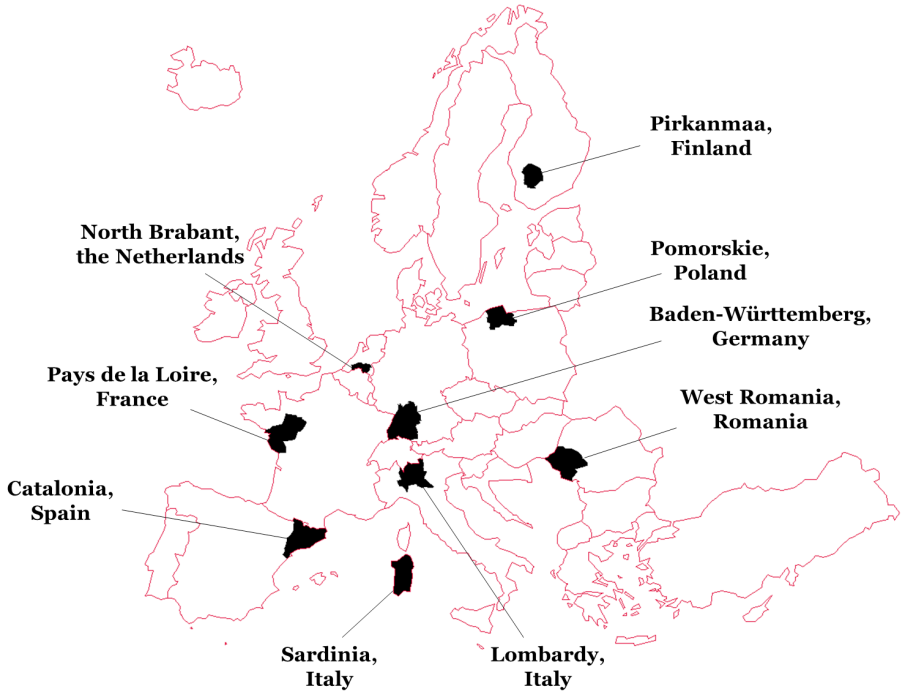
This report is structured around the following chapters:

1. Main economic and labour market characteristics of the case study regions
2. Regional policies for industrial development
3. Policy governance
4. Policy implementation
5. Monitoring and evaluation
6. Good practices and their transferability

1 Main economic and labour market characteristics of the case study regions

The study analysed nine European regions: Baden-Württemberg (Germany), Catalonia (Spain), Lombardy (Italy), North Brabant (the Netherlands), Pays de la Loire (France), Pirkanmaa (Finland), Pomorskie (Poland), Sardinia (Italy) and West Romania (Romania) (Figure 1).

Figure 1: Location of case study regions



Source: *Technopolis Group.*

The nine regions are diverse in terms of their size, geographical location, economic development and innovation performance (Table 2).

The regions represent all corners of the EU, with one in the north, three in the south, two in the east and three in the west. Their total populations range from close to 11 million inhabitants in Baden-Württemberg to just over 0.5 million in Pirkanmaa. Among the highest regional gross domestic products (GDPs) are those of Baden-Württemberg and Lombardy, while that of West Romania is the lowest.

Although all of the regions have recorded growth in their overall populations (over the past five years), they have also witnessed shrinking populations of individuals under 30 years of age (according to Eurostat data). This is in line with general European demographic trends.

Regional disparities in terms of employment and unemployment rates are significant. While regions such as Baden-Württemberg have a 77% employment rate and 3% unemployment rate (Eurostat, 2015), other regions such as Sardinia stand at 50.1% and 17% respectively. Most of the remaining regions are either below or at the same level as the EU averages in terms of both employment and unemployment – 66% and 9% respectively (Eurostat, 2015). Changes in employment and unemployment rates over the past five years vary significantly across all regions.

Key indicators on the availability of qualified human resources and skills paint a diverse picture of the selected regions. In terms of the share of the population with tertiary education, for example, selected regions do not display particularly high levels compared with the European average (33%). Only Pays de la Loire and Pirkanmaa record higher than EU average shares of tertiary education populations. The share of regional populations employed in science and technology (as a percentage of the active population) among case study regions are, in general, slightly above the EU average of 30.9% in 2015 (Eurostat, 2015). Only Lombardy and West Romania underperform in this field compared with the EU average.

Table 2: Overview of geographical and territorial dimensions of selected regions

	Region	Urban versus rural dimension	Geographical situations	Key cities
1	Baden-Württemberg	Intermediate region Secondary metro region	Western European region Internal border region (bordering France and Switzerland) Inland	Stuttgart Freiburg Heidelberg
2	Catalonia	Intermediate region Secondary metro region	Southern European region Internal border region (bordering France) Coastal	Barcelona Tarragona
3	Lombardy	Intermediate region Secondary metro region	Southern European region Internal border region (bordering Switzerland) Inland	Milan Brescia Monza
4	North Brabant	Predominantly urban region Secondary metro region	Western European region Internal border region (bordering Belgium) Inland	Eindhoven Tilburg Breda
5	Pays de la Loire	Intermediate region Secondary metro region	Western European region Coastal	Nantes Angers
6	Pomorskie	Intermediate region Secondary metro region	Eastern European region Coastal	Gdańsk Gdynia Sopot
7	Sardinia	Predominantly rural region Non-metro region	Southern European region Island	Cagliari Sassari
8	Pirkanmaa	Intermediate region Secondary metro region	Northern European region Inland	Tampere
9	West Romania	Intermediate region Secondary metro region	Eastern European region Internal/external border region (bordering Hungary and Serbia) Inland	Timisoara Arad

Source: *Technopolis Group.*

All of the regions analysed (with the exception of Sardinia) are, in general, industrial and manufacturing powerhouses of their respective countries. However, several have witnessed a strong deindustrialisation process recently, which was often catalysed by the recent economic and financial crisis. Lombardy, Pays de la Loire and Pirkanmaa are three regions which witnessed a drop in the share of employment in manufacturing (-0.5%, -2.1% and -7.7%, respectively) between 2011 and 2015 (Eurostat, 2015), and in their regional gross value added (GVA) in industry between 2009 and 2013 (-0.1%, 0.0% and -2.06% respectively (Eurostat, 2015). Nevertheless, these figures increased in the case of North Brabant, West Romania and Pomorskie (+1.7%, +3.6% and +4.5% respectively) between 2011 and 2015 for the share of employment in manufacturing, and +2.2%, +1.4% and +2.3% respectively for the share of manufacturing in the GVA between 2009 and 2013 (Eurostat, 2015). The share of employment in manufacturing remained stable in Baden-Württemberg and Catalonia.

The regions vary in terms of their economic structure. Some of the regional economies, such as North Brabant and Pirkanmaa, have been heavily dependent on one key company such as Philips, which is critical to North Brabant, and Nokia which used to be a key driver in Pirkanmaa – though since Nokia moved out of the region the economy has become much more diversified. Other regions such as Baden-Württemberg, Catalonia and Lombardy are diversified with a mix of large companies and small and medium-sized enterprises (SMEs). Innovation performance also varies, with North Brabant being the most high-tech region and West Romania the least performing (Table 3).

Table 3: Innovation performance of case study regions

Region	Regional Innovation Scoreboard category (2015)	Innovation and entrepreneurship ranking of the Regional Ecosystem Scoreboard
North Brabant	Innovation leader	93% of the best value
Baden-Württemberg	Innovation leader	91% of the best value
Pirkanmaa	Innovation leader	90% of the best value
Pays de la Loire	Innovation follower	84% of the best value
Catalonia	Moderate innovator	71% of the best value
Lombardy	Moderate innovator	67% of the best value
Pomorskie	Moderate innovator	67% of the best value
Sardinia	Modest innovator	60% of the best value
West Romania	Modest innovator	53% of the best score

Source: *Regional Innovation Scoreboard and Regional Ecosystem Scoreboard (European Commission, 2015).*

Some of the most prominent clusters across the case study regions include machinery, metalworking, biopharmaceuticals, agro-food, electronics and plastics. At the same time, diversified industrial bases tend to be one of the key strengths of the strong manufacturing regions in the study. Catalonia, for example, has a rather diversified industrial base as no single sector amounts to more than 15% of the total industrial turnover, something that has traditionally contributed to the economic resilience of the region. In Baden-Württemberg, industry is also based on a great diversity of productive sectors, illustrated by the number of clusters and networks in the region (79 clusters, 85 cluster initiatives and 29 region-wide networks and regional agencies across different sectors).

Several emerging industries have also gained importance in the industrial landscapes of the case study regions. Creative industries such as design, advertising and games, for example, have gained importance in Baden-Württemberg and Pays de la Loire, while mobility technologies such as smart, safe and connected vehicles are among key emerging industries in Baden-Württemberg, Catalonia, Lombardy and Pirkanmaa. In Pomorskie and West Romania, however, the importance of emerging industries remains limited.

2 Regional policies for industrial development

Scope and objectives

Understanding of industrial policy in the regions

Box 2: Historical development of the orientation of regional industrial policy in Europe

After World War II, European industrial policy mainly aimed at developing a large manufacturing base for emerging industries such as steel, automotive and chemical industries (Pianta, 2014), driven by the productivity gap between Europe and the USA, and achieved through national intervention targeted at specific industries and companies, such as the promotion of mergers and targeted subsidies (Owen, 2012). Around the same time, regional policy started to evolve in Europe as a result of the area-targeting experience of the European Coal and Steel Community (McCann and Ortega-Argilés, 2013).

In the 1980s to early 2000s, more horizontal, non-selective industrial policies were implemented, emphasising the development of the overall business environment and an increased focus on competitiveness (Owen, 2012). This resulted in more limited direct state intervention (Grabas and Nützenadel, 2013). As for regional policy, these decades were characterised by the establishment of a cohesion policy, aimed at reducing social and economic disparities within the EU by supporting weaker regions (McCann and Ortega-Argilés, 2013).

Since the economic and financial crisis started in 2008, the tendency of governments was not to intervene. This came somewhat to a halt as governments saw a need to financially support hard-hit industries, such as car manufacturing (Eurofound, 2009a; Owen, 2012), raising concerns that it could result in situations in which governments were encouraged to distrust market-based solutions, promote national champions and interfere in free markets (OECD, 2009). Accordingly, a growing consensus seems to be that governments should act as coordinators between economic actors; encouraging growth and job creation, and fostering the sustainability of the EU economy (European Commission, 2010; Warwick, 2013).

The most recent development at European level, relevant for regional industrial policy, is the European Union's smart specialisation strategy. It is based on the understanding that a 'one size fits all' policy approach is not feasible across all regions of the Member States, taking into account the differing institutional and governance systems, and differences in economic performance and development (McCann and Ortega-Argilés, 2013). It argues for a regional industrial policy approach based on the region's core activities, by encouraging an entrepreneurial discovery process (EDP) (that is, a bottom-up approach) and the establishment and use of regional networks and knowledge (Froy et al, 2011; Perianez-Forte and Cervantes, 2013). Accordingly, regions should specialise in sectors in which they have the highest growth potential (European Commission, 2014a), while at the same time diversify around a core set of activities and themes that cross sectors (McCann and Ortega-Argilés, 2013).

The results of the case studies showed that, although the term 'industrial policy' is widely recognised and acknowledged, many regional policy practitioners and stakeholders were unable to define the exact scope in practical terms (for example, in the sense of what policy instruments it covers, or which government/agencies are in charge of delivery). Nevertheless, in spite of this somewhat blurred definition or understanding of the concept, a finding that emerges from both the case studies conducted in this project and from the first RIPS is the importance of a shared regional vision, transposed into joint objectives by the involved stakeholders for their region's development.

In most of the cases, regional industrial policy is embedded in the broader regional development policy framework. For instance, in Pirkanmaa and Sardinia, regional actors talk about economic or development policies and do not use the term 'industrial policy', as such. Both the regional and individual municipal strategies cover all aspects of regional development. Support for industrial development represents an important dimension in all strategies, but the strategies also cover other topics such as education, the labour market and infrastructure. Similarly, in West Romania, the most used terms when referring to supporting the industry are 'regional development' and 'cluster development'.

In some cases, larger regions with enough resources and their own financial means, such as Catalonia and Lombardy, have developed a set of policy documents that explicitly define industrial policy. The current Catalan industrial policy was launched in 2014 with the slogan Industrial Catalonia: A Shared Objective, while Lombardy adopted the Strategic Document for Industrial Policies 2013–2018. However, in other large regions, such as Baden-Württemberg, industrial policy emerges at the interface of technology, innovation, structural, research and science policies, and is not shaped by one single industrial strategy. Most often, industrial policy does not represent a stand-alone bundle of policies or programmes. In fact, the term industrial policy is seldom used in strategic policy documents; nor can it be linked to a specific policy document or strategy. Instead, policy initiatives that support industrial modernisation form part of the overall strategy for regional economic development,

and are embedded in a multiplicity of policy sources that address a broad set of development goals. In Pays de la Loire, support for industrial development appears in a set of regional integrated economic and innovation strategies and plans. Similarly, in Baden-Württemberg, there is no targeted top-down industrial policy, but rather a set of policies in support of SMEs and innovation, and a multitude of loosely coordinated activities and accompanying measures.

The general policy orientations of the case study regions can be summarised as follows.

- **Catalonia's** industrial policy has a strong orientation towards fostering entrepreneurship to develop the industrial base and encourage the emergence of knowledge-based sectors.
- **Baden-Württemberg's** industrial policy focuses on the promotion of SMEs. It is strongly linked to the regional innovation policy, which is based on long-term university research and technology policy that covers the entire innovation process from basic research to application-orientated research, technology transfer to product development, and vocational and scientific education and training. A key focus of the regional innovation policy for the past 15 years has been the systematic networking of innovation players and the development of an independent cluster policy.
- **Lombardy's** industrial policy is a mix of traditional policy fields such as research and development, innovation, support of SMEs and entrepreneurship, alongside measures aimed at improving the business environment including fiscal simplification, the reduction of administrative burdens, and strengthening administrative efficiency.
- **North Brabant's** Top Sector policy drives regional industrial policy, which is mostly focused on innovation, promotion of entrepreneurship, improvement of the business climate, attracting talent and internationalisation.
- **Pirkanmaa's** emphasis is on entrepreneurship, innovation, finding new industrial niches, and promoting skills and internationalisation.
- **Pays de la Loire's** key priorities are the adoption of a value chain approach and prevalence of SMEs in traditional and emerging sectors, innovation as a key tool to address the challenges of a transforming economy and internationalisation.
- **Pomorskie's** regional economic development policy has been focused on improving the value chain position of the region, increasing the level of investment in enterprises and supporting the development of specific industrial clusters.
- **West Romania's** industrial policy is embedded in regional development and cluster policies. It focuses on R&D, commercialisation of knowledge, entrepreneurship and internationalisation.
- **Sardinia's** focus is on improving the business environment, research and technology development, and promotion of innovation.

These main features of regional industrial policy are more or less in line with the European or OECD definitions for industrial policy. The 'European industrial policy aims to stimulate growth and competitiveness in the manufacturing sector and the EU economy as a whole', including priorities such as trade, innovation and energy (European Commission, 2016). The OECD definition is

> *any type of intervention or government policy that attempts to improve the business environment or to alter the structure of economic activity towards sectors, technologies or tasks that are expected to offer better prospects for economic growth or societal welfare than would occur in the absence of such intervention.*
>
> (Warwick, 2013).

The objectives for growth and competitiveness are also important in the regional economic development programmes. The improvement of the business environment, as underlined by the OECD definition, is again an important aspect in all case study regions.

Unsurprisingly, the range of policy areas considered under different regional industrial policy frameworks varies considerably across the case study regions due to their different regional specificities. The most commonly associated policy areas include innovation and business research, clusters, SMEs and entrepreneurship. In a few cases, regional marketing and investment promotion – typically also covering foreign direct investment (FDI) activities – and spatial development are policy areas which are considered to be under the industrial policy umbrella.

In the majority of the case study regions (Baden-Württemberg, Lombardy, North Brabant, Pirkanmaa and West Romania), industrial policy is strongly linked to regional innovation policy. Given that regions often do not have industrial policy intervention tools such as state aid or regulations to hand, it is, for example, their competence in regional SME and innovation policy that is used for regional industrial development – the Pays de la Loire economic policy is closely coupled to the support for innovation, fostering the development of high-technology sectors and triple helix partnerships.

The importance of innovation in industrial policy specifically, also comes from the fact that industrial modernisation and advanced manufacturing depend on the innovation capacities of regional companies. Baden-Württemberg's regional innovation policy is focused on support and investment activities that address key regional priorities in order to permanently ensure a knowledge-based development of the region.

This research also found that other important policy domains such as education and training, employment, infrastructure and social development/inclusion are, in general, indirectly addressed under the framework of industrial policy. The decisions about these important areas usually belong to different government departments, although they have important implications for industrial development. That said, in the case study regions there are several examples of how regional development policy intends to influence decisions on education curricula or substantial infrastructure developments. Competition and labour market policies

are generally in the hands of national level bodies (in the case studies under review) and therefore do not form part of regional industrial policies.

Policy challenges addressed by industrial policies are also diverse, ranging from the competitiveness of SMEs, shortage of financing, shortage of skills and internationalisation, to value chain position. For instance, in Lombardy, industrial policy relies on a mixed approach of traditional fields such as R&D, innovation, support for SMEs, and entrepreneurship, alongside measures aimed at improving the business environment such as fiscal simplification, reduction of administrative burdens and strengthening administrative efficiency. The definition of regional industrial policy is also linked to the governance setting and the types of stakeholders or decision makers involved in the agenda-setting process.

Table 4 provides an overview of the policy areas that are relevant for industrial development and the extent to which the case study regions address these areas.

Table 4: Overview of policy areas addressed in the case study regions

	Baden-Württemberg	Catalonia	Lombardy	North Brabant	Pays de la Loire	Pirkanmaa	Pomorskie	Sardinia	West Romania
Entrepreneurship and SMEs	XX	XX	XX	XX	XX	XX	XX	XX	XX
Cluster policy	XX	XX	XX	X	XX	X	X	X	X
Innovation policy	XX	XX	XX	XX	XX	XX	XX	XX	XX
Education and skills	X	X	X	X	X	X	X	X	
Trade and internationalisation	XX	XX	XX	XX	XX	XX	XX	XX	XX

Note: *xx = highly relevant, x = somewhat relevant.*
Source: *Technopolis Group.*

Focus and nature of policy interventions on industrial manufacturing

In some of the case study regions, the economic development strategies clearly state the political desire to maintain the industrial base, such as in Baden-Württemberg, Catalonia, Lombardy and Pays de la Loire. In Baden-Württemberg, the regional ministry published guidelines following the dialogue with industry in which they outline a set of actions and state the objective of keeping and strengthening the existing manufacturing base. Similarly, in Pays de la Loire, the regional RIS3 strategy explicitly states that financial resources will be allocated to support reindustrialisation. At the same time, these regions are also conscious that the future of their manufacturing industries depends on their innovative potential, on digitalisation and in moving towards bundled product-service offerings.

In other regions, policymakers no longer focus on manufacturing and are more inclined to diversify the economic structure and develop their economy in new services-orientated activities, such as in North Brabant, Pirkanmaa and Pomorskie. In West Romania, the regional specialisation strategy highlights the key industrial niches that can drive development, which are software development within ICT, machine building within the automotive sector, clothing design, agro-food, urban regeneration, energy efficiency, health, and conference tourism. Besides the element of diversification and a focus on increasing the value chain position of their industries, there is no specific statement on keeping a region's industrial character.

The type of support for manufacturing industries and the extent of industrial policy intervention also depend on how the regions regard the role of government, at both regional and national level. In some regions, such as Baden-Württemberg, North Brabant and Pirkanmaa, there is a firm belief that industrial development should be driven by industry and that government should play a less determining role. The case study on Baden-Württemberg found that policymakers are of the opinion that industry has always been strong and that this is why a bold intervention was never necessary. From another perspective, the North Brabant case study interviews pointed out that provinces where public support (financial) is higher than private sector support, in some instances perform worse than other regions with a more *laissez-faire* policy characterised by lower levels of government intervention. This might suggest that government money can even hinder an entrepreneurial spirit, which is why, in these regions, policymakers are not in favour of providing direct incentives to specific companies. They would rather put the emphasis on fostering a positive business environment and creating the right economic framework conditions.

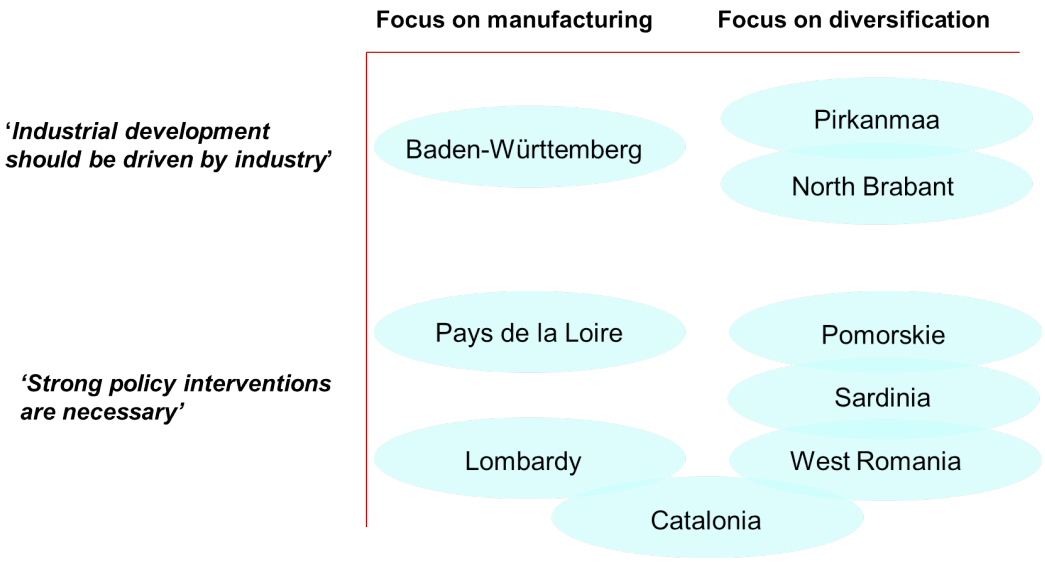
In other regions, there is a more widespread view that government plays a key role in supporting industrial development. In these cases, there tends to be a much higher expectation of the intensity of government involvement in the design and implementation of industrial policy. Higher degrees of acceptance of government intervention in this policy field, in particular country and regional settings, are best illustrated by strong direct interventions of national governments in favour of industrial development. For example, in France in 2003, the Alstom Group, which had been in a poor financial state since 1998, was facing a liquidity crisis that led it into bankruptcy. A first rescue plan was drawn up by the economy minister,

but it was blocked by the European Commission. In 2004, the then French president Nicolas Sarkozy made rescuing Alstom his priority and succeeded in having a new plan accepted for partial renationalisation. Since then, the central government has put technologies, competition, support for SMEs and innovation at the heart of its efforts. The New Industrial France plan, launched in 2013, is yet another example of the predominant role central government has given efforts to reindustrialise France.

In West Romania, the national government, as of 2017, intervenes directly with industry support. The government provides favourable credits and loans, co-financed by the European Investment Bank, to essential vehicle manufacturers, or other strategic sectors, as part of a state aid package. In the automotive industry, which has a significant share in regional employment and value added, the national government stimulated new car sales with the aid of a scrappage programme in mid-2000. Since such interventions are still seen as positive in Romania for preserving or creating regional employment, regional policymakers lobby the national government to support companies in their specific territory.

Figure 2 classifies the nine case study regions in terms of two extremes in policy approach and the main focus of economic development. The level of intervention in industrial development refers to what extent regions intervene in industrial development and whether they wish to play an active role in shaping economic development, or whether to give a freer hand to local enterprises and focus on improving the business environment they operate in. Catalonia and Lombardy, as of 2017, have a fairly 'government-heavy' industrial policy. The reality is of course more nuanced, for instance Catalonia pays great attention to the diversification of its economy even if it has a clear mandate on strengthening its industrial base. In Pirkanmaa and Pomorskie, the regional governments support their manufacturing industries such as machinery or maritime shipbuilding even if they have put greater emphasis on developing emerging industries.

Figure 2: Focus and approach to industrial development in the case study regions



Source: *Technopolis Group.*

Smart specialisation versus smart diversification

There is very strong overlap and complementarity between industrial policy orientations and RIS3s adopted by regions as a condition for allocating ERDF grants. RIS3 plays a more important role in regions that depend on European funds in terms of financing their regional development policies, and these strategies are either considered to be the main policy source of regional industrial policy, or are seen as one of its key components. In regions such as North Brabant and Pirkanmaa, the smart specialisation strategy is not something new, but it documents objectives formulated previously. In many cases, RIS3s have been developed in parallel with the updating or designing of industrial policy-related documents and instruments, which have enabled strong levels of complementarity. However, smart specialisation means different things to different regions.

While some of the case study regions focused on specialising in selecting specific industries or themes, other regions translated this concept more as 'smart diversification'. Pays de la Loire developed its RIS3 priorities around the theme of accelerating changes in industry and promotes leading industries such as aeronautics, automotive and railways, which are traditional to the region. Sardinia's smart specialisation strategy is centred on traditional sectors (agro-food, tourism), sectors developed in the 1990s (ICT), and newly emerging ones (smart grids for efficient energy management, aerospace and biomedicine). West Romania's smart specialisation areas are the automotive sector, textiles, agro-food, ICT and construction. One of the key characteristics of the regional industrial policy in Catalonia is that, for the first

time, it is sector-specific on the basis of the RIS3, which was adopted in 2013. The aim of sector strategic programmes is to encourage Catalonia's industrial base to move to activities with greater added value and to facilitate the generation of business and framework projects that stimulate competitiveness. In terms of governance, it is also expected that this sector-based approach will allow for better coordination with the horizontal activities of Catalan industrial policy, such as internationalisation support, cluster policy and industrial reactivation. The thematic strategic programmes cover seven sectors, four of them specifically linked to manufacturing.

In contrast, Pirkanmaa and Pomorskie do not consider smart specialisation as adopting a specialised approach on a selected list of themes or clusters. In Pirkanmaa, for instance, the importance of industrial diversification and the relevance of industrial policy have actually increased over the last few years due to the departure of Nokia and downsizing in Microsoft, and also due to the globalisation of manufacturing, which puts enormous pressure on the local industrial base and requires more policy action.

Regional strategies

Pirkanmaa focuses on a regional ecosystem, allowing innovation to emerge wherever local talent might drive new business development. The objective is not to create a biotech or digital city, but to let industrial players work out for themselves how they want to develop, and to let them decide what type of platforms they want to create. The smart specialisation strategy of Pirkanmaa is meant to improve the competitiveness and resilience of the regional manufacturing industry as well as to renew its business models, where service innovation and digitalisation are particularly highlighted. The selected priority domains are not narrow industrial sectors, but what people in the region call 'ecosystems' and are linked to smart mobility, smart housing and infrastructure, industry renewal, and advanced treatments of human spare parts[3]. They reflect existing strengths and focal points for strategic initiatives in the region. Industrial renewal is meant to become more than the adoption of new technologies, but it also includes a reassessment and restructuring of the whole industrial process ranging from production to distribution, and also societal, cultural and educational aspects.

In Pomorskie, regional policymakers look at smart diversification rather than smart specialisation, meaning that those new economic activities or technological niches are explored where the region has a unique expertise and which is the source of new growth. The aim of their RIS3 strategy is to indicate priority directions for the economic development of the region, which may become drivers of economic growth through the development of innovative products and services that are competitive on an international scale. Two smart specialisation areas are specifically relevant for the manufacturing industry; offshore, port and logistics technologies (blue economy), and eco-effective technologies (green economy).

In Baden-Württemberg, no specific smart specialisation strategy has been designed. Industrial policy has always been characterised by the promotion of SMEs (*Mittelstand*) and orientated towards the development and consolidation of economic and social structures. SMEs are defined differently in Germany[4] and some specific forms such as family-owned industrial SMEs, suppliers to larger companies and gazelles[5] are seen as specific drivers of industrial development. A central focus of the regional industrial policy has been on territorial development and promotion, although certain technologies received stronger support than others.

In Sardinia, industrial policy was traditionally characterised by a strong horizontal dimension, meant to improve the business environment in general. As a consequence of the new RIS3 strategy introduced by the EU as a precondition for receiving structural funds, Sardinia has also concentrated resources on specific production and technological niches with strong growth potential.

However one looks at 'smart specialising or diversifying' the economy, the case study regions' policies have a common feature in that they all focus on the specific regional characteristics and that their policy choices are based on an extensive review of the regional endowments, potential and opportunities.

Open and collaborative environment for industrial development

Several of the case study regions, Baden-Württemberg, Lombardy, North Brabant and Pirkanmaa, put an emphasis on creating an open and collaborative regional ecosystem in which businesses can thrive. The underlying policy concept is that the success of regional economic policies depends on their ability to create business conditions that can give the location a lasting advantage and to strengthen the resilience of the regional ecosystem (European Commission, 2015). A term that recently gained much popularity, related to regional innovation ecosystems, is resilience. Regional innovation ecosystems are, as any system, prone to external shocks, endogenous breakthroughs or political changes (Martin and Sunley, 2013) that can negatively influence the regional development path and make certain industries, or the entire regional economy, decline leaving desperate socioeconomic conditions.

3 The Human Spare Parts programme researches stem cells in order to develop technologies and solutions, which in the future will lead to new therapies and drugs.

4 Mittelstand is defined as SMEs (*kleine und mittlere Unternehmen*) with annual revenues up to €50 million and a maximum of 499 employees. The term is not officially defined or self-explanatory hence, in English linguistic terms, SMEs are not necessarily equivalent to the Mittelstand. In fact, even larger companies (often family-owned) claim to be part of the Mittelstand, based on the Mittelstand's positive connotations.

5 Gazelles are companies having an annual growth rate of 20% or more as measured in sales revenue. Typically, these are small publicly traded companies that have sustained this growth for each of the past four years, beginning with sales of at least $1 million. Also, gazelle companies usually are known for creating many new job opportunities. (Business Dictionary)

Box 3: Regional resilience after the crisis: The cases of Spain and Italy and findings from Eurofound's RIPS

The economic crisis had differing effects not only on different Member States, but also on different regions within them. One such example of differing levels of regional resilience is Spain: while all regions suffered from the crisis, some regions have shown a 'resilience capacity' to overcome the negative effects of the crisis (Cuadrado-Roura and Maroto, 2016). It was found that the most resilient regions were those that had specialised in dynamic and productive industries such as energy, some manufacturing, and some advanced market services (including transport, communications, and business and professional services). The resilient regions had already specialised in these industries before the crisis, which could explain why they were able to recover so quickly (Cuadrado-Roura and Maroto, 2016).

In Italy, regional resilience has also differed substantially from region to region, not only since the most recent economic downturns, but also during past crises. Regions in the north, especially those in the Adriatic belt, generally proved more resilient than regions in the south. Industrialisation and manufacturing activities were found to be important contributors to regional resilience. In particular, the long-term effect of manufacturing activities and their impact on regional resilience were stressed in relation to increasing returns to scale for manufacturing including 'dynamic learning effects, self-reinforcing expectations and the quasi-irreversibility of investments' (Martin and Sunley, 2013 in Di Caro, 2014).

Eurofound's RIPS, focusing on regional industrial policy after a large manufacturing plant closure, also offered some interesting insights into regional resilience. Cases of large-scale restructuring[6] discussed with stakeholders from the regional, national and European level at this seminar included SAAB in Sweden (Eurofound, 2011), the Odense Steel Shipyard in Denmark (Eurofound, 2009b), Nokia (Eurofound, 2016a) and Microsoft in Finland (Eurofound, 2016b), and Opel in Germany (Eurofound, 2014). The RIPS took place in Gothenburg and Trollhättan, the Swedish region that underwent severe restructuring following the closure of the SAAB automobile manufacturing plant in 2011, with the result that more than 3,000 workers were made redundant. However, the impact of the restructuring was mitigated by the collaborative action of different national, regional and local stakeholders. Early mobilisation of institutional actors and established cooperation models were highlighted as success factors during discussions, as well as acting quickly and providing high-quality services to affected workers and regional companies. Another aspect was that due to previous restructuring at the company, stakeholders were already aware of each other. This facilitated cooperation once the worst-case scenario of the large-scale restructuring materialised, contributing to regional resilience in light of the crisis.

Internationally open industrial platform approach

North Brabant and Pirkanmaa are regions that especially promote an internationally open industrial platform approach. Contrary to traditional cluster policies where the focus was put on cooperation between companies and research organisations, and on fostering research and innovation (R&I) projects, the platform approach stresses the importance of communities, talents and global ecosystems. Their position naturally drives this way of thinking, since both regions are relatively small and very much dependent on international markets. North Brabant pays specific attention to promoting entrepreneurship, pro-active policies stimulating the knowledge economy, space for innovative activities, and good transport accessibility. As the case study found, regional stakeholders believe that supporting the broader ecosystem through a social agenda contributes to a good business climate, which requires making connections between the economy and broader social priorities. Policymakers in the region often refer to the open culture of North Brabant and the leading position that its companies have taken in promoting open innovation, where suppliers and similar companies are looked at as both competitors and partners.

In North Brabant, open innovation and an open innovation ecosystem are important drivers for framing government policy, which sees the triple helix partnerships as central to industrial competitiveness. The concept of the 'triple helix' of university-industry-government relationships was coined in the 1990s by Etzkowitz (1993), and Etzkowitz and Leydesdorff (1995). The triple helix thesis is that the potential for innovation and economic development in a knowledge society lies in a more prominent role for the university, and in the creation of hybrid elements from university, industry and government to generate new institutional and social formats for the production, transfer and application of knowledge (Triple Helix Research Group, undated).

Improving the value chain position of regional industry

In less developed regional economies, such as Pomorskie and West Romania (also as a result of their past and economic structure), the recent policy focus has been put on improving the value chain position of the regional industry. Many central eastern European regions face the middle-income trap, meaning that they cannot continue to compete on a basis of low wages. However, it is hard to break out of the circle and reach the level of knowledge-based economic development. This is why investments in domestic companies and in knowledge-based activities play such an important role. In Pomorskie, the aim since 2005 has been to increase the level of investment in enterprises and to support the development of specific industrial clusters.

In Romania, a main policy challenge is the significant presence of foreign-owned companies (multinational corporations and Tier-1 companies) who may become important employers at regional level, but which are also considered to create an uncertain environment in terms of their presence in the region and job supply. Foreign companies that are not well anchored in the regional business environment may leave the region more easily

6 Eurofound's European Restructuring Monitor first set up in 2002 provides an up-to-date database of more than 20,000 large-scale restructuring cases.

and create economic problems as a consequence. In the light of openness to global markets, the West Romanian RIS3 strategy aims to respond to global pressures and support the development of the local SMEs' capabilities for R&I. The global forces in the manufacturing sector, such as the 'second unbundling' process of global production (Baldwin, 2012), have also been present in the region, whereby manufacturing tasks are located in different geographical areas as parts of large global manufacturing networks (World Bank, 2013). Globalisation's first bundling refers to falling trade costs and the second one to the effect of the ICT revolution that radically lowered transmission costs. For the automotive sector, the region's position in West Romania has attracted Tier-1 suppliers for regional production networks based in Germany (World Bank, 2013). The challenge of more developed regional economies, such as Pays de la Loire and Lombardy, is to maintain large industrial companies in the territories, creating conditions for them to become deeply rooted so that it becomes costly for them to leave.

Supporting industrial modernisation

Industrial modernisation is an explicit and implicit objective of regional economic development policies of each case study region. In this regard, a trend that can be observed across all case study regions is that national level policy, as well as regional industrial policy, is related to Industry 4.0,[7] an approach towards automation and data exchange in manufacturing technologies. In some regions such as Pays de la Loire, however, this phenomenon has often tended to further fragment the policy landscape rather than unify it, given the fact that promoting the uptake of advanced manufacturing under the Industry 4.0 paradigm is far from being an all-encompassing policy objective.

The large manufacturing regions of Baden-Württemberg, Lombardy and Pays de la Loire have Industry 4.0 high on the agenda, along with the digitalisation of their manufacturing base. Baden-Württemberg's Ministry of Finance and Economic Affairs identified a strong need to tackle the trends in advanced manufacturing. In this regard, the initiative Allianz Industrie 4.0 connects companies, chambers, associations, universities and research facilities with the purpose of providing a platform for a dialogue-based exchange on implementing technological solutions. In Lombardy, one of the specialisation areas of the RIS3 is specifically dedicated to advanced manufacturing. The Regional Law (26/2015), called Diffused Creative and Technological Manufacturing 4.0, underlines the prominence and value of craft and manufacturing activities as an essential asset of the regional economic system. The law encourages innovation among microenterprises and SMEs to reinforce regional competitiveness and attractiveness. In Pays de la Loire, the focus of its smart specialisation strategy is to accelerate changes in the industry, notably by reinforcing value-chains of the productive economy, and by promoting leading industries such as advanced manufacturing. The strategy relies on the creation of products of high technological density by developing cutting-edge manufacturing technologies with cross-sectoral and transversal applications that promote efficiency, quality, flexibility, and respect for the environment and population.

North Brabant and Pirkanmaa put more emphasis on servitising their economies and developing new business models (also through digital technologies). North Brabant specifically aims to make the region one of the five most innovative regions in Europe and the 'heart of smart solutions'. Servitisation is defined as 'the innovation of an organisation's capabilities and processes to better create mutual value through a shift from selling product to selling product-service solutions' (Baines et al, 2009). Pirkanmaa's manufacturing companies are among the forerunners in this process. User-driven innovation and demand-driven innovations are other terms that have been widespread in Pirkanmaa and Finland in general.

Box 4: Servitisation in the manufacturing sector and the job multiplier effect of manufacturing

Recent research emphasises the trend of 'servitisation' of the manufacturing sector, highlighting that services are increasingly becoming an integral part of manufacturing (Altomonte and Békés, 2016). Purely production-focused manufacturing companies are no longer the norm, with an increasing number of companies combining manufacturing and services with the growing importance of services becoming apparent in both high and low-tech industries (Nordås and Kim, 2013). This shift is at least partly due to increased competition from developing countries as well as changing customer demands, such as for product-related services. Despite this trend, however, turnover generated through such services remains relatively low, highlighting capacities to further capitalise on service provision by the manufacturing sector (Lay et al, 2010).

Besides this trend towards servitisation in manufacturing, the job multiplier effect of this sector is an important aspect for supporting industrial modernisation. According to the literature discussed in Nosbusch and Bernaden (2012), smart manufacturing, in particular, also creates jobs in industries and sectors that supply, support and service manufacturers. An estimated 52 million jobs in the EU depend directly or indirectly on industry, and a total of 20.4 million jobs depend on other sectors delivering to the manufacturing sector (IW Consult, 2013). Without the manufacturing sector some jobs in, for example, business services, logistics and utilities industries might not exist; in 2011 these industries delivered nearly one-fifth of their output to the manufacturing sector. According to the National Association of Manufacturers in the USA, the manufacturing multiplier is 1.58, meaning 100 jobs in manufacturing support a further 58 jobs in the supply chain (Nosbusch and Bernaden, 2012). However, the job multiplier effect can differ largely depending on the type of manufacturing, and while manufacturing creates jobs in other sectors related directly to its economic activity (for example suppliers), it may also impact other job opportunities in the regional context. Moreover, employees in the region who are directly linked to the manufacturing sector also demand more services such as healthcare, childcare and education (Goos et al, 2015).

7 Industry 4.0 is about the creation of the 'smart factory'. Within the modular structured smart factories, cyber-physical systems monitor physical processes, create a virtual copy of the physical world and make decentralised decisions.

In Pomorskie and West Romania, there is less discussion about advanced manufacturing as such and, as highlighted before, policymakers are more concerned with improving the basic value chain position of their industries. That said, industrial modernisation is a policy element. In Pomorskie, the regional strategy sets important targets for developing the innovation potential of the manufacturing industry and the RIS3 strategy; in particular, the strand related to 'Off-shore, port and logistics technologies' foresees the development of new technologies in this sector (while not directly discussing advanced manufacturing as such).

Link to education

Higher education and vocational training are areas which are, in general, not directly addressed under regional economic development policies, and decisions are taken at other levels or in other government departments, although regional economic development strategies reference their importance. The first and second RIPSs, organised in the framework of the Future of Manufacturing in Europe project, also highlighted the importance of skills, training and education policies for regional industrial development. This is shown by the fact that a regional endowment with higher or specifically demanded qualifications influences how attractive the region is perceived by industry.

Again, regions have different levels of maturity and governance mechanism in this regard. In Romania, the education and training policies are the remit of the national government and have not been particularly coordinated with industrial development or regional and local-level strategies. However, in Pirkanmaa, universities and vocational schools have traditionally played an important role in industrial development, and the needs of industries and the curricula are, to a great extent, coordinated.

In Sardinia, education is in the remit of the national level government, while vocational training is taken care of at the regional level. For this reason, vocational training is much more integrated with the regional industrial strategy than education.

In Pomorskie, the shortage of an appropriately skilled workforce to service growing industrial needs is a challenge, which education and vocational policies have to address. In order to increase the quality of regional human resources, the regional government took the initiative to launch skills improvement programmes instead of waiting for a national level reform. The regional government supported the development of curricula in vocational education that address the needs of regional companies (both manufacturing and other) for better skills in digital technologies, advanced manufacturing and languages. The curriculum was launched at subregional level and is considered to be a pro-active step in adjusting to regional needs.

In Lombardy, policymakers contacted as part of the case study were all aware of the importance of education and training in light of the existing industrial policy objectives. According to them, education and training policy is important for providing a human resource base with the right set of skills. This is specifically important for allowing the diversification of the regional economy. In spite of this, the region's main policy documents seldom refer to education and training as a key policy domain, and do not explicitly link industrial policy objectives to the region's education and training policies. There are signs, however, that the region is increasingly linking industrial policy to education and training policy. This is illustrated by the fact that the Regional Law (26/2015) included, for the first time, an explicit link to education and training. The role of vocational training in promoting the development of advanced manufacturing in the region is explicitly recognised by the law.

In Pirkanmaa, education policy is important in terms of providing the human resource base equipped with the right set of skills. This is specifically important for allowing the diversification of the economy. Primary and secondary education is in the power of the municipalities. The city of Tampere and municipalities pay special attention to foster skills development right from the start. At the time this study was conducted, schools in the region were preparing to adopt the new 2016 curriculum, which includes social studies such as ICT skills and financial management. Another important new aspect is cross-disciplinarity. There will be a stronger focus on developing a culture of cross-disciplinary and holistic learning. The objective of secondary education will be to furnish children with the broad-based skills they will require in the future (City of Tampere, 2016). Vocational education is another area through which the city is fostering skills development, which will be useful for industry.

Most recent shifts in the latest programming period

Several common shifts in the policy approach can be observed across the case study regions. Catalonia, Lombardy, Pays de la Loire and Sardinia shifted their policies towards a more vertical approach,[8] focusing on sectors or strategic markets (Figure 3). In Lombardy, while there is a certain path dependency in the selection of thematic specialisation, more emphasis has been put on markets such as green chemistry, smart communities and smart factories. In Pomorskie and West Romania, a sectoral dimension of the regional development strategies has also become more prominent (specifically through the smart specialisation strategies), even if the regional policy measures follow a vertical approach. In North Brabant, even if the new top sectors are at the core of the strategy, the policy is very much orientated towards the framework conditions around them.

8 Industrial policy is a broad term and can include various interventions that target economic restructuring (Di Maio, 2013). Such interventions can relate to 'horizontal' policies aiming at the right regulatory framework and business climate or 'vertical' industrial policies, where the focus is on selecting and supporting specific industrial sectors.

Figure 3: Vertical and horizontal focus in regional policy

Source: *Technopolis Group.*

Another trend that can be observed in policy objectives is the focus on a reduced number of priority sectors and technology fields, such as those in Catalonia, Lombardy, Pays de la Loire, Sardinia and West Romania. This might also be a result of the European efforts in smart specialisation, promoting the identification of the key regional strengths and concentrating funding on priority areas.

Besides the focus on industrial sectors or clusters, a shift in industrial policy is the efforts put into new **industrial niches**. In Pomorskie, the policy focus has been kept, but at the same time more emphasis is put on technological niches. Also, in North Brabant and Pirkanmaa, the scaling up of innovative niche activities is getting policy attention. However, at the time of conducting this study, no evidence on the effectiveness of such strategies aiming at fostering specialisation within industries is available.

Cross-sectoral cooperation, which fosters development at the intersection of different sectors and industrial areas, has become important in Catalonia, North Brabant, Pays de la Loire, Pirkanmaa and Pomorskie. In Pirkanmaa, an important shift has been made from traditional cluster-based policy towards open innovation/platform-based innovation where open innovation and cross-sectoral collaboration are placed in the centre. The government is taking a stronger role in establishing innovation and demonstration platforms where new ideas can be tested. It creates environments where people find it easy to try out new products and services. Cluster initiatives have not disappeared, but the platform-based approach is a new complementing element that links the clusters.

Internationalisation is receiving increased attention in Catalonia, Lombardy, North Brabant, Pirkanmaa, Pomorskie and Sardinia. In Sardinia, low exports are one of the main weaknesses of the economy. For this reason, the Department of Industry has been entrusted by the regional government to implement specific policies to increase the exports of regional companies. In Pomorskie, the most recent policy has shifted more towards fostering internationalisation of innovative regional undertakings. Regional development and economic policy is closely coordinated with investment promotion and trade policies. During the previous programming period (2007–2013), the region turned very much towards China, fostering emerging economic opportunities. However, as of 2017, the horizon of the investment policy has become broader and includes more international markets.

Financial instruments as specific policy tools to foster companies' access to finance got considerable attention in Lombardy, Pomorskie and Sardinia. Pomorskie is developing a long-term plan that takes into account the possible reduction of financial allocations in the post-2020 EU funds programming period. The region plans to set up a Pomeranian Development Fund to try to develop a new pathway for regional development. In Sardinia, financial instruments have become increasingly important, both as an answer to the reduction of available public resources and to further empower the recipients.

These common trends reflect the reactions to continuing global and macro challenges, such as economic pressures from globalisation, internal market shortages, demographic shifts, and fast technological changes that are both threats and offer opportunities for new sources of growth (such as better exploitation of new technological solutions through cross-sectoral cooperation).

3 Policy governance

Competence and autonomy

Level of autonomy and collaboration with the state

The industrial policy governance of regions is generally determined by the national institutional framework and tends to be influenced by national regulations that set the business environment framework and tax regimes. However, in countries such as Germany, Italy and Spain where regions enjoy a high level of autonomy, the regional level plays a stronger role in industrial development. In other cases such as Finland and Romania, the regional level has limited powers in the sense of a traditional industrial policy. Instead, their interventions tend to focus more on fields such as regional development, support for SMEs and support for clusters. In Finland and France, there is a continuing reform process that devolves greater responsibilities to regional authorities to design and implement regional economic development and industrial policies.

The European Spatial Planning Observation Network, an applied research programme aimed at supporting the formulation of territorial development policies in Europe, makes a distinction between four levels of regional autonomy. According to this typology, the nine case study regions analysed belong to the following groups.

- **Very high level of autonomy:** Regions in federal states with very high levels of autonomy (Baden-Württemberg).
- **High level of autonomy:** Regions with elected regional governments with constitutional status, legislative powers and high degree of autonomy (Catalonia, Lombardy and Sardinia).
- **Medium level of autonomy:** Regions in decentralised unitary states that have established elected regional authorities with a medium-to-low level of political autonomy (North Brabant, Pays de la Loire and Pomorskie).
- **Low level of autonomy:** Centralised unitary states where regions exist for administrative reasons but are subordinate to the central state with no political autonomy (Pirkanmaa and West Romania).

In Baden-Württemberg, Catalonia, Lombardy and Sardinia, the key industrial policy players are found at regional level. However, even in regions that enjoy high levels of autonomy, the national level is involved in regional industrial development to some extent.[9] In Lombardy and Sardinia, direct enterprise support programmes, innovation funds, loans and venture capital funds are channelled to local companies through regional level policy measures. In addition, a reform dating from 2001 granted regional councils all the administrative functions that are not otherwise reserved for higher levels of government. However, on cluster development and cluster support policies, the regional and national governments collaborate closely in order to define key clusters and to ensure efficient administration of national funding.

Box 5: Defining regional industrial policy capacity and capacity building

Denis and Lehoux (2014) define policy capacity as the 'capacity of government and other public actors to plan, develop, implement and evaluate purposeful solutions to collective problems'. In the framework of regional industrial policy, this refers to the ability of governments to react to changing economic environments and opportunities that influence industrial performance.

The current study is based on the understanding that regional industrial policy capacity is influenced by four major elements.

- **Degree of autonomy:** The region's ability to influence the setting of policy priorities and their implementation.
- **Availability of resources:** The financial and human resources needed to design and implement policy strategies.
- **Skills and competences:** The availability of expertise, knowledge and policy intelligence tools that help the identification, design and implementation of the adequate policies and instruments, as well as the existence and effective use of monitoring and evaluation for adaptation and further improvement of the policies and instruments, if required.
- **Strength of coordination and cooperation within regional policy stakeholders:** Also with other regions and administrative levels in the country or cross-nationally.

Following from that, 'capacity building' is understood as any action strengthening and further developing human resources (including skills development), organisational arrangements (including cooperation and coordination mechanisms, risk management, multiannual planning and decision support systems), as well as framework developments (for example, institutional or legal) enabling stakeholders to enhance their capacities (EQUAL, 2006; UNCED, 1992; Pucher et al, 2015a and 2015b).

9 In Italy, regional and national governments collaborate closely on cluster policy to define key clusters and ensure the efficient administration of national funding. The same happens in Germany, where at the national (federal) level, support is provided by the Federal Ministry of Economics and Technology with its programme Go-cluster: Exzellent vernetzt! The Federal Ministry of Education and Research also gives support by organising the leading-edge cluster competition under the federal government's High-Tech Strategy, which aims to promote the development of efficient cluster structures.

In North Brabant, Pays de la Loire, Pomorskie and Pirkanmaa, the industrial policy governance can be understood, only when taking into account the multilevel setting and the interplay and intricate relations among the local (city and municipalities), regional and national levels of government. For instance, in France, governance is often described as a 'mille-feuille' (the French pastry made of 'a thousand layers') because it includes a minimum of four layers of government: national, regional, departmental and local, and city/ municipality levels. For instance, county councils are represented in the regional development council and have the responsibility of approving all strategies and activities of the RDA. They are therefore key stakeholders in defining regional priorities. In addition, the national level industrial policy and, specifically, the launching of the competitiveness cluster policy, play a decisive role in regional industrial development. The central government, represented at regional level by the Regional Directorate for Enterprises, Competition, Consumers, Labour and Employment (working under the umbrella of two ministries: that of economy and finances; and work, employment, lifelong learning and social dialogue) supervises and co-finances the regional competitiveness clusters jointly with the regional council and local authorities.

The case of West Romania is unique, given that the regional administrative structure was created in the early 2000s to manage the implementation of the European structural funds operational programme. Officially, the regional level has no legal status in Romania, and hence no real policymaking responsibilities. It also has funds to disburse through regional programmes. NUTS2[10] regions are territories that have been introduced for statistical purposes as territorial units in Romania, and have no administrative autonomy. In West Romania, neither the regional nor local level play a decisive role in industrial policy, but rather act as implementation bodies of national policies. The local and county levels have not developed economic policymaking capacities and strategic guidelines, although they do support industrial investors and the regional level has a well-developed cluster policy. This limits policymakers' ability in seeking to develop real influence over the local industrial policy agenda.

Box 6: A shift towards decentralisation in public administration

Recent years have seen a slight shift to decentralisation in public administration, in essence giving more power to regional actors (Bristow, 2005; OECD, 2007, 2010; Charbit, 2011). This is justified by the opinion that regional actors are well placed to identify local needs, a recognised importance of taking advantage of regional networks among stakeholders to reach joint regional industrial policy goals and the related benefits of regional social capital (Allain-Dupré, 2011).

While institutional structures may differ, there are some common patterns on decentralisation. For example, it can be channelled through an increased focus on smart specialisation which stresses the importance of a bottom-up approach, where the private sector is in charge of discovering and producing new activities while the government then assesses the outcomes and empowers those actors with the highest potential (Perianez-Forte and Cervantes, 2013). The smart specialisation strategy is then characterised by a close link between the different levels of government and private companies.

A trend towards decentralisation, however, does not necessarily mean that the powers of central government are being diminished but, rather, that they are being redefined with central governments having the role of creating a broader framework for regional development policies, in addition to monitoring the progress of regions and facilitating any coordination and cooperation efforts (OECD, 2010). For example, central levels of governance may be best suited to carry out larger projects that affect several regions as it is generally easier for a larger coordinating body to implement large-scale projects (Storper, 2013).

Both excessive centralisation and excessive decentralisation have risks attached to them suggesting that some sort of combination of the two extremes will likely produce the best results. The former bears the risk of asymmetries of information, investment not (sufficiently) targeted at local needs, a vertical approach to investment, insufficient complementarities across sectors, as well as passive local governments that do not complement national policies by their own efforts (Allain-Dupré, 2011). The latter involves a potential lack of consistency among national and subnational strategies, insufficient vertical coordination across levels of government, and pro-cyclical policy at subnational levels during crisis time which may hinder national strategies, a lack of horizontal coordination across jurisdictions and, finally, a risk of duplication in investment decision/waste (Allain-Dupré, 2011).

The amount of control over funding allocation that is given to the regional level is also indicative of the real power that has been transferred from the national or European level to the regional or local level (OECD, 2010). Having a heavily centralised government that still controls funding can substantially constrain a region's ability to allocate resources. However, in some contexts, this sort of central oversight can be a more efficient way of coordinating several development programmes that, without coordination, could potentially overlap. Co-funding mechanisms have the benefit of ensuring regions do not reduce their own level of spending due to funds coming from national or supranational level (Allain-Dupré, 2011). However, such arrangements can result in a disadvantage to financially weaker regions. Therefore, in some OECD countries, mechanisms have been put in place to ensure that these regions also have access to necessary funding. For example, in Germany, some federal states such as Nord Rhine-Westphalia have set up special funds to assist municipalities in financing their matching funding contribution (Allain-Dupré, 2011).

10 http://ec.europa.eu/eurostat/web/nuts

Bottom-up versus top-down approaches in policy design: a shift in the role of regional authorities

The two extremes of industrial policymaking are represented by a very bottom-up and self-regulated approach, and a fairly top-down and centralised approach. However, it is worth mentioning that bottom-up approaches are not exclusive to regions enjoying a high level of autonomy, as illustrated by the case of North Brabant and Pirkanmaa.

Baden-Württemberg has adopted a clear bottom-up approach in defining industrial development priorities, which clearly follows the voice of the business community. The policy is the result of relatively loosely coordinated activities and accompanying measures that rely on a strong network-based paradigm of governance with the involvement of many clusters, networks and regional agencies. These regional and local networks are not steered by a top-down policy, but are operated independently by the local actors themselves, particularly by the business associations and the chambers of commerce.

In North Brabant and Pirkanmaa, a bottom-up approach in policymaking can be observed, even if both of their host countries (the Netherlands and Finland respectively) are fairly centralised, where national level priorities are decisive. National authorities provide only the framework and local actors, such as the city and municipal governments, actively shape their development priorities and future investments. The Netherlands is a centralised country, nevertheless the governance structure of industrial policy is decentralised towards the provinces, municipalities and cities. For instance, at local level, high-tech campuses and research institutes play an active role in shaping decisions regarding the use of funding instruments. Similarly, in Pirkanmaa, the regional level plays a less important role compared with the national or city level, and it is generally seen as a coordination platform. The most important stakeholders determining regional industrial policy directions at the regional level are the city of Tampere and the regional representatives of the central government.

In Catalonia, Pays de la Loire, Lombardy, Pomorskie and West Romania, a more top-down approach in policy governance can be observed. In Poland, despite a certain degree of autonomy at the regional level, the central government plays an important role in regional economic development policy, and regional policymaking traditionally follows a top-down approach. In Lombardy and Catalonia, the regional governments play a predominant role in the design of industrial policy, and are the main source of funding for implementing this policy. Yet, even in these regions, there appears to be a shift towards the adoption of more bottom-up processes for the design of economic development and industrial policies, which stems from a mix of the following factors.

The EU's Principle of Subsidiarity and Proportionality: This guarantees 'a degree of independence for a lower authority in relation to a higher body or for a local authority in relation to central government' (European Parliament, 2017). It recognises the local expertise of the regional level, which is necessary to identify relevant interventions and possible synergies, while the national level can provide resources and act as a coordinator between regions with complementary competencies (Bianchi and Labory, 2011).

The European Commission and smart specialisation strategies: These have been key determinants, through the concept of 'entrepreneurial discovery' for opening up the policymaking process to the private sector (enterprises, start-ups, business associations, and chambers of commerce). This has resulted in the increased attention of regional policymakers to enter into a policy dialogue with a broad range of regional stakeholders. For instance, the agenda-setting process of the smart specialisation strategy in Pomorskie has been unique in comparison with the previous strategies, given that it was an open competition for the identification of target areas and priority technology domains. Pomorskie successfully applied a negotiation approach based on the participation and involvement of various partner institutions, entities and communities. Overall, some 400 entities have been involved in the process.

The importance given to the development of regional business and innovation clusters: This has been a core component of the regional and national industrial policies in Catalonia, Pays de la Loire and Pomorskie, and has also been important for developing bottom-up approaches to the design of economic development and industrial policies. Clusters – which can be defined as organisations grouping enterprises, research and higher education organisations, as well as policymakers in light of fostering joint collaborations – are by essence emerging from bottom-up approaches.

A long devolution process: In countries such as France, this process, starting in the 1980s, then consolidated in 2004 and more recently in 2014, gives greater responsibilities to regional authorities and other local forms of government (metropolitan areas for example) to shape their regional and local economic development policies and to contribute to the design of their industrial policy. This has often forced them to consult socioeconomic partners and stakeholders when designing their plans and policies.

This observed shift in the case study regions has resulted in the general perception of a changing role of regional authorities in the design and implementation process of industrial policy, perceived not only as a programmer or funder, but also as a facilitator and inspirer. In Baden-Württemberg, Lombardy and Pirkanmaa, it was specifically highlighted that the role of the regional level is considered as an important facilitator of institutional cooperation between and across public and private sector organisations. Similarly, in Catalonia, the main role of the regional government is to provide the framework for the creation of companies and business development and innovation. In North Brabant, the main role of the regional government is to serve as an inspirer and stimulator, and to co-fund strategic initiatives developed by stakeholders in the region. Given the lack of autonomy in developing its own regional level

industrial policies, West RDA considers itself as a creator of participatory processes in mobilising the private sector to drive regional development and seeks to consolidate this role. In Lombardy and Sardinia, the Regional Administration Authority (RAA) is the most important regional policymaker. Its role and responsibility is to guide, plan and coordinate the management of the regional territory, by aligning the different interests and influences among the regional actors.

One of the consequences of this shift is a greater consensus, acceptance and understanding among regional policy stakeholders around the strategic orientations and policy goals of regional industrial and innovation policy. This tends to be confirmed by the fact that, in general terms, stakeholders interviewed as part of this study have not raised significant questions around the relevance and consistency of regional industrial policy orientations, and tend to consider their most recent economic and industrial development strategies to have clearly formulated objectives. This shift in the role and position of regional levels of governance has also tended to strengthen the sustainability of the policy in the long-term. In Pays de la Loire, the change in the regional government in 2014 (regional elections) did not affect the policy orientation towards advanced manufacturing. The incoming administration confirmed major commitments and investments in technological and innovation platforms to support its development, which had been adopted prior to its arrival.

Increasing involvement of the business organisations, trade unions and innovation stakeholders in policy design

The progress towards the adoption of multistakeholder approaches to policymaking has been a driving force for a higher level of involvement of the private sector in the agenda-setting process. For some of the regions, the involvement of the private sector represents a long-standing tradition (particularly in Baden-Württemberg and Lombardy) while, for others (Pomorskie and West Romania), this more recent trend has been driven by the European Commission's approach to EDP as part of the S3 strategy development process (2013 and 2014). According to the European Commission's Smart Specialisation Platform, EDP is defined as 'an inclusive and interactive bottom-up process in which participants from different environments (policy, business and academia) are discovering and producing information about potential new activities, and identifying potential opportunities that emerge through this interaction, while policymakers assess outcomes and ways to facilitate the realisation of this potential'. In addition, EDP 'pursues the integration of entrepreneurial knowledge fragmented and distributed over many sites and organisations, companies, universities, clients and users, specialised suppliers (some of these entities being located outside of the region) through the building of connections and partnerships'.

Chambers of commerce

Based on the case study analysis, private sector interests and voices are expressed in the agenda-setting process through several organisations and intermediary structures. The most frequently identified group representing the voice of industry in all case study regions are the chambers of commerce and industry, which support business development in the specific territories. In all case studies, these chambers act as representatives of the private sector, offer technical assistance services to companies (managing the trade register, supporting entrepreneurs, training programmes for enterprise managers), and take part in the decision-making process.

Chambers of commerce and industry are highly active in Baden-Württemberg, Pirkanmaa and Pomorskie. In these regions, they are consulted before important decisions are taken on issues such as regulations or policies, given that this is one of the functions placed upon them by the existing legal framework. However, the intensity of involvement of chambers in the decision-making process seems to depend on (in terms of expected impact) the length of the legislative process (up to two years) – the longer it is, the higher the level of involvement of the chambers. Also, by launching their own or commissioned studies, reports and position papers in the framework of their work as interest groups, chambers frequently provide input in the form of knowledge, information and analysis for the policymaking process. In addition, the chambers in Baden-Württemberg can give comprehensive insights to enterprises as they are responsible for vocational training.

In the other regions, the role of chambers of commerce and industry in the decision-making process is less central. However, they tend to actively participate in this process through their participation in consultative committees. For instance, the chamber in Pays de la Loire holds a seat in the Regional Conference on economy and sustainable employment, which has the overall mission of ensuring consistency across all regional economic development policies, sharing a vision for the development of the regional support schemes, monitoring the major projects in the region, and providing advice to regional policymakers.

Industry associations

Industry associations are also involved in the regional industrial agenda-setting process. These are, for example, very active in Catalonia, Lombardy and Pays de la Loire where the Catalan SME employer organisation (PIMEC), entrepreneurial federation Confindustria Lombardia and the Pays de la Loire's Metallurgy Industries Association (L'Union des Industries et Métiers de la Métallurgie (UIMM)) are key to representing regional SMEs and large industries in government-led consultations. They have historically played an important role by influencing the policy agenda, the design of the regional industrial policy and the framework conditions in the region, and by advocating the interests of their members. They organise training sessions for their members and convey their policy views in the region, being very active in local and social media and in the organisation of meetings between their constituents and policymakers. In Pays de la Loire and Lombardy, such

industry associations are an integral part of the agenda-setting process and in designing policy measures and regional schemes. In Pays de la Loire, the UIMM is at the core of the design of the regional policy for the uptake of advanced manufacturing technologies by SMEs.

Cluster organisations

Cluster organisations represent a third tier of business representation at the regional level, which is often involved in the agenda-setting process. Given that cluster organisations tend to benefit from regional industrial policies, this puts them in a unique position when contributing to the definition of a regional policy agenda. In many instances, cluster organisations contribute valuable technical and commercial intelligence to priority sectors, technologies and markets supported by regional industrial policies. Cluster organisations have been found to be particularly active in Lombardy, Pays de la Loire and Pirkanmaa. In Pirkanmaa, several industrial platforms have been established as a result of national and regional policy programmes, such as the Finnish Metals and Engineering Competence Cluster (funded by the Strategic Centres for Science), the Technology and Innovation initiative of the Finnish government, and BioMediTech (supported by the regional council). They are usually R&I orientated, with the key players behind these platforms being the regional universities.

Individual SMEs

More recently, in the framework of the preparation of the S3 strategy, individual SMEs and large companies have become directly involved in the decision-making process on regional industrial policy. In Pomorskie, 300 companies participated in the open competition for the identification of target areas.

Trade unions

In a handful of case study regions, such as Baden-Württemberg and Lombardy, trade unions are, to some extent, also involved in the industrial policymaking process. This is not only the result of a long tradition of social dialogue in the regions, but also of a greater awareness of the impact of new manufacturing technologies on required skills and training. In Lombardy, in the framework of producing the S3 strategy, trade union organisations such as the Italian General Confederation of Labour (CGIL), the Italian Confederation of Workers' Trade Unions (CISL) and the Italian Labour Union (UIL) took part in regular meetings with the chamber of commerce and industry association to align their vision of the main sectors of specialisation, and the initiatives implemented by the European Social Fund (ESF), ERDF and the European Agricultural Rural Development Fund (EARDF).

In Baden-Württemberg, the regional branch of IG Metall (which covers around 431,000 employees of the metal/electronics, steel, textile/clothing, wood/plastic and information and communication technology sectors) is consulted before taking decisions. Trade union organisations take part in dialogue on ICT policies, automotive, mechanical engineering, aerospace and technology transfer. Due to the importance of the mechanical engineering sector for Baden-Württemberg, there have always been very strong links between the Mechanical Engineering Industry Association (VDMA) and the Ministry of Economics. However, expected developments and challenges for the future have also required the increased involvement of employee associations. To conduct this dialogue, an event takes place every two years and brings together up to 200 participants. These include representatives of VDMA, IG Metall and of research institutions. The involvement of trade unions in the industrial agenda-setting process can be considered as good practice in the sense that it helps to take on board skills and training issues, and the challenges of the industrial agenda.

Universities and research institutions

As with trade union organisations, the role of universities and research institutions in the shaping of the industrial policy agenda appears limited to just a few cases (Lombardy, North Brabant and Pirkanmaa). In Pirkanmaa, the Tampere University of Technology and the University of Tampere, have traditionally been well connected to industry with the engineering industry relying on technical universities to innovate and strengthen its competitiveness through technology transfer programmes. These universities are involved in the advisory board which steers the regional development strategy adopted in 2014, participate in several regional initiatives and support schemes, and provide intelligence and studies on the regional industrial sector. Universities are considered as key actors in the industrial policymaking process and they also play a role in policy implementation given their activities in direct business support through services such as the development of skills in companies. The University of Eindhoven in North Brabant is also very well integrated into the regional business community, providing both contracted research and an opportunity to seek out government funding through public–private partnerships. The rector of the university is also a board member in the key regional and national policy steering groups. In Catalonia, it is the Catalan University Rectors' Conference that participates actively in industrial policymaking.

In several case studies, it was pointed out that individuals such as former rectors or vice-rectors are able to influence the policymaking process by expressing their opinions through, for example, press articles and interviews. In Lombardy, certain university teachers and researchers, notably in life sciences, are very influential in the allocation of public funding in support of science and technology projects and in the development of research infrastructures.

Match and mismatch between strategic design and policy funding

A key influence on policy governance, which can sometimes predict to what extent the policy strategy is translated into concrete public support measures, is the link between strategic design and policy funding. Ideally, the two should lie in the hands of the same institutions or regional/local body; or at least be in the hands of institutions that strongly communicate with

each other and have agreed objectives. The regional case studies illustrate that while in some regions policymaking responsibilities are accompanied by high budgetary autonomy, in others policymaking responsibilities are somewhat limited by the lack of self-collected and managed funds and financial resources. In cases where there is a mismatch between policymaking and funding and spending autonomy, regions tend to be much more limited in their capacity to influence the development of industrial development.

In Baden-Württemberg, Catalonia, Lombardy and Sardinia, regional governments benefit from high levels of fiscal autonomy, which they use to implement and collect regional taxes. However, they also receive funding from the national government through national programmes. They therefore have extraordinary budgetary powers to foster economic and industrial development. North Brabant also has access to self-managed funds and has significant means to support its own development priorities. In Pirkanmaa, the cities collect their own taxes which they use for industrial development.

In Pays de la Loire, the regional council has a limited budget and limited fiscal autonomy. An important share of the regional budgets in France (approximately 35%) comes from annual block grants from the central government, approved by the French parliament. European Structural Funds, which have been managed since 2014 by regional councils are, however, an important source of funding for regional investments in industrial policy.

Pomorskie and West Romania do not have the prerogatives and tools to fund the strategies they co-produce with the central government. In Pomorskie, the Regional Assembly (responsible for deciding on strategic orientations) has minor tax raising powers and it depends on the central government for financing its operations, as part of the regional budget is in a fixed agreement with the central government. In addition, the central government decides, supervises and coordinates the allocation of ERDF funding across the regions. At the centre of regional agenda-setting processes in West Romania are the county councils who endorse the regional strategy (set by the RDA) and the prioritisation of projects to be submitted for funding, especially from the ERDF/ESF Regional Operational Programme. However, at the same time, the National Ministry of Regional Development and Public Administration defines the main criteria for the projects that need to be funded which, in the end, often differ from and prevail over regionally defined priorities. As a result, and even if West Romania's regional development council agrees with the regional strategy's priorities and lists a number of key projects to be developed by the counties, in practice, these steps tend not to be taken into account in the actual funding of projects. In the end, the local county councils and city governments submit projects to be funded, based on considerations that often ignore the regional strategy, and the final funding decision is taken by the managing authority based on nationally defined criteria. This has been a constant source of conflict between the national and regional or local levels, and is unlikely to be resolved until a more decentralised manner of governance is designed for Romania – which so far has been politically unfeasible.

Strong influence of European level stakeholders on agenda setting

In addition to the national level of government (and governance), stakeholders at European level also have a strong influence on the decision-making process – albeit with different intensities – which takes place within the case study regions. Based on the findings drawn from the case studies under review, there appear to be two levels or 'channels' of influence at European level which factor into regional level industrial policymaking:

Firstly, the European Commission influences regional policymakers by pushing forward new priorities and orientations. In advanced manufacturing, for instance, regional stakeholders have drawn extensively from EU-sponsored initiatives and documents such as the Vanguard Initiative for New Growth through Smart Specialisation, key enabling technologies (KETs) (European Commission, undated c) and the *Report of the task force on advanced manufacturing for clean production* (European Commission, 2014b) to develop their own strategic guidelines and identify priority interventions. As another example, through the Cohesion Policy, the European Commission has influenced the regional policy agenda on economic development by setting a stronger focus and priority on innovation capacity enhancement and industrial competitiveness at regional level.

Secondly, the European Commission has influenced the methods for designing industrial and innovation policies and how these are implemented. Through the S3 process and the concept of entrepreneurial discovery, the Commission has encouraged the use of a more bottom-up approach in the design of regional strategies, particularly through a more active participation of local SMEs, and a stronger focus of public intervention on a limited number of sectors of specialisation. It has also contributed to, together with strong pressure on the public budget, an increased interest and awareness among the policymaker community on the importance of financial instruments (instead of grants, for example) to support industrial development and the take-up of innovation by the industrial sector (see Chapter 4).

It is worth noting, however, that the influence of EU-level stakeholders – and particularly that of the European Commission – tends to be much higher in regions where European structural and investment funds (ESIF) constitute the main source of funding for economic development such as in Pomorskie, Sardinia and West Romania. In spite of this, it is clear that in regions such as North Brabant, Pays de la Loire and Pirkanmaa where ESIF plays a more limited role, regional and local authorities have still participated actively in the Smart Specialisation Platform set up by the European Commission and have been influenced by European level policy thinking.

Furthermore, the influence among European and regional levels appears to be reciprocal in some cases. In Baden-Württemberg and Pirkanmaa, policy thinking is conveyed to EU-level policymakers who take up some of their key priorities such as the theme of Industry 4.0 or service innovation, and disseminate this back to regions in other parts of the EU. The Vanguard Initiative for New

Growth through Smart Specialisation and the Interreg programmes are examples of main channels through which the concepts and priorities – having originated at the regional level – are disseminated at European level.

Multistakeholder approach in the regional policy process

The following table (Table 5) summarises the key features of industrial policy governance across the case study regions. It gives an overview of the types of actors that participate in the regional policymaking process and indicates their level of involvement.

- European level has more influence and plays a funding role in regions where structural funds are relevant.
- The involvement of the national government and the autonomy of the regional government reflect the institutional set-up of the respective country.
- Local governments are involved usually through consultations and participate more in the policy implementation phase.
- Business organisations and cluster organisations are key players only in Baden-Württemberg, but are consulted in all case study regions during the industrial policy design process.
- Companies are involved directly or via umbrella organisations.
- Universities and non-governmental organisations (NGOs) are also often among organisations to be consulted before decision-making.
- The role of trade unions was very limited in the analysed cases.

Table 5: Overview of main features of industrial policy governance in case study regions

	Baden-Württemberg	Catalonia	Lombardy	North Brabant	Pays de la Loire	Pirkanmaa	Pomorskie	Sardinia	West Romania
EU	Limited role	Funding	Funding and strong influence from European initiatives	Limited role	Funding	Limited role	Funding and strong influence from European initiatives	Funding and strong influence from European initiatives	Funding and strong influence from European initiatives
National government	Limited to high level and formal coordination	N/A	Fundamental principles set by national law; funding; limited role in practice	Design, coordination, funding	Design, funding	National guidelines	Coordination and implementation of higher level policies	Fundamental principles set by national law and funding	Design, funding
Regional government	Final decision maker and facilitator of the institutional cooperation and a collector of inputs	Design and implementation (autonomy), analysis of development, establishment of dialogue	Design and implementation (autonomy), evaluation	Implementation	Implementation (defining regional policy orientation based on national plans, managing EU funds, coordination)	Autonomy in implementation	Design and implementation (autonomy), monitoring, funding, coordination	Design and implementation (autonomy), evaluation	Consulted in the design process, Implementation (defining regional policy orientation based on national plans)
Local governments	Informal coordination	N/A	Take part in the consultation process for the design of the policy; implementation	Collaboration on an ad hoc basis at the implementation level	Take part in the consultation process for the design of the policy; implementation	Some leadership in design and implementation (financial autonomy)	Take part in the consultation process for the design of the policy; implementation	N/A	Implementation
Regional development agencies	Implementation delegated to them by regional government; consulted in the design process	Implementation delegated to them by the regional government	Implementation delegated to them by regional government; consulted in the design process	Implementation delegated to them by regional government	Implementation delegated to them by regional government	Implementation delegated to them by the regional government	Implementation partly delegated to them by regional government	Coordination, monitoring, implementation	Implementation
Business organisations, industry organisations, clusters	Key players and drivers in the design and implementation of industrial policy	Consulted (strong social dialogue, systematic structures)	Implementation; consulted in the design process	Consulted in the design process; implementation	Consulted in the design process; implementation	Consulted in the design process	Consulted in the design process	Consulted in the design process; lobbying; implementation	Consulted in the design process; implementation
Trade unions	Consulted in the design process; lobbying	Consulted (strong social dialogue, systematic structures)	Implementation; consulted in the design process, but limited participation in practice	No formal consultation	Formally consulted in the design process but limited participation in practice	No formal consultation	Consulted in the design process	Consulted in the design process; lobbying	No formal consultation
Companies	Involved often via umbrella structures	Consulted	Consulted	Consulted in the design process	Involved often via umbrella structures	Involved	Consulted in the design process	Consulted in the design process	Involved often via umbrella structures
Universities, R&D organisations	Implementation; consulted in the design process	Implementation; consulted in the design process	Implementation; consulted in the design process	Implementation	Implementation; consulted in the design process	Implementation; consulted in the design process	Implementation; consulted in the design process	N/A	Implementation
NGOs	N/A	N/A	Consulted in the design process; implementation;	Involved at sector level in implementation	No formal role	Not consulted; take part in the implementation (Demola)	Consulted in the design process	N/A	Formally consulted (S3)

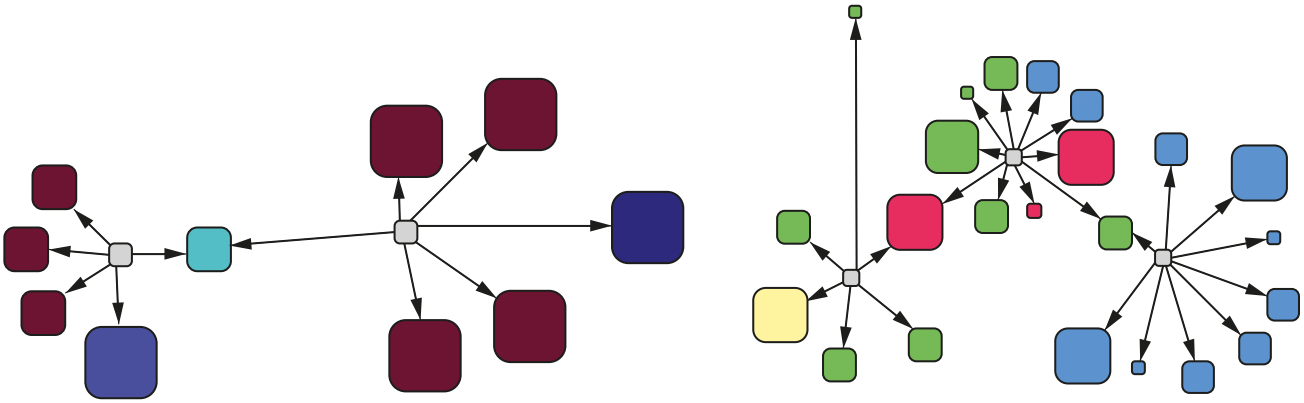
Source: *Technopolis Group.*

Table 5 not only shows the variety of different types of actors involved in the regional policy process, but also hints towards the related necessity of networking and cooperation. While the more specific mechanisms of multistakeholder involvement, and the coordination of policy design and policy implementation are discussed in Chapter 3, the diversity of the set-up of the regional policy networks can be illustrated by the responses to the small survey conducted among the participants of Eurofound's first RIPS.

As can be seen in Figure 4, for the two respondents from Malopolska (Poland) it is interesting to note that they are from the same institution but do not indicate each other as being among the most important contacts in the framework of regional policymaking. Rather, they are indirectly linked through a person from another institution who, hence, has a bridging role in the policy process. This person is of medium importance to both of them and contact frequency differs between the two respondents. Also interesting is that one of the respondents seems to have a rather tight network (high frequency of contacts with all indicated individuals), but considers them only of medium importance, while the other respondent has a high contact frequency with only one individual, but reports more contacts as being of higher importance.

Also, the three respondents from the Basque region (Spain) show rather diverse networking behaviours. While one of them reports high contact frequency with all identified individuals, the second one has medium contact frequency with all partners, and for the third respondent contact frequency differs among the cooperation partners. Similarly, the importance contributed to the relationship for an effective policy process varies among the three respondents. The first and second respondents attribute a variety of relevance levels to the identified contacts, while this is more homogeneous for the third respondent. The first respondent shares one contact with one of the other respondents, resulting in a 'central position' of this respondent in the illustrated policy network. These shared contacts are deemed of rather high importance by all respondents but are contacted more often by the other two respondents than by the respondent who is in the centre of the network. Overall, it seems that the Spanish respondents are in contact with a more heterogeneous set of institutional actors than the Polish ones.

Figure 4: Illustrative regional policy networks



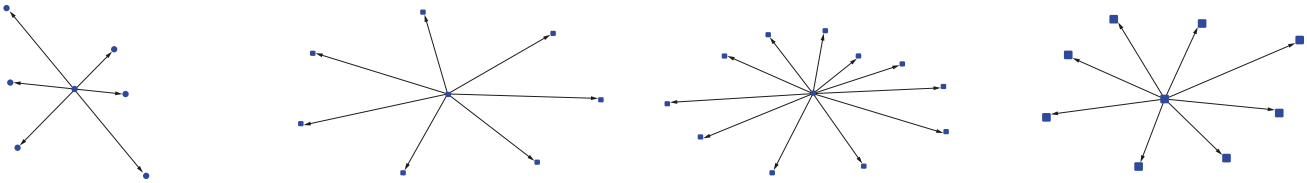
Two respondents from the Malopolska region (PL)

Three respondents from the Basque region (ES)

Note: *The grey bubbles represent the respondents. The other bubbles are the individuals they identified as the most important contacts in the regional industrial policy process, with the different colours refering to different types of organisations these individuals are affiliated to. The size of the bubbles indicates the assessed importance of the contact for the policy process (the bigger, the more important) and the length of lines between the bubbles indicates the frequency of contacts (the shorter, the more often).*
Source: *Eurofound survey among the participants of Eurofound's first RIPS.*

However, it should not be considered that within a region there exists a single established collaboration model related to the industrial policy process. Rather, networking activities differ across institutions and even individuals within the institutions, and also on the phase and orientation of the policy process. The example of the respondent from north-east Romania in Figure 5 shows that for the analysed strategic aspects, the highest number of relevant contacts relates to the funding of policy instruments (11), while a medium number of key contacts are active in the phase of policy design (6) and policy implementation (7). A number of important relationships (8) are identified for developing or maintaining competence and capacities as well as for defining and discussing processes and platforms for regional policy design and implementation.

Figure 5: Networks related to strategic aspects of the policy process, respondent from north-east Romania

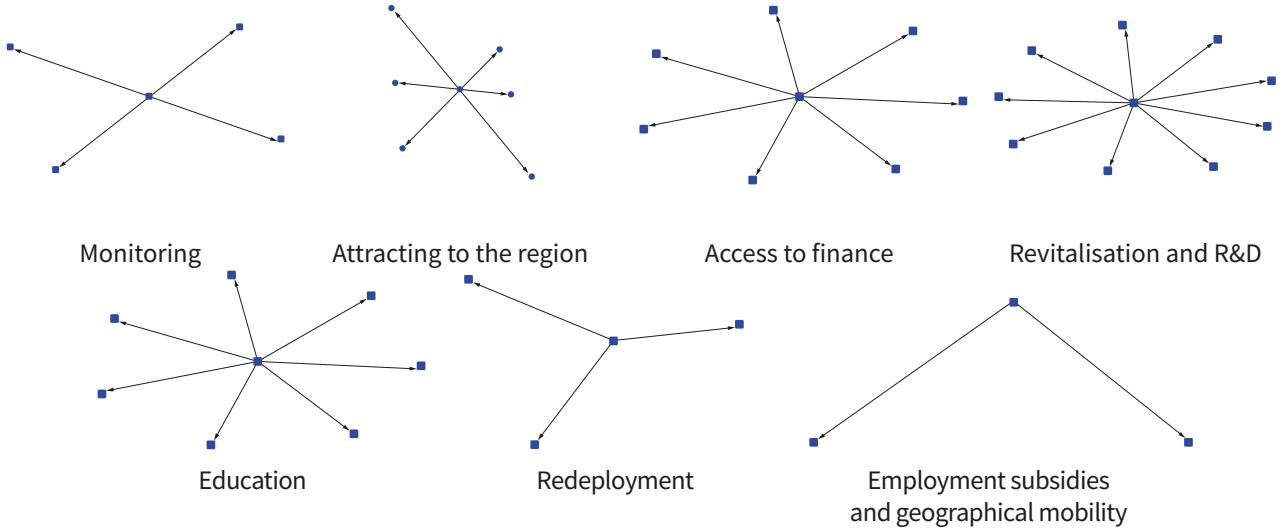


Policy design | Policy implementation | Funding | Developing capacities and processes

Source: *Eurofound survey among the participants of Eurofound's first RIPS.*

As for the different topics covered by the regional policy, it can be seen in Figure 6 that the respondent from north-east Romania reports the fewest number of important relationships for employment subsidies and the support of the geographic mobility of the workers (two contacts each). The respondent relies on a medium-sized network when dealing with issues related to attracting investors, businesses or (skilled) labour to the region (six), access to finance for companies and education/training/skill development (seven contacts each). Most contacts reported on the reorientation of previous productive resources (such as site and equipment), diversification measures and R&D/innovation (nine contacts each).

Figure 6: Networks related to different topics of regional industrial policy, respondent from north-east Romania



Source: *Eurofound survey among the participants of Eurofound's first RIPS.*

Role of human and financial resources, skills development and the culture of cooperation in strengthening institutional capacity for industrial policy

The institutional capacities of the case study regions, in terms of industrial policy, are heavily influenced by their institutional structure and level of autonomy. However, additional factors such as human resources (HR), the existence of internal support structures, capacity building activities, interdepartmental organisation as well as cultural aspects (Chapter 3) and the existence of regional implementing agencies (also in Chapter 3), have an impact on the institutional capacity necessary to successfully design and deliver regional industrial policy. In Eurofound's small survey among the participants of the first RIPS, for example, respondents mentioned the lack of information about what others are doing as the most important hindrance factor for not contacting other regional policy actors more often, followed by time constraints caused by too high a workload. Lack of a communication/cooperation/exchange platform/contact details, as well as lack of autonomy to decide upon cooperation, was also highlighted as a barrier.

Capacity building and skills

In terms of HR recruitment policy, the case studies reveal the existence of different patterns. In Baden-Württemberg (800 employees at the Ministry of Economy and 16–40 employees in the four implementing agencies), importance is given to hiring specialists with specific knowledge and background in the main priority industrial sectors of the region in order to work on the different areas of industrial development. Contrary to this, in Pays de la Loire, the staff employed by the regional council and other regional agencies responsible for industrial policy tend to have generalist (instead of sector-orientated) academic backgrounds in economics, management, law or political science. In Pirkanmaa, the employees of the regional council, the city government and the Centre for Economic Development, Transport and the Environment of Pirkanmaa (ELY Centre – the government's regional administrative authority in economic policy) are a mix of people with a background in regional development and in engineering studies. In Lombardy, the staff of regional directorates (the Directorate for Research and Innovation for innovation policy and the Directorate for Economic Development for competitiveness and trade) is made up of individuals who mostly have a higher education diploma, mainly in the fields of engineering, economics, physics and administrative science. This diversity of academic backgrounds is considered by the regional policymakers as a key asset of the regional administrative body.

The case studies have shed limited light on the adequacy of available human and financial resources for existing policy needs. In Lombardy, North Brabant, Pomorskie and Sardinia, staff and/or funding shortages were mentioned by some stakeholders as an important limitation to industrial policy capacity. For instance, in Lombardy, despite the large investments supported by the EU, along with national and regional funding, most interviewees say the region and the entrepreneurial ecosystem still lack the necessary funding to implement their projects.

In addition, most of the regional programmes supporting innovation and industry competitiveness are regularly oversubscribed, which illustrates a gap between supply and demand for support programmes. In Sardinia, the lack of funding was not mentioned in the interviews as a key obstacle for industrial policy. However, various interviewees complained about the lack of personnel and specialist skills in the regional offices.

Conversely, in North Brabant, the lack of a consistent flow of funds has had an influence on staff, with concerns over job security rising before the start of every new policy cycle. This also complicates long-term strategic planning. In Pomorskie, the Pomeranian Development Agency's resources have been growing steadily in recent years and enterprises seeking support for investments or innovation have well trained staff at their disposal and are considered to be well prepared to implement their assigned tasks. Nevertheless, a gap between the available amount of human resources and the portfolio of tasks and responsibilities has still been pointed out by some regional stakeholders.

Table 6 provides an overview of some of the key indicators of institutional capacity. The numbers are rough estimates based on the information gathered through interviews and study visits.

The case studies illustrate that initiatives explicitly meant to enhance institutional capacities for the design and delivery of regional industrial policy are scarce. This is also supported by the findings of the small survey among the participants of Eurofound's first RIPS; developing and maintaining skills and capacities in the involved institutions was the category least often indicated as a discussion topic with the most important contacts related to regional policymaking. Most examples cited in the case studies relate to either actions aimed at increasing the volume of funding going into this specific policy field, or initiatives aimed at reorganising institutional set-ups in order to allow for more efficient decision-making, management and communication within and between regional industrial policy stakeholders. For instance, in recent years the Lombardy regional authority has streamlined its organisational structure, and specific measures have been put in place in order to facilitate interservice collaboration. In 2014, the Directorate for Research and Innovation modified its internal organisation in light of improving the vertical and horizontal coordination with other directorates, as well as among its different units. This involved the creation of specific working units such as the Strategic Policy Building Unit, an interdirectorates group, a human capital working group, and a policy-learning unit. These units are in charge of coordinating the regional policy with the national government and the European Commission (Ciffolilli, 2016).

Pomorskie and West Romania are among the few examples of regions which have invested in capacity building activities and human skills enhancement to catch up with more advanced regions.

Throughout the years, leaders of the West RDA have been building on several EU-funded interregional exchange programmes (see the section on internationalisation in Chapter 4) in order to strengthen the RDA's capacity to design and implement regional economic development and innovation strategies. The region's first innovation strategy was designed with the help of the European Commission's Regional Innovation and Technology Transfer Strategy programme (funded under the Sixth Framework Programme for Research and Technological Development (FP6)). The project enabled the transfer of experience in innovation strategy-building from the Spanish partner region of Aragon. The main lesson learnt from this experience was the need to develop a regional innovation support body that could act as an interface between the demand and supply for innovation support at regional level, and provide hands-on innovation guidance to local SMEs. As a result, the RDA created the current Tehimpuls Regional Centre for Technology Transfer and Innovation in 2006, as a pilot project of the regional innovation strategy.

Further capacity development steps have been taken within Interreg projects, for instance the Managing the Industrial Territory in the Knowledge Era project (MITKE) to learn from other EU regions about the management of business and industrial parks,[11] but also as part of the Enterprise Europe Network. In addition, West RDA staff have participated in several training activities to gain more knowledge on hands-on SME innovation support, and have adopted the IMP3rove initiative that evaluates innovation management in companies as a method to help regional SMEs improve their innovation performance. Overall, the West RDA has grown into a more mature organisation with substantial strategic policy development capabilities and skills, showing resourcefulness in continuous attempts to adapt the rigid institutional environment to the regional stakeholders' needs.

In Pomorskie, investment has been made to train regional authority staff on the management of ESIF funding through training programmes supported by the technical assistance of the operational programme. The participation of regional staff in Interreg projects has also been a way of learning from other regions about the management, design and implementation of innovation and industrial policy.

Institutional capacity is not only driven by financial and human resources. It is also underpinned by other elements such as support infrastructure, information technology (IT) monitoring tools, or non-material factors such as the propensity to cooperate. These factors enable transforming tacit and implicit knowledge into explicit knowledge that can be shared across regional governments and industrial policy stakeholders (knowledge management).

11 See West RDA, MITKE project description (http://www.regiuneavest.ro/assets/fisa_mitke_web_eng.pdf).

Table 6: Overview of institutional capacities

	Baden-Württemberg	Catalonia	Lombardy	North Brabant	Pays de la Loire	Pirkanmaa	Pomorskie	Sardinia	West Romania
Approximate number of staff involved in industrial policy design and implementation at the regional administration and agency	800 staff at the Ministry of Economy with 16–40 employees in each of the 4 agencies	700	370	100	91	70	170	N/A	96
Background of staff in general	Specialists	Economists, master in public affairs, engineers	Engineers, economists, physics, administrative science	Economists, master in public affairs, engineers	Public affairs, economics, management and law	Regional development, engineering	Faculty of arts, economists	N/A	Economists, sociologists, regional developers
Operational budget (€ per year)	~€50 million	~€24 million	~€50 million	N/A	N/A	~€8 million	~€3 million	N/A	N/A
Project funding administered (€ per year)	N/A	~€50 million	€350 million ESIF + €2 billion	€125 million (Innovation Fund)	~€165 million	€125 million	Total development-orientated public spending for 2014–2020 is €11—€13 billion	N/A	N/A

Note: *Such a table has proved very difficult to establish and must be interpreted with great care due to different scale of regions, different national/regional and intra-regional institutional arrangements, and different understandings of regional industrial policy. By no means should it be used to develop formal cross-comparison among the regional case studies.*
Source: *Technopolis Group.*

IT tools

Regarding the use of IT tools to support and inform the decision-making process, the Lombardy case is worth considering. Established in 1981 by the regional administrative authority as a private service company, Lombardia Informatica provides ICT services and solutions such as software, hardware and operating systems to both the public administration and private sector. In particular, it aims to improve the effectiveness and the efficiency of the Regional Information System (RIS) in the fields of E-government, E-health and E-procurement, and maintaining the information system of the regional government. Lombardia Informatica has, for example, developed and adopted the QuESTIO (Quality Evaluation in Science and Technology for Innovation Opportunity) to support the monitoring process and Open Innovation platforms which are mainly aimed at supporting Lombardy's industrial policy design and implementation. This use of new IT tools to collect information and inform the policymaking process is a good practice.

Culture of cooperation

Another aspect in terms of institutional capacity that was highlighted in several of the case studies is the existing culture of cooperation among regional stakeholders. This capacity to interact with each other, to communicate and collaborate, is seen by regional stakeholders in many of the regional case studies as an important factor in helping to design and implement sound industrial and innovation policies. The regional stakeholders in Pays de la Loire, for example, characterised themselves as having a strong collective spirit of 'doing things together' that helped to follow the same policy orientation, particularly in advanced manufacturing where different policy initiatives and different stakeholders have converged to make the region the most advanced in France in terms of advanced manufacturing. In Pirkanmaa, regional stakeholders also see the 'consensus-seeking culture' as an important factor for the policymaking process. Discussions typically resolve any disagreements by arriving at a compromise, or by seeking another type of mechanism that allows the actors to work with each other. However, this type of attitude is not always positive since with a consensus, some important ideas can be lost. Another cultural feature is the openness of regional and local stakeholders and people towards new ideas and newcomers in general. It appears to be very easy to get involved and become part of the regional community, whether it is in political circles or business communities that facilitate innovative and fresh thinking.

Role of implementing agencies

Implementing agencies represent an important part of the regional industrial policy governance system. The capacity of regions to effectively design and implement industrial policies can be substantially enhanced by the existence of strong agencies that are capable of providing good technical expertise and that interact with the private sector. The involvement of these implementing agencies in the policy design process can also be a positive factor given their first-hand knowledge about what works (or does not) in a given regional context.

As an example, regional stakeholders consider the Finlombarda agency in Lombardy as a dynamic implementing agency, as well as a very good source of technical expertise, which feeds into the policy design and implementation process. Despite having limited autonomy and power in the decision-making process relating to the definition of regional industrial policy, the knowledge and expertise generated by the agency acts as a key input to the policymaking process. In Catalonia, it is the agency ACCIÓ that focuses its activity on the promotion and development of Catalan companies, through the implementation of support services that are necessary to promote competitiveness. Both of these agencies have gained very strong international reputations for the quality of their technical expertise in industrial policy.

In Sardinia, there are two main agencies with remits for industrial policies: Sardinia Research, which is in charge of managing the regional technological park, boosting technological transfer towards local companies (particularly innovative start-ups) and managing specific policies in support of innovative start-ups, and the Sardinian Agency for Active Labour Policies (ASPAL)[12] which is in charge of important regional programmes, especially on student mobility, and coordinates the network of regional employment offices.

The Tampere Regional Economic Development Agency acts as the marketing, investment, and economic and tourism agency in Pirkanmaa. It is not only an implementing agency, but also voices its own opinion and shapes policy agendas. It is considered to be an asset by the regional policymakers, since practical experience and lessons learnt (from running a support programme or a regional aid scheme) are instantly fed back into the next round of policy design. This approach integrates a policy monitoring cycle directly connecting strategy-making and policy implementation. However, its effectiveness depends very much on the capacities and skills of individual staff members in these agencies.

In Baden-Württemberg, agencies play an important role in shaping industrial development for four specific top priority sectors: BIOPRO Baden-Württemberg GmbH (Life Sciences), e-mobil BW GmbH, (electric mobility and fuel cell technology), Umwelttechnik BW GmbH (environmental engineering and resource efficiency), and Leichtbau BW GmbH (lightweight construction). These agencies exemplify an authority working under the supervision of the ministries in Baden-Württemberg, which operate as service providers at the crossroad between science, economics and politics. They are specialised in specific topics that are considered to be KETs and are instruments of the ministry. Yet, the bodies also operate as 'innovation agencies', shaping the regional landscape. Agencies were created to outsource responsibilities from the ministry to a lower internal bureaucracy. It was expected that the agencies could work more autonomously, as they would not be subject to the same bureaucratic rules or policy cycles as the ministry. Hence, even if they are financed by the ministries, they are organised as private limited companies. This principle

12 https://www.regione.sardegna.it/j/v/43?s=1&v=9&c=4920

has guided the development of a number of other similar agencies in different regional case studies.

The West RDA is also considered by the regional stakeholders as a dynamic organisation that contributes to strengthening policy capacity, policy intelligence and participation in numerous interregional and international projects. Such relatively new structures with highly skilled human resources can be instrumental in breaking through the institutional difficulties of central European countries.

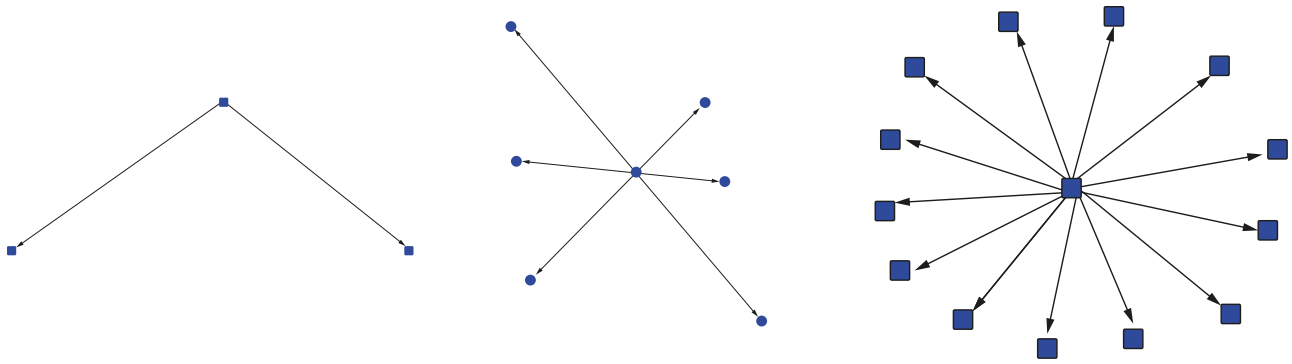
Agenda-setting processes

As previously mentioned, in the majority of case study regions (with the exception of West Romania), regional authorities play a driving and central role in supporting the long-term industrial development of the region; as well as in setting the regional industrial policy agenda. This does not mean, however, that other stakeholders, such as those that are national or local, or private sector actors, are not involved in or influence the policy agenda-setting process. The following trends have been observed across the case study regions.

- Regions are generally adopting multistakeholder approaches for the development of their industrial and innovation agendas and strategies.
- Regions are paying greater attention to consulting, building and opening dialogue with the industrial sector and, to a lesser extent, with higher education institutions.
- The public–private dialogue is generally structured around formal procedures, as well as a number of more informal communication and dialogue channels.

In spite of this general trend of increased networking in the policy design process, important differences can be observed across those involved. This can be illustrated by the responses to Eurofound's small survey among the participants of the first RIPS. The examples of the networks identified for policy design show that some of the respondents report very few key contacts – such as only one in the case of the respondent from southern Denmark, and two in the case of Catalonia and west Sweden (Figure 7). A medium number of key contacts is identified, for example, by the respondents from west- and north-east Romania (five and six, respectively) and Bochum, Germany (five contacts). The highest number of contacts relevant for policy design was reported by the respondent from Glasgow, UK (13 contacts).

Figure 7: Illustrative examples for networks related to policy design



Catalonia and west Sweden | North-east Romania | Glasgow (UK)

Source: *Survey among the participants of Eurofound's first RIPS.*

Increased importance given to multistakeholder approaches in setting industrial and innovation agendas

The great majority of regional authorities consulted as part of this assignment emphasised the importance of involving local stakeholders in regional development, industrial and innovation policy agendas and strategies. This is mainly carried out through the involvement of local authorities (cities and county councils), implementing agencies, private sector organisations and clusters, universities and research institutions and, to a lesser extent, NGOs and (in certain cases) citizens.

In some instances, such as in Baden-Württemberg, Pays de la Loire and Pirkanmaa, multistakeholder involvement has become a long-standing practice which is taken very seriously. In other regions such as Pomorskie and West Romania, the concerted agenda-setting process is a rather new practice which came with requirements set by European regional policy and corresponding funding, particularly through the implementation of the smart specialisation strategy approach.

For the past 10 years, all industrial and innovation policies in Pays de la Loire have benefited from a large and open concertation process initiated and led by the regional council. This process relies on the use of different channels of dialogue. For example, the drafting of the regional economic development strategy in 2006 was built on the organisation of 32 thematic workshops, out of which 10 were directly related to economic issues. Each workshop brought together regional partners and beneficiaries who were asked to react and debate the findings drawn from a pre-assessment exercise.

The large majority of regional stakeholders generally consider 'open approaches' to policy design as good practice, given that they help to build a common vision of key regional challenges to reach a consensus on the key policy orientations and sectors of specialisation. This in turn sets the basis for a more effective and efficient policy roll-out and implementation phase. In addition, this type of approach helps to address complex issues and challenges, given the involvement of different types of expertise and the different visions and perspectives coming from a range of different stakeholders. These assets are generally considered to be more important to regional policymakers than the difficulties generally associated with these approaches, such as higher costs, slower decision-making processes and the difficulties in building consensus. Some criticism of 'open agenda-setting' approaches was expressed by some regional stakeholders, such as in Lombardy, who state that there are too many stakeholders (cities, regional agencies, clusters, industry associations, chambers of commerce and NGOs) and different ministries involved in the policymaking process. According to these stakeholders, this occasionally leads to the inability to make appropriate and fast decisions. In Pays de la Loire, the high number of intermediary organisations, as well as the level of fragmentation of the policy ecosystem, was identified as a limitation of the current decision-making process. In Sardinia, the economic and social partnership meetings associated with structural funds were criticised on the grounds that there are too many participants and that they are too unfocused. Moreover, as they are run with no specific participatory methods, everyone can voice their own views irrespective of their knowledge of the topic and of their real representativeness.

A diversity of channels to foster formal and informal dialogue

The involvement of regional stakeholders in the industrial policymaking process across the study regions takes place through a combination of different formal and informal channels, processes and techniques (Table 7).

- **Stakeholder workshops**: To consult regional stakeholders on a specific topic (for instance technology transfer or industrial business parks) or sector in order to share a common vision on the challenges and main policy orientations.
- **Expert groups**: To gather expertise and knowledge from academics, scientists and technology specialists regarding a specific issue. This may include activities such as the peer review carried out in Pomorskie as part of the S3 design process.
- **Consultative commissions and committees**: Many regions have established regional committees, commissions or conferences that meet regularly (such as annually) and are open to the participation of regional stakeholders (private sector, universities and NGOs). These generally provide advisory services on regional plans and strategies, such as in North Brabant and Pays de la Loire.
- **Ad hoc conferences, seminars and workshops**: These are generally organised at the end of the decision-making process to present the result of the consultation and the strategy to a larger audience, as in the cases of Lombardy, Pays de la Loire and Pirkanmaa.
- **Permanent public–private dialogue:** Roughly half of the case study regions (Baden-Württemberg, Lombardy, North Brabant and Pays de la Loire) have established fora allowing for permanent dialogue among regional stakeholders. These are generally organised around a specific sector of activity.
- **Open competition, call for expression of interest**: Only Pomorskie used this approach (in 2014) for the design of the S3 strategy in order to identify and select the target areas of the smart specialisation. It is considered to be a big success given the high level of participation with more than 300 contributions received.
- **Open public consultation, calls for written contribution**: Some of the regions ask for written contributions through an online platform on, for example, regional policy challenges and orientations.
- **Informal procedures and interactions:** Some of the regions reported that in addition to formal processes (workshops, conferences and online consultation), the agenda-setting process is also the result of informal talks and networking between and across the regional stakeholders and policymakers in Pays de la Loire and Pirkanmaa.

Table 7: Overview of channels used for stakeholder participation in the agenda-setting process

	Stakeholder workshops	Expert groups	Consultative commissions and committees	Permanent public–private dialogue	Ad hoc conferences, seminars and workshops	Open competition, call for expression of interest	Open public consultation, call for written contribution	Informal procedures
Baden-Württemberg	N/A	N/A	N/A	Four industrial dialogues and Allianz Industrie 4.0	N/A	N/A	N/A	N/A
Catalonia	Stakeholders workshops	N/A	N/A	Agreement for permanent social dialogue	Number of seminars in the different territories of the region (territorial inclusion)	N/A	Written feedback online	N/A
Lombardy	Working group on cluster development	Expert group to challenge the results and needs from the working groups	Consultations of the industry associations and chambers of commerce through regular bilateral meetings with the regional authority	N/A	Seminar with other Italian regions to exchange on S3	N/A	Online publication of written contribution	Involvement of industrial entrepreneurs on a personal basis into the agenda-setting process
North Brabant	N/A	N/A	Several advisory committees providing advice to the regional authority	Top sector governance	N/A	N/A	N/A	N/A
Pays de la Loire	Thematic workshops involving different stakeholders	N/A	Regional conference on economy and sustainable employment (CREED)	'Contrat de filière' or sectoral contract	Seminar and conference for presenting the strategy	N/A	Online publication of written contribution	Strong interpersonal networks between different stakeholders
Pirkanmaa	Workshops involving different stakeholders including private sector and universities	N/A	Advisory board steering the S3 (universities, enterprises, municipalities, intermediary organisation, council of Tampere region)	N/A	Policy forum with regional policymakers and stakeholders	N/A	N/A	Strong interpersonal networks
Pomorskie	Thematic workshops	Expert meetings and peer review	N/A	N/A	N/A	Open competition for the identification of the target areas of the S3 through a call for proposals	Online publication of written contribution	N/A
Sardinia	Thematic workshops involving different stakeholders	N/A	N/A	Economic and Social committee	N/A	N/A	Online publication of written contribution	Strong interpersonal networks between different stakeholders
West Romania	Thematic working group involving the private sector	N/A	Regional development council	N/A	N/A	N/A	N/A	N/A

Source: *Technopolis Group.*

The case studies revealed a very mixed approach to the use of these channels and techniques, which does not necessarily follow a structured series of steps. In some cases, the combination of the different techniques is used to gradually or continuously identify relevant topics and areas of regional specialisation, as well as to support coordination across the private sector, the civil society and the regional research system. In Lombardy, an independent forum has been established which is aimed at fostering a public debate and agenda-setting process on the impact of science and technical innovations on the regional economic system. Through the definition of participatory methods and tools, this forum, which is headed by the regional authority, involves the different regional stakeholders including civil society representatives, the scientific community, representatives of the nine Regional Technology Clusters, and other regional innovation system stakeholders.

In West Romania, a regional planning council was organised and coordinated by the West RDA. This council includes representatives from the main public administration bodies at regional, county and local levels (county administration, county councils, local governments, and Growth Pacts) and external stakeholders (local public services authorities, local NGOs and the private sector) represented by the chambers of commerce, local clusters and individual local entrepreneurs. These stakeholders are organised in thematic working groups to define development priorities. Their role has been a consultative one in the formulation of priorities; thus the county-level and local public administration bodies have had an important say in the design of the regional economic development plan.

Fora for permanent public–private dialogue

Among these different techniques and processes, the establishment of permanent public–private dialogue fora, such as those implemented in Baden-Württemberg (industrial dialogues) and Pays de la Loire (sector contracts, *contrats de filière*) are worth highlighting. Generally established on a sector basis (with the exception of Catalonia), these set out the basis for a long-term dialogue between regional policymakers and the private sector in comparison to consultative workshops, expert committees, commissions and online contributions that are organised as one-off activities for the design of a specific regional strategy or plan. They also tend to be more focused on enabling a technological or an industrial sector to delve deeper into the identification of challenges, problem analysis and problem-solving with the prime stakeholders. At the same time, stakeholders involved in this permanent dialogue make an important contribution to the implementation of agreements reached: their participation increases the ownership of the consensus reached through this dialogue.

In Baden-Württemberg, dialogues are supervised and initiated by an official of the Ministry of Finance and Economic Affairs. The aim of the dialogues is to detect sector-specific problems or challenges early on, to ensure that the ministry is informed about sector-specific developments, and to facilitate the exchange among concerned stakeholders (the type of stakeholders involved in the specific dialogues depends on the sector). Typically, these cover representatives from labour organisations and industry associations, as well as researchers from respective fields. In addition, the format of the dialogue (such as conferences or workshops) and the sequence of the events vary. For the industrial dialogue on mechanical engineering, participating members and representatives (ministries, trade unions and business associations) decided on the format together. The participants generally consider the dialogue as useful, given that it serves as a platform to get in contact with groups and organisations that are normally hard to reach, such as scientists and large companies.

Pays de la Loire also deploys an interesting policy coordination scheme with the objective of boosting the voice of industry in the policymaking process. Policymakers and key economic actors establish ‘sector contracts’ with the objective of strengthening and organising the work for a specific thematic or sectoral area, establishing joint targets, and coordinating the national and regional public and private actions and investments. For additional information on policy multilevel governance coordination mechanisms, see section ‘Coordination between the regional and national levels’, below. For instance, the sector for mechanics and materials has signed two three-year contracts since 2008. The latest contract covering 2011–2014 was established between the central government, the regional council, the Development Committee of Mechanic and Material Industries (CDM), the competitiveness cluster EMC2 and the business cluster Neopolia. The objective was to strengthen interfirm cooperation, improve R&D and training, be more aggressive about international development, and to develop an effective policy intelligence tool. The contract also set out quantitative objectives: to support 1,000 enterprises, to involve 500 enterprises in at least 1 of the 3 participating business organisations (CDM, Neopolia and EMC2) and to involve 50 regional companies in support schemes.

In Catalonia, the government signed an Agreement for Permanent Social Dialogue with economic and social agents (primarily business representative associations and unions) in April 2014 with the objective of boosting economic recovery and social justice. This agreement contained a set of urgent measures aimed at mitigating the effects of the economic crisis on employment, the level of welfare and the survival of businesses. It was structured in four sections, including two packages of extraordinary measures, the second of which aimed at boosting the economic competitiveness of the region, through actions that would be implemented in the medium and long term. One such measure was designed to ‘boost the industrial policy of Catalonia’. The Ministry of the Presidency was held directly responsible for coordinating the work of monitoring this agreement, which set out a more formalised process of agenda setting that culminated in the new industrial policy and its action plans (2016) for the seven different thematic areas and economic sectors.

Informal procedures

Informal procedures, discussions with industry representatives, and political clubs have also been

mentioned as an important way of influencing the regional policy development process. Such informal discussions are initiated by regional governments (some policymakers seek the opinion of key industrial actors) and occur through direct consultations of key individuals, rectors, directors of industrial associations and large companies (as in Pirkanmaa). In Pays de la Loire, the *Jeu à la Nantaise*, the capacity to work as a single team, is considered by the regional stakeholders as a powerful informal channel for consensus building. This expression was used several times during the interviews conducted as part of the regional case study. It refers to a strategy deployed by the Nantes football team in the 1990s and used in football journalism. Its meaning roughly corresponds to attacking play and good teamwork. Interviews also revealed that some key civil servants have worked in this field for a long time (15–20 years) assuming job positions in different key public institutions in charge of economic development. This has facilitated their development of informal contacts and the delivery of quicker collective responses to new challenges.

Box 7: Multistakeholder involvement in regional industrial policy processes

The involvement of different types of actors – at different administrative levels – in the regional industrial policy design requires some form of cooperation and coordination mechanisms to ensure an effective and efficient design and implementation. OECD (2004) exemplifies four different models:

- regional strategic platforms foster cooperation between stakeholders in the design and implementation of sustainable economic development strategies, and stimulates innovation through the building of clusters and the establishment of links between companies and research organisations;
- area-based partnerships concentrate on socioeconomic problems rather than on economic development;
- open government refers to 'a way of increasing participatory democracy' by giving the civil society a say in local governance and encouraging feedback from the people on the ground, for example through public hearings;
- agents of change often complement other forms of local governance by involving community leaders to mobilise resources towards common interest projects.

These models are supplemented by the following measures that could be implemented to improve coordination of policy stakeholders (Charbit and Michalun, 2009; Charbit, 2011):

- legal measures;
- contracts (as experienced in France, Italy and Spain);
- vertical and horizontal integration mechanisms;
- municipal mergers or cooperation (such as in Denmark, Finland, France and Spain);
- the creation of coordinating bodies;
- ad hoc or informal meetings;
- monitoring of regional performance.

While such cooperation and coordination mechanisms can be both formal and informal – or a combination of both – they are alike in that they do not come into existence automatically but need some impetus. Indeed, OECD (2012) as well as the discussions in the first RIPS, stressed that some of the main bottlenecks to regional growth are gaps in the multilevel governance frameworks, as well as the poor mobilisation of stakeholders. This might be caused by information irregularities between the different stakeholders, a lack of resources (human, financial, knowledge or infrastructure), mismatches between revenues and expenditure responsibilities and between administrative boundaries and functional economic areas, as well as between policy orientations at different administrative levels (Charbit and Michalun, 2009).

The discussions in the first RIPS also highlighted that next to some coordination mechanisms (which include 'soft governance' in terms of informal relationships), there is the need for some form of leadership to drive the process and for the advocacy of individuals with political power to ensure its implementation. While there is insufficient evidence available on the role of such a leader, there was common agreement among the seminar participants that the leadership should be anchored at regional, rather than at national level in order to ensure that it remains a regional approach, and to facilitate preparation and implementation based on trust.

Policy implementation coordination mechanisms

Coordination within regional authorities, and between regional and subregional governments

The existence of coordination mechanisms within the regional authorities, as well as between the regional and subregional levels of government, can be considered as essential for the success of industrial policy implementation. This is mainly due to the strong links that industrial policy has to a number of other policy domains, such as education and training, employment, energy and the environment; as well as to the many ways in which it may affect different levels of territories at the subregional level.

As a result, the study regions have all developed strong coordination mechanisms to align the different sets of priorities, to coordinate the interventions of different

regional departments and units, and to align the interests of the different subregional authorities (such as counties and cities). The importance of such coordination has been particularly highlighted in Baden-Württemberg, Lombardy, Pays de la Loire and Pirkanmaa. However, as illustrated in the following paragraphs, the case study regions have varying practices in terms of formal and informal policy coordination platforms.

Coordination within the regional authority in Baden-Württemberg is more formal. The exchange and coordination between the different ministries is mainly structured by two legal principles stemming from the federal level, namely the 'departmental principle' and 'checks and balances'. The first principle assigns the responsibility of one thematic policy area (such as 'cluster policies') to one ministry. The assignment is made at the beginning of the legislative term and noted in the distribution-of-business plan. Hence, the discussion of the respective topic is then led/coordinated by the assigned ministry. The principle of 'checks and balances', however, requires that ministries monitor the processes in the other involved ministries and intervene or start an exchange if their own principles or themes are affected. If the conflicts of interest or overlaps are too strong, interministerial exchange groups are established for officials to exchange their points of view to coordinate their interests. Whether an interministerial group is established, whether discussions are bilateral, or only based on the exchange of documents, depends mainly on the situation, the topic and the extent of overlap. Generally, the topics, as well as the first ideas on how to proceed and whom to involve, arise at operational level and are then discussed with the head of department. In other cases, topics may emerge from the top-down approach, for example from the ministerial level or the head of department. Then, the relevant divisions have to work on the topic and sort out whom to involve and how to proceed. Some topics, such as digitalisation, required an increase in interministerial exchange which therefore led to the organisation of common programmes and events (digitalisation, for example, is a horizontal topic and falls under the responsibility of different ministries). In the case of digitalisation, the interministerial exchange had been fixed in the coalition agreement of 2016. Another example was the establishment of the 'learning factories at vocational schools', which were carried out in cooperation with the Ministry of Science. While the Ministry of Economics provided ideas and resources, the Ministry of Science took care of teacher education.

Pirkanmaa, however, relies more heavily on informal policy coordination mechanisms. Issues related to policy and project implementation are discussed through informal interactions among local stakeholders. All interviewees were of the opinion that it is this informal cooperation and unofficial interaction which plays a very important role in the local policy landscape, and which tends to take place through personal networks. The lack of formal policy coordination mechanisms is not perceived as a problem, as such, given that a systematic approach to discussions with relevant regional stakeholders and businesses is implemented through the personal contacts of the directors in the city council. In this respect, policy coordination mechanisms are very much linked to specific people. As such, changes of personnel can cause disruptions in the system and in the diffusion of ideas and interests. An additional downside to this approach is that the project-based policy implementation process tends to be isolated and fragmented, where consistency and continuity over time is missing (where a formal policy coordination mechanism might help to mitigate this issue). An additional negative side-effect linked to this approach is that policy coordination is considered as non-transparent, and more difficult to understand and to engage in for newcomers.

Coordination between regional and lower levels of government (such as counties and cities) was observed in all the case study regions, mainly by means of working groups (Pomorskie) or regular meetings and commissions (Baden-Württemberg, Lombardy, North Brabant and Pays de la Loire). In Pomorskie, the three cities of the Tri-city area play an important role in shaping regional industrial policy through their participation in the Metropolitan Board, established in 2013 by the Marshal Office of the Pomeranian region as a (sort of) coordination platform. The Tri-city area (Gdańsk, Gdynia and Sopot), is the main centre of economic growth and recorded the highest GDP per capita as well as the lowest unemployment rate (4.5%) in 2015. It hosts a unique assembly of academia, with 26 institutions offering a wide range of education at the highest level. The Tri-city area is recognised as a metropolitan area by the Polish government and is represented by the city's governments, but there is no specific joint plan developed at the Tri-city level. The Metropolitan Board is composed of representatives of the Pomeranian Regional Assembly and the city councils of Gdańsk, Gdynia and Sopot which meet on a quarterly basis. The Metropolitan Board is based on voluntary participation.

Coordination between the regional and national levels

In the regions with high levels of autonomy, such as Baden-Württemberg and Catalonia coordination mechanisms between the national and regional levels of government tend to be more limited, compared to regions with limited levels of autonomy. In the those regions, coordination takes place in a formal manner in the framework of the federal or national assembly, or in more theme-specific conferences of government departments. This arrangement does not prevent the federal or national ministries and institutions from serving as a driving force for pushing one specific topic on the agenda. However, policy-learning may also work in the opposite direction; if certain instruments are proven to be successful at regional level, they are taken into consideration at the national level or are applied in other regions; for example, the regional policy measure of innovation vouchers was first introduced in Baden-Württemberg before its expansion to other German regions.

In the majority of the regions, however, explicit coordination mechanisms have been set up in order to align regional industrial and innovation policies with the national policy frameworks, as well as to monitor the implementation of joint programmes which are

co-financed by different levels of government. These mechanisms often take the form of a contract (Pays de la Loire and Pomorskie), a joint agreement (Lombardy) or a pact (Pirkanmaa) signed by the involved parties.

In Lombardy, the main operational instrument to ensure vertical coordination between regional and national industrial and innovation policies is the Framework Programme Agreement, which was signed by the regional authority, the National Ministry of Economic Development, and the National Ministry of Education, Universities and Research (MIUR). This agreement focuses on innovation and research activities in the sectors of agriculture, aerospace, sustainable construction, automotive, energy and renewable energy. The agreement, signed in December 2010, represents the first step in the implementation of a previously signed Memorandum of Understanding, aimed at launching a series of common actions between the region and the ministry, involving the areas of university and research. Some of the main goals of the agreement include:

- exploiting relevant knowledge produced at regional level and to intensify collaboration among different players;
- boosting the competitiveness of Lombardy's industrial sectors by building on R&I;
- preserving the competitiveness of long-established local productive systems;
- enhancing the scientific basis in biomedical and oncology sectors by building on the high-quality research institutions in Lombardy;
- boosting employment of R&D personnel.

The establishment of technology clusters at regional and national levels is a good illustration of how this kind of vertical coordination works. The Regional Technology Clusters' initiative is coordinated by the regional administration but linked to the National Technology Cluster initiative promoted by the MIUR since 2012. The aim of this national policy is to aggregate regional Technological Districts on some specific issues of strategic interest to the national domestic industry, promoting the development or creation of a single nationwide cluster for each area.[13] These national clusters are intended as instruments for the coordination of technology areas that are of strategic interest for national competitiveness and for the aggregation of regional nodes of expertise, research proposals and projects. It is also a way for the national government to limit any form of competition between the industrial sectors of the regions, and to build, instead, complementarities across the regions in industrial sectors.

In Pirkanmaa, the national and local authorities record their cooperation agreement in Growth Pacts, which were launched by the current central government. The government collects taxes and a part of this is allocated to the cities through the Growth Pacts, which includes a decision on the budget and a plan of how the cities wish to spend the money. The cities are free to come up with their own policy development goals and support measures, but they are checked and appraised at the national level through this process. There are also national level objectives disseminated through the Growth Pacts, such as increasing the amount of public procurement for innovation, as well as at regional level.

In Pomorskie, the Territorial Contract is a multilevel coordination mechanism between the regional and national government represented by the Ministry of Regional Development. The aim of the Territorial Contract is to oblige regional and national levels to coordinate their policies and policy instruments, and agree on key strategic development priorities and major projects.

In West Romania, overall, the coordination between the national and regional level is (broadly speaking) weak, despite the region's low levels of autonomy. National ministries do not systematically consult the regions specifically when designing policies. Also, the regions do not always keep in mind the various funding instruments these ministries offer, since the applications to these funding opportunities are generally managed centrally at the national level. The RDAs do not have to report to the Ministry of Economy or the Ministry of Education on the implementation of funding programmes. The Ministry of Economy has territorial bodies that support the implementation of SME support funds, but it does not have a specific role in policy coordination with the regional level. Only in the case of the Regional Operational Plan (ROP) funded by structural funds, does the Ministry of Regional Development consult with regions on development priorities. The RDAs, as intermediary bodies for the implementation of the ERDF, are in direct contact with the Ministry of Regional Development and Public Administration (which is also a managing authority for the ROP).

Interregional coordination

An additional level of coordination – of less relevance to industrial policy – takes place among different regions within the same country. This type of coordination has been observed in most case study regions. In West Romania, West RDA took over the presidency of the Association of Romanian RDAs in 2016 and announced that the body should take more initiatives and advocate for an enhanced role for the regions in the policymaking process. In Pays de la Loire, the regional authority participates in working groups of the Association of the French Regions. These fora, associations and conferences, however, are mostly lobbying for their own interests through the national government or the European Commission; rather than working to develop concrete and practical joint collaborations and projects across the regions.

In Italy (Lombardy and Sardinia), a very important source of coordination between the national and regional level is represented by the Conference of Regions and of Autonomous Provinces. The conference aims to define

13 The ministry has identified nine scientific and technological areas for the creation and development of clusters: aerospace; agro-food; green chemistry; smart communities technology; smart factory; transport and mobility systems for land and ocean surfaces; energy; life sciences; technologies for living environments.

common positions on the shared interests of Italian regions (and autonomous provinces) in order to lobby the national government, the Italian parliament, other Member State and EU institutions. The conference has a president, a vice-president, a board (*ufficio di presidenza*) and is divided into 11 committees corresponding to as many sectors. The most relevant committees for industrial policies are community and international issues, infrastructure and mobility, education, employment, innovation and research, and manufacturing activities. Each committee has a coordinator – one of the 20 Italian regions is entrusted by the other regions to coordinate the activities for a period coinciding with the legislative period of most of the regions – and follows its own agenda and priorities. Regular meetings are organised in order to discuss specific issues and to define specific lobbying strategies.

The most notable example of interregional cooperation identified as part of the study is the 6City initiative (*6Aika*) in Finland. It is a joint initiative set up by the central government between the six largest municipalities in Finland: Helsinki, Oulu, Tampere, Turku, Espoo and Vantaa (in the wider Helsinki Metropolitan region), as part of the Finnish implementation of EU Cohesion Policy for 2014–2020. This initiative builds on previous Smart City projects in Finland and has three 'priority axes': open innovation environments; open data and interfaces; and open participation and customership. The 6City strategy is implemented via collaborative projects that enable the cities to experiment with technologies and innovations in a larger context than just one city. The aim of the projects is to duplicate and scale-up innovative ideas across the network of cities, and to offer companies that develop, test and experiment the innovations a larger business market. The final objective of the initiative is to create new businesses, know-how and (ultimately) jobs in Finland. Since 2014, the six cities have launched 26 projects with a total budget of €45 million. The project portfolio ranges from smart mobility, clean tech and agile piloting, to creating development environments for product-testing and boosting open data for business. Through this initiative, the regions share their challenges, technologies and solutions to address them.

Use of policy intelligence: Production of knowledge, observation, benchmarking more than foresight

On the basis of their function in the policy and decision-making context, the policy intelligence tools used by the case study regions may be categorised as follows (see also Chapter 3):

- production of knowledge on specific issues, such as an industry sector, a specific technology or a specific support scheme through the production of studies, reports and/or working papers;
- observation of regional macroeconomic (at the territorial level) or microeconomic (at company level) data to monitor performance trends against a set of indicators through the existence of observatories and surveys;
- benchmarking to provide comparisons on the performance of the regions against other comparable regions, and to learn from other regions;
- the foresight to anticipate the development within a specific industry sector.

The policy intelligence tools and their regional use can be found in Table 8.

The case study regions have strongly developed such knowledge, observation and benchmarking functions. These are frequently considered by regional stakeholders as valuable elements which feed into the decision-making process on industrial and innovation policies.

In terms of knowledge production, regional authorities together with some stakeholders, such as regional agencies or chambers of commerce, regularly commission studies and reports to external providers (such as the universities in Pirkanmaa) or produce internal working papers (Government of Catalonia).

The observation function is also well-developed within the regions (with the exception of West Romania, which relies on the national statistics office). The regions with a high level of autonomy (Baden-Württemberg, Catalonia, Lombardy and Sardinia) have their own regional offices for statistics which are in charge of collecting macroeconomic data and produce regular reports and surveys on the regional enterprise and industrial sectors. However, even in regions with more limited autonomy (Pays de la Loire and Pomorskie), the regional authorities are equipped with regional economic observatories. In Pays de la Loire, the regional development and innovation agency has a dedicated observatory called the Socioeconomic Regional Observatory (ORES)[14] created in 2006. ORES collects and analyses data from a large number of regional observatory structures (around 40 at subregional, regional and national levels) in various thematic areas such as the economy, employment and the environment. It also produces various kinds of studies and knowledge products including briefing notes which clearly depict the regional economic landscape and its development over a short period of time (for example, quarterly publications of industrial production data and a selection of innovation showcases identified in the selected regional sectors).[15] The observatory produces foresight reports and up-to-date information on the sectors identified in the smart specialisation strategy (22 sectors). The data are used internally by the regional innovation agency and the regional council to inform the decision-making process and to monitor the implementation of the strategy.

At European level, several of the case study regions are involved in multiple international cooperation projects and initiatives, which represent an important source of policy intelligence and potential benchmarks. In

14 http://ores.paysdelaloire.fr/
15 http://ores.paysdelaloire.fr/1084-l-innovation-des-filieres.htm

particular, Baden-Württemberg, Catalonia, Lombardy and Pirkanmaa are strongly engaged in international cooperation activities, mainly through their participation in EU-sponsored initiatives (such as the Danube Region Strategy and the Baltic Sea Macroregion) and interregional networks (such as Four Motors for Europe[16] which brings together Baden-Württemberg, Catalonia, Lombardy and the Rhône-Alpes region in France). Interestingly, some of the regions, such as Baden-Württemberg and Catalonia, rely on benchmarking exercises not only to inform the decision-making process and to exchange experiences, but also to showcase their regional economic strengths and attractiveness for territorial marketing purposes. Additional information regarding the role of international cooperation in the context of industrial policy implementation at the regional level is presented in Chapter 4.

Foresight exercises,[17] however, are less widespread among the case study regions. Obviously, the previously-cited production of knowledge through reports, studies and the monitoring of regional economic and industrial performance through observatories, contribute to efforts to anticipate industrial and sectoral changes in the short, medium and long term. However, given that these exercises do not support stakeholders in actively shaping the future, they cannot be considered as fully fledged foresight exercises.

In Pirkanmaa, regional foresight exercises have been used in the past in order to shape the policy response process of regional actors to certain challenges. For instance, the danger of overdependence on Nokia had been anticipated several years in advance through such a foresight exercise which investigated the future of the ICT sector. This process was found (by the regional stakeholders) to have a positive impact since regional actors were prepared for the upcoming job losses. In 2012, as a response, they launched a project called Tampere New Deal 2015, which was seen as 'a preventative partnership concept (region, state, universities, innovation agency, private sector) to face the acute and forceful structural change situation' focusing particularly (but not exclusively) on the ICT sector. The New Deal also incorporated Nokia Bridge, a national programme to help former employees find new jobs or to create start-up companies (Vallance, 2016).

In Pays de la Loire, an interesting practice was initiated and developed in 2006 by CDM,[18] in collaboration with the UIMM[19], the Technical Centre for Mechanical Industries (CETIM), the West Plastics Industries Association (Plasti-ouest), the Federation of Mechanical Industries (FIM) and the Regional Chamber of Commerce and Industry (CCIR). This initiative received funding in its early stages from the regional council and the central government. The CDM regularly produces foresight reports on industry trends, based on interviews with a network of around 300 chief executive officers (CEOs) of regional SMEs and large companies, and collects facts that are not available anywhere else. The idea is to spot 'weak signals' and to anticipate market changes. The information obtained from the surveys is discussed with a panel of CEO members of CDM, who are also part of different regional committees and commissions established by the regional council. The initiative was expanded in 2014 to the Brittany and Nord Pas de Calais regions (renamed Hauts de France in 2016).[20]

16 Four Motors for Europe is a long-lasting cooperation between the regions of Baden-Württemberg, Catalonia, Lombardy and the Rhône-Alpes (France). Historically, the goal of this cooperation was to contribute to the internationalisation of the regions, and to promote the role of the regions in Europe and within the European institutions. The strategy developed by the Four Motors in recent years has focused on the reinforcement of the competitiveness in economy, sciences and technologies of the four regions, in this particular context of global interdependence and economic crisis.

17 Foresight is a systematic, participatory, future intelligence gathering and medium-to-long-term vision-building process aimed at enabling present day decisions and mobilising joint actions. It can be envisaged as a triangle combining 'Thinking the Future', 'Debating the Future' and 'Shaping the Future'. Foresight 'invites us to consider the future as something that we can create or shape, rather than as something already decided' (http://forlearn.jrc.ec.europa.eu/guide/1_why-foresight/characteristics.htm).

18 Comité de développement des industries mécanique matériaux: https://reseaulia.com/space/cdm

19 http://www.ui44.fr/

20 Publications available at https://reseaulia.com/space/cdm/contents/?orderBy=creationDate&listFormat=default

Table 8: Policy intelligence tools

	Knowledge	Observation	Benchmarking	Anticipation and foresight
Baden-Württemberg	Specific reports and studies, normally conducted by external research institutions Number of industry-specific reports commissioned by the regional development agencies	Chambers of commerce survey up to 9,000 enterprises (three times per year) to monitor the economic and financial situation of the local companies Statistical Office of Baden-Württemberg is monitoring economic data and provides two annual surveys: *R&D monitor* and *Innovation index*	Country-level comparisons often used as a way to compare and to showcase the strengths of the regional economy Participation in the Danube Region Strategy (EU-sponsored initiative) and in the Four Motors for Europe	No formal foresight exercise reported (except for the previously mentioned studies)
Catalonia	Specific reports and studies and working papers (outsourced and produced internally by the regional authority and agency)	Business Development Unit (formerly Observatory for Industrial Foresight) Catalan Innovation Barometer (produced on a yearly basis by the regional agency)	Country-level comparisons often used as a way to compare and to showcase the strengths of the regional economy Participation in Vanguard Initiative for New Growth through Smart Specialisation and Four Motors for Europe	No formal foresight exercise reported (except for the previously mentioned studies)
Lombardy	Specific reports and studies commissioned by the regional authority and the regional agency Finlombarda	Regional Office of Statistics (Eupolis Lombardia) Regional Innovation Scoreboard (17 indicators) QuESTIO software to monitor the regional development of the S3 sector of specialisation	Use of EU cooperation initiatives for benchmarking purposes (and joint collaboration) Participation in Vanguard Initiative for New Growth through Smart Specialisation and Four Motors for Europe	No formal foresight exercise reported (except for the previously mentioned studies)
North Brabant	Specific reports and studies commissioned by the regional authority	BrabantKennis platform (independent development council)	N/A	No formal foresight exercise reported (except for the previously mentioned studies)
Pays de la Loire	Specific reports and studies commissioned by the regional authority, the regional agency, the chambers of commerce and the regional observatory	ORES aggregating data from 40 regional organisations	Country-level comparisons often used as a way to compare and to showcase the strengths of the regional economy	CDM, initiated by the industry associations, is producing foresight analysis, identifying 'weak signals' through annual interviews with 300 regional CEOs Regional Observatory of Industrial Competences (ORCI) established in 2012 for anticipating human resource and skills trends in the industry sector

	Knowledge	Observation	Benchmarking	Anticipation and foresight
Pirkanmaa	Specific reports and studies (universities as the main provider)	Observatory collecting performance indicators ('situational picture') on the region and providing statistics	Collaboration programme with other national regions ('6 City strategy')	Regional foresight exercises
Pomorskie	Specific reports and studies commissioned by the Marshal Office (the regional authority)	Pomeranian Economic Observatory includes annual surveys on SMEs and provides feedback on effectiveness of policy measures	Participation in the Baltic Sea macroregion	No formal foresight exercise reported (except for the previously mentioned studies)
Sardinia	N/A	Regional Statistics Office drafts various reports on the main regional macroeconomic trends, particularly labour market, business, exports, tourism, agriculture. The employment observatory is in charge of processing and publishing reports on the regional labour market and can rely on a large dataset, which includes data on labour supply and demand. The observatory releases quarterly reports on the main regional labour market trends.	N/A	N/A
West Romania	Specific reports and studies commissioned by the regional authority	N/A	Use of World Bank to perform benchmarking analysis of the regional specialisation, R&I performance	No formal foresight exercise reported (except for the previously mentioned studies)

Source: *Technopolis Group*

4 Policy implementation

The practical modalities of industrial policy implementation across the case study regions vary substantially. Yet, there are a number of common elements and trends both in terms of the types of policy tools being used, as well as the methods of implementation. The policy mix cannot be taken as a direct translation of policy strategies into practice. The fact that overarching policy strategies exist and provide a specific policy orientation, does not automatically mean that these are perfectly transposed into concrete policy measures and actions. Policies laid down on paper remain broad, and policy measures that are implemented are the result of a further process of policy articulation. In general terms, case study regions' policy mixes appear to be in line with the overall policy objectives and directly, or indirectly, address regional economic and labour market challenges. Sometimes the interactive nature of developing and drafting a strategy that results in good policy discussions and an alignment of interests is more important than following the document word for word. This aspect (although in different forms) has been explicitly highlighted in Pays de la Loire, Pirkanmaa, Pomorskie and West Romania.

The following sections compare and contrast the different regional approaches to industrial policy implementation.

Industrial policy mix

The industrial policy mix refers to the combination of policy instruments and programmes used by regions to translate strategic objectives into practical activities at ground level. They tend to cover a broad number of policy instruments, which vary in terms of their objectives, field of applications, targeted audiences and beneficiaries, and the organisations and institutions responsible for their funding and management.

Box 8: Regional industrial policy mix – a theoretical perspective

Warwick (2013) points out that instruments used in industrial policy range from targeting product markets (such as addressing competition and anti-trust, product market regulation and exchange rate policies), labour and skills (education policies and employment incentives), capital markets (corporate tax and investment promotion), infrastructure, and technology (including the promotion of R&D and public procurement for innovation) to institutions. They can be narrow (subsidies to specific companies or workers) or broad (initiatives to improve the overall business environment, for example labour or financial market regulations), that is 'selective' or 'horizontal'.

Similarly, Bosch (2014) classifies supply side policy interventions (such as R&D support, access to finance, education and skills, and land use) and demand side interventions (procurement, regulation, standards, support to end demand and export promotion). Furthermore, other framework policies are highlighted as relevant, including energy security, intellectual property rights (IPR) regimes, infrastructure, industrial relations and taxation.

Centralised versus diffused policy mixes

Among the key differences across the policy mixes of the case study regions is the extent to which they are managed centrally, or distributed across a broad range of implementing agencies and government levels.

In some of the regional cases, regional industrial policy is implemented through a set of policy instruments that are, for the most part, managed and overseen by a single player, such as the regional government or administration. This does not mean that the policy mix is limited to a reduced number of policy instruments, but rather that the control over the implementation of the policy mix (and the funding) is concentrated in the hands of a small number of stakeholders.

Such centralised policy mixes can be observed in the case of Catalonia, Lombardy and Sardinia where most policy measures are linked to the regional government or their agencies (see Chapter 3).

In other cases, however, given the very high number of policy initiatives and actors in charge of their implementation, regional policy mixes can be described as being more 'diffused'. This is clearly the case with the Pirkanmaa region where there is no single industrial policy mix that is fully aligned. Instead, different actors at different levels aim at creating the right framework conditions and provide support services for businesses to grow and innovate. The structure of the policy mix of West Romania can be described as dual or hybrid, given that different national and regional level measures influence the policy mix.

The either centralised or diffused nature of the policy mix is mostly a consequence of the administrative and institutional set up of the regions and their respective countries. The structure of the policy mix does have important implications for the types of coordination mechanisms and vice versa, which are required in order to avoid repetition and fragmentation; as well as to increase coordination across the whole system.

Diverse policy instruments despite the need for critical mass of public support

One of the key overarching observations from the review of the regional case studies relates to the level of diversity of policy instruments, which make up the policy mixes of case study regions.

Box 9: Policy areas relevant for regional industrial policy

Industrial policy is often embedded in regional development, economic, investment or innovation policies and is linked to education and skills formation, research, trade, competition and regulation polices (Di Maio, 2013). Accordingly, the following policy areas are mentioned in the literature as the most important ones touched on by regional industrial policies:

- competition policy (OECD, 2009; Owen, 2012);
- internationalisation policy (European Commission, 2010);
- entrepreneurship and SME policy (Giguere, 2007), where the findings of the first RIPS state that there should be a focus on start-ups and scale-ups as well as the sustainability of businesses, and similarly, on SMEs and large companies;
- cluster policy (OECD, 2007; European Commission, 2010 and 2012);
- innovation policy (European Commission, 2010; Bosch, 2014);
- education and skills policy (OECD, 2010; Owen, 2012; Florida and Mellander, 2015; Lehmann, 2015);
- labour market policy (Pianta and Cirillo, 2008; Barr et al, 2012);
- cohesion policy (Hix, 2005; Ferry and McMaster, 2013; Pucher et al, 2015a and 2015b);
- infrastructure policy (European Commission, 2010; OECD, 2010).

A common trait of the policy mixes is that they generally comprise support measures dealing with aspects such as:

- business support, business competitiveness, entrepreneurship and internationalisation;
- R&I, technology transfer, industry–science cooperation;
- access to finance.

Some regions also include provisions for:

- education and skills development;
- infrastructure;
- regulatory action to improve business environments.

Table 9 illustrates the diversity of policy instruments.

Table 9: Overview of types of policy measures applied

	Baden-Württemberg	Catalonia	Lombardy	North Brabant	Pays de la Loire	Pirkanmaa	Pomorskie	Sardinia	West Romania
Business support									
Business support to SMEs	*	*	*	*	*	*	*	*	*
Support to start-ups	*	*	*	*	*	*	*	*	*
Financial instruments	*	*	*	*			*	*	
Venture capital funds	*			*				*	
Business incubators, accelerators	*	*	*	*	*	*	*		*
Cluster initiatives	*	*	*	*	*	*	*	*	*
Internationalisation	*	*	*			*		*	*
Research and innovation									
Research, technology and innovation funding	*	*	*	*	*	*	*	*	*
Support to industry-science cooperation	*	*	*	*	*	*	*	*	*
Support to innovation platforms	*	*	*	*	*	*			
Public procurement of innovation/pre-commercial public procurement		*	*	*					
Skills development and labour market policies									
Support to vocational training	*	*	*					*	
Support to entrepreneurship training	*	*	*		*	*	*	*	
Support to unemployed								*	
Industrial infrastructure									
Industrial parks, special economic zones							*		*
Research and technology infrastructure for industry/technology parks	*	*	*	*	*	*		*	
Industrial site renewal						*	*		*
Regulatory actions	*		*					*	

Source: *Technopolis Group.*

The overall approach of the industrial policy mix in Baden-Württemberg is primarily characterised by a dominance of coordinating measures and improving structural conditions, rather than grants for specific projects. The direct support for SMEs mainly occurs through innovation vouchers and innovation consultancy. Moreover, there is a broad portfolio of financial instruments that are issued by three different regional business development banks.

The industrial policy mix of Pomorskie is composed of a range of direct and indirect measures implemented at regional and national level. During the 2007–2013 programming period, the policy measures in support of industrial development and innovation activities were somewhat horizontal instruments. During the 2014–2020 programming period, however, a greater focus is being placed on thematic measures concentrating the investments in areas with the highest innovation and development potential. In Pays de la Loire, the industrial policy mix combines large and transversal fiscal policies, as well as tailor-made support measures dedicated to industrial SMEs. The policy mix largely favours networking and collaborative activities as well as innovation. In terms of financial volumes, fiscal measures are way ahead of the other policy measures. As for the mix of instruments implemented, the trend observed (also at the national level) is to act indirectly rather than directly with businesses, with the objective of creating a favourable ecosystem.

In North Brabant, the main type of policy instrument used to implement economic policy objectives is support for industrial and innovation platforms created as a part of the Top Sectors policy.

The West Romanian policy mix is more horizontal, offering 'soft' instruments that are not available at national level (the latter is more focused on direct grants). In particular, the support for innovation management and entrepreneurship, and innovation competitions are valuable ways of developing the entrepreneurial and innovation ecosystem in the region.

In Lombardy, the industrial policy mix contains industry-specific as well as horizontal measures. This includes both direct and indirect support mechanisms combining, among others, grants, financial instruments, pre-commercial procurement, public procurement and platform-based projects.

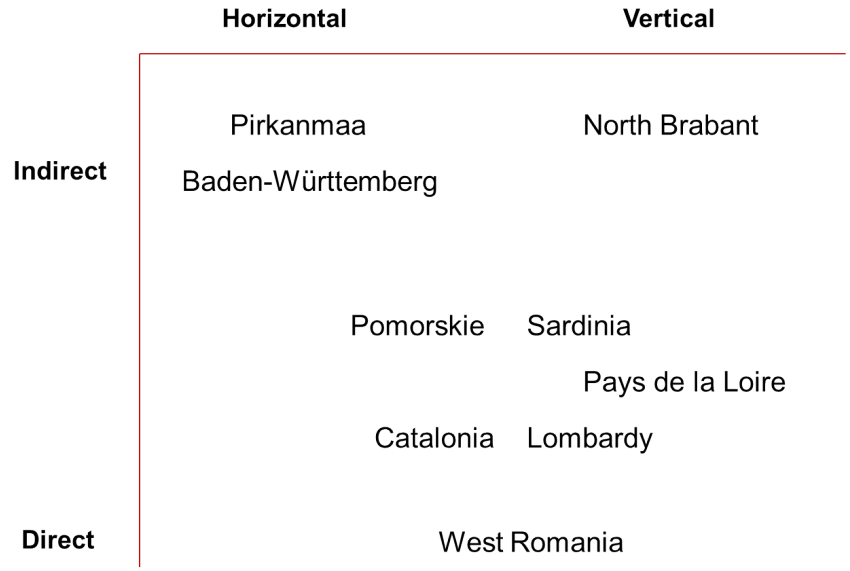
In Sardinia, the industrial policy mix is broad and comprehensive and centres around the enterprise, which is considered the main driver of regional economic growth. The enterprise is supported through both grants and loans which are usually meant to enhance a company's competitiveness. Moreover, significant resources are also spent on infrastructure, R&D, education and cluster creation.

In Catalonia, the policy mix comprises support measures dealing with business competitiveness, innovation and internationalisation. As of 2017, existing support measures (typically) do not prioritise different sectors of activity: prioritisation of industrial sectors is a relatively new feature of Catalan industrial policy introduced in 2015. Recent proposals that fall within the RIS3 identified sectors are considered more favourably.

In Pirkanmaa, there is no single industrial policy mix that is fully aligned but, instead, different actors at different levels aim at creating the right framework conditions and provide support services for businesses to grow and innovate. The main type of policy instrument to implement the economic policy objectives is the support to industrial and innovation platforms. This comes from the general policy goal to create an open and collaborative business environment on the basis of which industries can innovate, reinvent themselves and face global competition.

Figure 8 classifies the nine case study regions in terms of horizontal versus vertical, and direct versus indirect policy measures.

Figure 8: Main policy mix features



Source: *Technopolis Group.*

Yet, in spite of the use of a broad array of policy instruments, regions frequently highlighted the need to achieve 'a critical mass of support', in the sense of concentrating resources on a few key policy measures in order to generate meaningful and sustainable change. In Pirkanmaa, interviewed stakeholders mentioned that the implementation of regional or city strategies too often occurs in the form of separate isolated small projects that remain fragmented. This means that individual projects receive less funding than a comprehensive programme, which limits their potential to reach a critical mass of beneficiaries and to produce meaningful change and results. In Catalonia, in the opinion of most interviewees, programmes are currently underfunded and oversubscribed due to the small overall budget for industrial support. Policymakers may be under pressure to launch new support measures but they do not have a lot of room for manoeuvre in terms of resources. Several interviewees noted that it is very difficult to effect systemic change with small-scale interventions.

Hence there appears to be a strong trade-off in terms of the number of policy objectives being pursued, the number of instruments being used to pursue them, and the capacity to generate lasting and meaningful change under any of these objectives. In other words, the more policy mixes tend to fan out across a range of policy fields and policy instruments, the less likely it becomes that deep change will be generated across the board. This is the result of a zero-sum game which exists between the number and breadth of policy ambitions regions may have for industrial development, and the availability of financial resources to support their implementation. This is particularly true in contexts where financial resources are limited, and where financing of one additional policy instrument means reducing the financing of one or several others. Policymakers must be cautious of this trade-off between ensuring systemic change is being promoted by the use of a number of policy instruments across the entire ecosystem, and the capacity to generate sustainable change in any particular field.

There is no general rule of thumb in relation to the types of beneficiaries and target populations of existing industrial policy support schemes. Beneficiaries and target populations are generally identified on a case-by-case basis, depending on the type of policy instrument being considered. Generally, direct beneficiaries of industrial policy are companies including start-ups, SMEs and large companies. However, this also includes other types of stakeholders such as research organisations, incubators/accelerators, cluster organisations, higher education institutions, individuals (such as scholarship holders) and technology transfer organisations. In some cases, regions have made a clear choice not to support large companies. This is the case in Pirkanmaa where there is no direct support given to large companies; it is a general Finnish approach that there are no special tax breaks or any specific advantages provided to large multinationals.

Framework measures versus direct support to industry

Regional industrial policy mixes also tend to include policies and instruments which are either geared at improving the general framework conditions for industrial development, or targeted directly at providing support to industrial ecosystem stakeholders, such as companies or intermediaries. This is also supported by the small survey conducted among the participants of Eurofound's first RIPS; access to finance for companies, R&D and innovation, as well as education, training and skills developments are the topics most often covered in the respondents' contacts with other stakeholders related to the regional policy process.

The policy mix in Baden-Württemberg and Pirkanmaa is strongly focused on improving the framework conditions and supporting networking and collaboration. In other case study regions there are also framework measures to be highlighted.

The great majority of regions have dedicated resources and policies to enable collaboration across industrial actors and stakeholders, particularly by means of clusters and other forms of networking. This is, perhaps, the most frequently found element across all of the policy mixes.

Catalonia: The cluster support instrument offers some resources to develop both intra and intercluster initiatives, with about €1 million in projects. Cluster support used to be delivered through two programmes, covering strategy (development of new business opportunities) and the environment (collaborative projects and development of new cluster initiatives). As of 2017, only the second support instrument is active, since the first one was discontinued during the economic crisis.

Baden-Württemberg: Clusters and networks that provide infrastructure support to SMEs are systematically supported by the government. The clusters are closely linked to other innovation policy measures, such as business incubators and accelerators. Specific, service-orientated support for clusters is provided by the Cluster Agency, which in turn is supported by the Ministry of Economics.

Pomorskie: To strengthen the cluster support policy, the Regional Assembly adopted the Regional Cluster Support Programme for 2009–2015. The programme followed the recommendations developed under the project 'Stimulating innovations in the Pomorskie economy by supporting cluster development – policy concept and pilot measures' prepared by the Gdańsk Institute for Market Economics, 2005–2008. The key clusters were selected following a competition organised by the regional executive board. After the first competition in 2009, key cluster status was granted to two clusters, the Pomeranian ICT Cluster and the Baltic Eco-energy Cluster. After the second competition in 2010, status was granted to the Gdańsk Construction Cluster.

Lombardy: Due to the emphasis set by the RIS3 on clustering, collaboration and technology specialisation, as well as on the importance of 'the technology-district' based industrial policy approach in the region, support for clusters represents one of the fundamental pillars of the regional industrial policy mix. In order to support

and accelerate a growth process of clusters, the regional administration offers direct support to complementary activities aimed at reinforcing networking among actors working on selected thematic areas, and to develop both intra and intercluster initiatives.

Sardinia: Two main types of cluster policies can be mentioned: bottom-up clusters in joint research projects promoted by local companies and supported by research centres and universities; and top-down clusters in research projects promoted by research centres and universities which local companies join later.

Pays de la Loire: The French central government and French regions have, for the past two decades, provided support for competitiveness clusters, mainly in the form of financial support for cluster governance structures. Prominent clusters include EMC2, Atlanpôle Biotherapie and Images et Réseaux study regions, in addition to other traditional types of support schemes such as innovation vouchers.

An emerging trend in the support of framework conditions appears to be the use of policy instruments aimed at developing other forms of networks and communities in support of industrial development. These forms of collaboration tend to be broader than clusters and are not always anchored to one specific sector or market. Examples of this include the ACCIÓ grants for RIS3 communities, which are part of the RIS3CAT Catalan smart specialisation strategy; RIS3CAT communities have been created as voluntary associations of companies and stakeholders in the Catalan innovation system. These communities are an essential and innovative element of RIS3CAT. As active stakeholders in the Catalan innovation ecosystem, they ensure the participation of companies and stakeholders from the system in defining, monitoring and evaluating the priorities for R&I programmes. Their multidisciplinary profile and bottom-up focus make them leading players in the EDPs that lead to increasing specialisation, as they identify and generate projects related to specific topics in the leading sectors.

In Pirkanmaa, at regional and local level, the main type of policy instrument used to implement economic policy objectives is the support for industrial and innovation platforms. This comes from the general policy goal of creating an open and collaborative business environment, on the basis of which industries can innovate, reinvent themselves and face global competition. This is also in line with the recent policy shift towards a 'platform-based' policy approach. Contrary to traditional cluster policies, where the focus was put on cooperation between companies and research organisations, and on fostering R&I projects, the platform approach stresses the importance of communities, talent and global ecosystems. In North Brabant, at regional and local level, the main type of policy instrument used to implement the economic policy objectives is the support for industrial and innovation platforms created as a part of the national Top Sectors policy. Lombardy's support to clusters is also evolving in this direction, illustrated by the changes introduced to the region's cluster support policy. It has gone from a traditional sector and geographically-based approach, to a more open and innovation-based approach, geared at creating the right enabling conditions for cross-sectoral collaboration, aimed at addressing particular social, environmental and technological challenges.

There is also a trend towards co-working and collaborative working spaces, especially linking tech entrepreneurs and start-ups, which has been developing in line with European and global trends since 2013. This is particularly visible in the city of Timisoara (West Romania), where there are at least three co-working spaces and a makerspace (at PlanZero), a place in which people with shared interests, especially in computing or technology, can gather to work on projects while sharing ideas, equipment and knowledge. The rest of the cities in the region have not yet been involved in activities of this kind.

A good example is StartupHub Timisoara – a co-working space – developed as a central point for the IT tech entrepreneurs in the Timisoara City Business Centre, and funded by Timisoara City Hall to offer facilities for establishing businesses. The StartupHub has become an important node in spreading information, facilitating networking events, mentoring and inviting international speakers to give advice on specific business or technology issues. The hub hosts meetings of several of the IT communities (for example, the Timisoara Mobile Development Group meetup). In 2016, they also initiated regular meetings on the theme of automotive technologies, diversifying their sectoral reach. The StartupHub is facilitated by local established entrepreneurs.

Direct versus indirect forms of financial support

Access to financing is often cited as one of the major barriers to business growth and innovation in Europe, at both regional and national levels. Unsurprisingly, the provision of financial support to different stakeholders along the innovation chain features consistently at the heart of innovation policy mixes. Every region provides some type of direct support mechanism, such as matching grants, or other types of support instruments such as innovation vouchers. However, there appears to be a trend towards the use of investment and loan guarantee funds. In Baden-Württemberg, there is an emphasis on debt financing regarding middle and higher lending volumes. The lending volume per establishment is much higher than in other federal states.

In addition to the set of 'traditional' policy instruments which make up the regional policy mix, Lombardy has also made intensive use of two particular instruments: financial engineering instruments in support of innovation; and public procurement in support of innovation. Over the years, Lombardy has developed a large portfolio of complementary financial instruments (debt and equity financing) in order to support company creation and growth, and the transformation of the manufacturing sector. The underlying rationale for this type of intervention was mainly linked to:

- existing financial market gaps, evidenced by the *ex-ante* evaluation of the regional financial ecosystem;
- lack of access to finance, particularly for the most innovative SMEs at both an early stage (seed funding) and in the development stage;

- greater efficiency of the financial instruments (compared to grant schemes) for the regional public budget by providing revolving funds and being invested on commercial terms.

Traditionally, most financial instruments have been linked to the use of ERDF. For instance, during the 2007–2013 programming period Lombardy implemented:

- two instruments (SEED and NEXT funds) focusing their intervention to support emerging innovative businesses at a total cost of €47.7 million;
- five instruments (JEREMIE-ERDF Fund, FRIM-ERDF Fund, Made in Lombardy Fund, MIUR EOI and call for tenders) supporting industrial and experimental support research for a total cost of €706 million.

As illustrated by the Lombardy case, the use of financial instruments is, in some cases, intricately linked to ESIF. In Pomorskie, financial instruments are regarded as special policy tools that are expected to be used more widely in the future. The Regional Assembly is committed to the establishment of a Fund of Funds, an investment strategy of holding a portfolio of other investment funds rather than investing directly in stocks, bonds or other securities. The Pomeranian Regional Loan Guarantee Fund provides support to SMEs by making it easier for them to gain access to debt financing and granting guarantees for incurring loans and credit facilities. Another financial instrument is the Pomeranian Loan Fund which provides loans with low (subsidised) interest rates to SMEs following simplified procedures. Financial engineering instruments are also well-developed in Sardinia, where they have been used to support microcredit and venture capital schemes. These instruments have become particularly important in light of the serious budget constraints caused by the economic crisis.

The level of use and uptake of such instruments among case study regions seems to vary considerably.

Internationalisation

An additional prominent feature of industrial policy mixes is the use of instruments in support of internationalisation of the regional industry. This generally translates into initiatives seeking to attract FDI into the region, or providing support for regional companies to expand their activities in foreign markets. The policy measures in the nine case study regions support different activities. While, in some regions, direct support is provided to export promotion as in Catalonia, Lombardy, Pomorskie and Sardinia, in others the emphasis is on increasing companies' skills to trade internationally and on providing consultancy services (Baden-Württemberg and Pirkanmaa).

In Pomorskie, key initiatives on investment promotion include the Export Broker and the Invest in Pomerania initiatives. The Export Broker programme aims at establishing a comprehensive system of export promotion, while the Invest in Pomerania initiative is a service to investors that is offered through the Pomeranian Development Agency. As part of Invest in Pomerania, numerous companies representing the ICT, renewable energy and eco-technology sectors have taken part in trade missions to Denmark, Finland, Germany, Norway and Sweden. In West Romania, there is further support for investment promotion that includes incentives such as exemptions from property tax and transportation fees for investors creating new jobs.

In Baden-Württemberg, policy measures regarding internationalisation are mainly fostered and implemented by BW-i (Baden-Württemberg International) which is the region's foreign trade promotion agency. Direct services offered by the agency include individual support, business journeys and roadshows, which are directed to companies, clusters and research institutions. Consultancy on exporting is delivered by the Rationalisation and Innovation Centre of the German Industry (RKW).

In Pays de la Loire, policymakers have shown a growing interest in the internationalisation of regional enterprises within industrial policy. As of 2016, 11 support measures are organised in a 'pack export pathway'. The pathway measures are dedicated primarily to SMEs in specific industry sectors (such as maritime industries, advanced manufacturing, digital and electronics) but also to larger companies provided they fall into strategic regional sectors. The measures support SMEs that need financial resources for communication and marketing material, for participation in international fairs, and hiring special staff for missions abroad. In addition to this, the region has adopted an Innovation and Internationalisation Development Strategy for 2017–2022 (SRDEII).

In Lombardy, the attraction of FDI is one of the main policy priorities, according to the Strategic Document for Industrial Policies, 2013–2018. In addition to promoting the 'Made in Lombardy' brand in emerging and high-growth markets, the strategy seeks to attract foreign investments and supports the development of productive and scientific partnerships with foreign players in the areas of regional specialisation.

This is also the case for Sardinia, where the policy field regarding 'inwards investment' has been given particular importance, since its enterprise system does not have a lot of capital for new investments; and also because the regional S3 relies heavily on the expectation that the presence of research infrastructure and expertise will attract FDI. Low exports are one of the main weaknesses of Sardinia's economy. For this reason, the Department of Industry has been entrusted by the regional government to implement specific policies, including financial support and training, to increase the exports of regional companies.

In Pirkanmaa, manufacturing companies get advice and support for business development, first of all from the Pirkanmaa ELY Centre (Centre for Economic Development, Transport and the Environment). Services include support for growth, renewal and internationalisation, and the centre performs business infrastructure and business internationalisation analysis. Technology experts assist regional enterprises in their domestic and international projects.

Support to skills and education

Education and training are traditionally seen as one of the key pillars of industry, and their quality is therefore considered as crucial for the success of this sector in several of the case study regions. However, as illustrated in Chapter 3, the inclusion of education and training within industrial policy is far from systematic. There does not appear to be any straightforward explanation for the presence (or absence) of education and training in the regional industrial policy mix, other than institutional set up (the existence, for example, of separate departments within regional authorities dealing with each of the two policy domains) or tradition. Education is perhaps often excluded from the industrial policy mix given the traditional divide between research and the education and training functions of higher education institutions, as well as the historical divide between the private sector and academic and research organisations. As such, several of the industrial policy mixes still fail to take into account measures aimed at enhancing human capital in light of broader industrial development objectives. Based on the level of importance attributed to skills development, training and education in the policy mix, case study regions can be broadly categorised into three main groups.

Skills, education and training are a key component of the industrial policy mix: This includes regions such as Baden-Württemberg and Pirkanmaa, where skills, training and education measures are explicitly considered to be part of the industrial policy mix. In Baden-Württemberg, as in the rest of Germany, vocational education and training is seen as one of the key pillars of industry and its quality is therefore considered as crucial for the success of this sector. Hence, in Baden-Württemberg, 'skilled workers' policies' are treated as 'industrial policies' and are therefore strongly considered in the budgetary allocations made to this policy domain. In addition to the support for education and training infrastructure, marketing campaigns are conducted to attract more apprentices. Moreover, there are several measures that aim to support professional development against the background of industrial change.

Skills, education and training are partially addressed, mainly from an R&I standpoint: This is the case for Catalonia, where the area of education is mostly absent from the industrial policy mix. However, the region is supporting some forms of human resource development, particularly in the fields of science and research such as grants for doctoral studies. This is also the case in Pays de la Loire where human resource development is mainly addressed by means of industrial doctorates support schemes through, for example, the Industrial Agreement of Training through Research (CIFRE), or direct support for companies to host young researchers. Sardinia has only limited powers over education, which falls within the remit of the national government. Nevertheless, it has made important investments for reinforcing the national policies, in particular by financing new school buildings, delivering programmes to combat school dropout rates, allocating scholarships, and supporting student mobility.

Skills, education and training are absent from the policy mix: This is the case for Lombardy where, until very recently, education and training were mostly absent from the regional policy mix.

Measures supporting advanced manufacturing

In general, the level of interest in advanced manufacturing technologies has undergone a sharp increase, particularly due to the rise of the Industry 4.0 paradigm, and its increased recognition in the policy landscape. Support for advanced manufacturing is being rolled out in the majority of case study regions. The regional case studies illustrate a number of differences as well as similarities in the approaches used to support the development of advanced manufacturing. The analysis supports many of the key findings presented in the framework of the European Commission's Regional Innovation Monitor Plus (RIM Plus) thematic paper on supporting advanced manufacturing activities at the regional level.

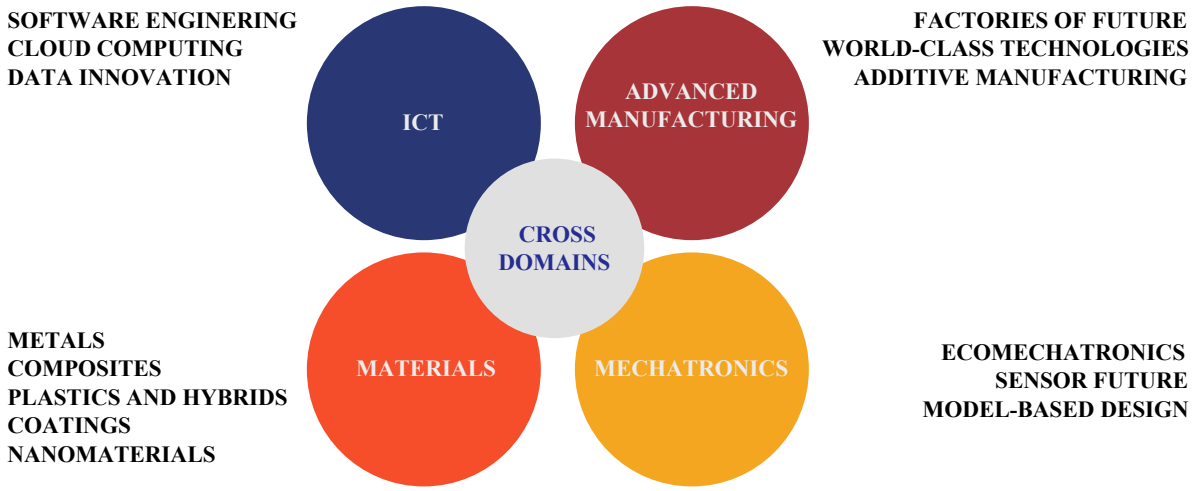
> *Advances in science and technology, usually occurring as a consequence of academic and industrial research are the main driver of advanced manufacturing. In its purely technological sense, advanced manufacturing encompasses the use of science, engineering, and information technologies to improve existing or create new materials, products and processes.*
>
> Technopolis Group (2014a)

Originally, the term advanced manufacturing was mostly used to refer to the pre-commercial R&D domain of KETs. However, the term is currently used to refer to the broader innovation domain.

One of the main characteristics of KETs or 'multipurpose-technologies' is that they can be applied in many products and processes of many sectors, companies and regions. However, not every sector, region or company has to excel in developing its own new KET. As such, identifying priorities in terms of the research domains that require support to develop new KETs is a research policy domain for which the EU and national level of governance is more appropriate than the regional level. However, given that the application of these technologies takes place in the broader innovation and industrial policy domain, the regional level of governance is also very relevant.

The analysis of regional initiatives in support of advanced manufacturing shows that the most relevant KETs for advanced manufacturing are ICT, materials and mechatronics (Figure 9).

Figure 9: Relevant KETs for advanced manufacturing



Source: *Technopolis Group (2014b).*

There appear to be four priority areas for regional policy interventions in support of advanced manufacturing:

- resource efficiency and sustainability;
- materials for advanced manufacturing processes;
- industrial automation systems, robotics and manufacturing equipment;
- initiatives with a broader focus targeted at upgrading innovation capacity and competitiveness of industry.

As illustrated by previous sections, many regional industrial development and innovation strategies have included advanced manufacturing as a priority policy domain, either as a vertical (sector-specific) or horizontal priority domain. However, there are also regions in which advanced manufacturing is still seen as a relatively new policy concept, and thus has not been completely integrated into broader industrial and innovation development strategies. In general terms, given that the case study regions (with the exception of Sardinia) have a strong manufacturing sector, they generally have a highly pronounced strategic interest in promoting advanced manufacturing.

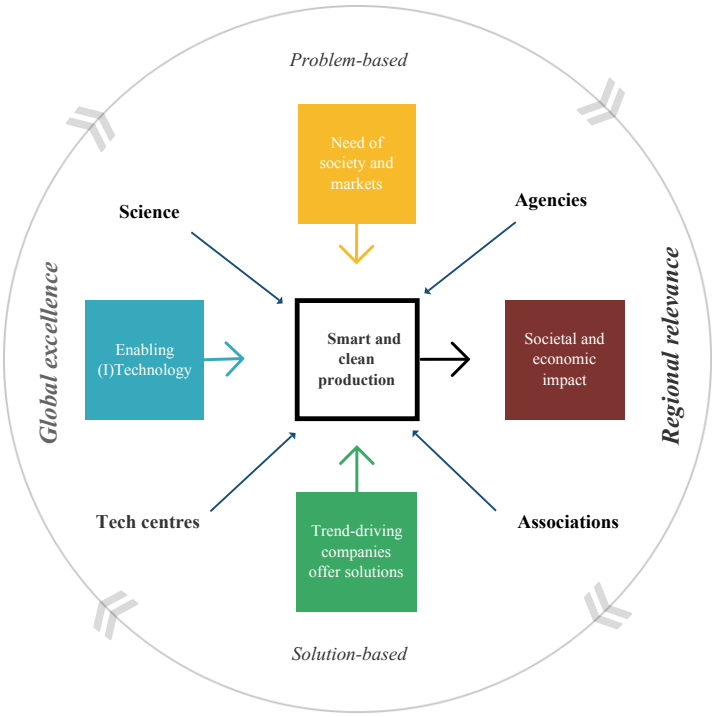
There are multiple types of stakeholders providing services and support on advanced manufacturing at regional level (Figure 10). One group is of organisations that host relevant infrastructures, such as labs, pilot plants, demonstration and testing facilities, and which are often also 'centres of excellence' where there is cooperation in pre-competitive R&D involving public and business researchers. These centres are often hosted by universities and public research labs. Examples include the ARENA2036 research centre and the Graduate School for Advanced Manufacturing Engineering hosted by the University of Stuttgart (Baden-Württemberg), the demonstration plant for additive manufacturing hosted by the Barcelona UPC-CIM (Catalonia), the mechatronics demanufacturing pilot plant hosted by CNR-ITIA (Lombardy), and the BioMediTech research and clean room facilities hosted by FinnMedi/Kauppi Campus (Tampere).[21]

Sometimes these centres of excellence are networked with others, either in a regional or national setting, as is the case with the high-technology networks of labs in Italian regions. A second group of regional organisations involved in services and support for advanced manufacturing are associations and cluster organisations. These organisations are mostly sector-specific and may have led to sector-specific technology centres – a third type of actor (based on their collective needs). Compared to centres of excellence, they are less orientated to basic research excellence, but more to developing applied solutions that are relevant for their regional 'members'. In this respect, they are more orientated to the global supply and regional demand side.

A fourth group of actors involved in providing services and support for advanced manufacturing are innovation agencies. Their approach is often the most demand-orientated and their support and services are often the broadest. They also have a more horizontal scope, although the sector-specific choices made in regional programmes are often also visible in sector-specific activities of regional agencies. Their initiatives often start with identifying what manufacturing companies in the region need, and subsequently link these needs to experts that can provide solutions.

21 www.biomeditech.fi

Figure 10: Actors involved in regional policy promoting advanced and clean manufacturing



Source: *Technopolis Group (2014c), based on Business Innovation Observatory Trend Report (Avigdor et al, 2014).*

The tools and policy initiatives implemented by these stakeholders in their efforts to support the development and uptake of advanced manufacturing are very diverse. There tends to be a strong overlap between the advanced manufacturing policy mix and the traditional innovation and industrial development policy implemented at the regional level (see Chapter 6). These can generally be described as traditional innovation and industrial development support tools, which are given a specific spin to advanced manufacturing. These include: the development of infrastructure to develop, test and demonstrate production processes; skills development; support for research targeted at process innovation in regional factories; and other forms of financial support, such as grants and loans. At regional level, support for advanced manufacturing tends to come as a package of different services and different kinds of support, as well as different instruments to deliver this support. The tools include, for example:

- providing advice, information and network events;
- promoting contracted research and service provision by technology institutes;
- improving the quality of service provision;
- providing and sharing infrastructure for testing and demonstrating;
- vouchers for solving problems raised by companies;
- subsidies for innovation projects, which include process innovation and organisational innovation;
- promoting collaborative R&I;
- multidisciplinary teams with students and fast prototyping of solutions to business needs;
- innovation assistants – subsidised hiring of a person to run an innovation project;
- providing training;
- developing apps to catalogue infrastructures and to promote the use of equipment in labs.

The choice of instruments deployed in support of advanced manufacturing varies according to the regional context. There are many policy challenges and policy options to advancing manufacturing, but the specific challenges and options differ between regions. For some regions the issue of skills is more pressing than in others. Also, the general level of advancement and differences in, for instance, labour costs, require the regions to design a policy mix that best fits a region's specific needs and assets. The following paragraphs present some of the flagship initiatives rolled out by case study regions as part of their policy mixes in support of advanced manufacturing.

Baden-Württemberg: Measures specifically addressing advanced manufacturing generally arise from the framework of Industry 4.0 and hence the digitalisation of the value chain. The main activities encompass the establishment of the network Allianz Industrie 4.0; the working groups of this initiate specific projects and conferences. For the first two years, the ministry provides at least €8.5 million for Industry 4.0 projects, which can increase up to €14.5 million. Around €5 million is being provided from regional government resources to finance the setting up of the network and its first projects. Industry is also contributing around €5 million.

Examples for projects/measures already initiated in the framework of Allianz Industrie 4.0 are:

- **100 locations for Industry 4.0**: Baden-Württemberg is launching a competition to award companies with innovative solutions for the digitisation of the value chain in industry. The competition is primarily aimed at companies that operate as suppliers and users of innovative solutions. SMEs are being particularly encouraged to submit their ideas.
- **Consulting and advising SMEs towards Industry 4.0**: This covers information on the implementation of Industry 4.0 projects; an initial consultation (for instance, through workshops) on how to integrate Industry 4.0 in the value chain; research and selection of innovation partners; and project planning and project support.

Catalonia: The agency ACCIÓ monitors an increasing core of medium and large companies with a growing interest and usage of advanced manufacturing techniques. These are often part of cluster initiatives, comprise the main users of services offered by the Catalan Technology Centres, and are also the main actors engaging with the different activities of agenda setting in the area of advanced manufacturing, promoted by ACCIÓ and departments of the Catalan government.

The uptake of advanced manufacturing is also promoted through newer initiatives that focus on the concept of Industry 4.0. The actions to boost Industry 4.0 in Catalonia fall under the umbrella of the 2016 National Pact for Industry and the 2014 SMARTCat strategy, developed by the Catalan government. These are presented as opportunities for internal growth as well as ways of attracting new foreign investment. There are five action lines aimed to generate a climate of opportunity to boost the uptake of advanced manufacturing activities. They are:

- support the growth of R&D;
- innovation industry-focused investment projects for Industry 4.0, with a budget of €406 million from ESIF 2014–2020;
- the establishment of an Industry 4.0 cluster initiative;
- the promotion of international fairs and congresses held in Barcelona that have an impact on smart technologies and the digital transformation of the industry, such as the Mobile World Congress, the IoT Solutions World Congress and the Smart City Expo or In(3D)ustry;
- the implementation of strategic projects to develop infrastructure that can facilitate rapid dissemination of Industry 4.0 across the business community, the first of which is the Industrial Ring 4.0, which seeks to accelerate the convergence between industrial and ICT sectors.

There have been initiatives to drive the uptake of advanced manufacturing across Catalan industry for several years. In 2011, the Connect-EU group Factories of the Future drafted a Catalan Strategic Agenda to influence and boost participation in the Seventh Framework Programme in the area of advanced manufacturing in the region. In 2017, this work has been picked up by the RIS3 community on advanced manufacturing, which defines the main challenges in Catalan manufacturing in terms of increasing industrial competence in the following areas:

- efficient and sustainable manufacturing;
- ICT in industrial environments;
- processing of new materials;
- additive manufacturing.

North Brabant: The region's role in manufacturing can be felt by its participation in various programmes driven by the Top Sectors policy. One such initiative is the Brainport Industries Campus Innovation Programme. This project looks to jointly develop state-of-the-art technological product and process innovations in robotics, mechatronics, 3D printing, and embedded electronics and software – essentially, everything around the 'smart factory'. This physical space provides a place to share facilities, conduct joint experiments and trial production runs in the 'Factory of the Future'. Some of the shared facilities include: 3D printing machines; measurement systems; fibre-optic internet; server rooms; stock control; logistics; and quality control and waste processing. The site includes 5 (planned) factory buildings covering 65 hectares.

Pays de la Loire: Regional Innovation Platforms (PRIs) play an essential role in the diffusion of R&D results to local industries. PRIs emerged in 2009 as a way of meeting the needs of companies through specialised and agile regional collaboration networks. In Industry 4.0, the PRI Proxinnov platform plays a central role. Inaugurated in 2013 in La Roche-sur-Yon, Proxinnov is dedicated to industrial robotics. Capitalising on the experience and expertise of regional leaders in the field (notably the Sepro Group which is a leading independent manufacturer of Cartesian robots for injection moulding machines), the platform's mission is to increase awareness among regional companies of the opportunities offered by robotics, and to support the introduction of robotics in their production processes. To that purpose, it supports the whole robotisation process, from diagnosing needs and R&D, to industrialisation and commercialisation. The platform also performs feasibility studies and trains personnel in the adoption of robotics – its demonstration facilities now include four industrial robots and one humanoid.

There are seven PRIs directly involved in advanced manufacturing activities including: PRI Clarté (virtual reality); design' in Pays de la Loire (integrating design thinking in industrial projects); PRI Cisna 2.0 (virtual reality, fast prototyping); PRI Atrium (connected objects); PRI CEMCAT (research centre for advanced composite materials for transport); PRI Orace (energy consumption in industrial processes); and PRI Primabor (agricultural machinery).

Financial support for these kinds of projects in the region is guided by mutual cooperation contracts signed with PRIs based on three-year strategic plans. This support can take various forms, from investing in property, to buying equipment, or funding human resources.

West Romania: The Regional Competence Centre for Supplier Development in the Automotive Sector project was developed as an initiative of the automotive cluster. The centre is located in the West Region, Timisoara,

Freidorf Industrial Park. Timisoara City Hall, the applicant for the project, worked closely with the automotive cluster to ensure good quality management of the centre. The main objective of the project is to create a business infrastructure that will support the implementation of a package of services and training programmes for enterprises in the sector. Its aim is to increase the number of skills in the mechanical, engineering and automotive sectors in the region. This will lead to sustainable support of the development of the urban 'growth pole' in Timisoara by increasing the investment attractiveness of the area.

ESIF

ESIF (particularly the ERDF) tend to play a major role in the financing and implementation of regional industrial policy. This is partly explained by the close ties between regional smart specialisation strategies, regional industrial policies and ERDF operational programmes. Here again there appear to be three models of regions based on the importance of the industrial policy's reliance on European funds:

- **heavy reliance** – Lombardy, Pomorskie, Sardinia and West Romania;
- **medium reliance** – Catalonia, North Brabant and Pays de la Loire;
- **limited reliance** – Baden-Württemberg and Pirkanmaa.

The level of reliance on European funding is often determined by:

- the volume of funding allocated to the region based on ESIF eligibility criteria;
- the level of funding allocated to industrial policy by other funding bodies (such as regional or central government, or the private sector).

The analysis does not reveal any additional commonalities among regions belonging to any of these categories in terms of socioeconomic characteristics, policy objectives and policy mixes.

Regions have tapped into ESIF in order to support the implementation of their industrial policy agendas, ensuring consistency across ESIF-funded and non ESIF-funded policy initiatives, within their policy mixes. This is illustrated by the close ties which exist between ERDF priorities and actions, and regional 'mainstream' industrial policy mixes and agendas, as well as by the fact that all regions have complied with the prerequisite of adopting an S3 in order to receive ERDF funding.

While the ESIF are generally viewed by regional stakeholders as a key asset for the implementation of regional industrial policy agendas, in West Romania some interviewees mentioned the presence of adverse incentives linked to the current system of structural funds. In this region, ESIF are sometimes perceived to produce counterproductive effects from local authorities, who, due to budgetary difficulties, prefer not to use their own funds to develop strategic projects, but wait for the funding cycles of the EU structural funds. Since it is often hard to match the local needs with national level priorities, some of the strategic projects for regions have not been selected for funding in national level competitions (Roman, 2014).

However, regions have also implemented actions aimed at increasing their capacity to collect competitive-based financing, particularly in research, development and innovation. Baden-Württemberg was ahead of the other German federal states in acquiring European research funding. Between 2007 and 2013, it received around €1.39 billion from the EU's Seventh Framework Programme (FP7); a total of 143 scientists from Baden-Württemberg were awarded with research fellowships from the European Research Council. Moreover, several institutions have leading roles in European flagship projects such as KIC InnoEnergy and the FET Flagship Initiative Human Brain Project. To guarantee that universities participate in European projects in the future, the Ministry of Science is supporting their applications and participation in Horizon2020 projects with initial funding. Moreover, every university in Baden-Württemberg is appointing a funded EU officer to provide support and counselling in developing EU research projects (Ministry of Science, Research and the Arts of Baden-Württemberg, 2016).

In Italy, €766.9 million in FP7 funding went to industrial processes and plants (IPP) between 2007 and 2013 (Table 10).

Table 10: Total value of FP7 funding by key research areas (€ million), 2007– 2013

	ITC4 (Lombardy)	IPP (Italy)	TOTAL FP7*
Adaptive, smart, zero-defect manufacturing solutions	35.0	174.0	1,428.3
Digital factories	48.4	119.4	893.8
High-performance manufacturing	140.5	403.7	6,353.5
Sustainable, green manufacturing	19.1	59.1	645.1
Other projects	2.9	10.7	112.7
Total	**245.9**	**766.9**	**9,433.4**

Note: * *Applied research projects.*
Source: *Ismeri Europa – RED database on FP7. Data presented in RIM, 2016.*

Policy implementation process

The practical modalities for the implementation of the instruments included in regional industrial policy mixes (see Chapter 4) vary significantly. This is partly due to the strong diversity of instruments being used, which each tend to have their own implementation and management procedures. The strong diversity of policy instruments covered by regional industrial policy mixes makes it very difficult to develop a typology of delivery mechanisms, as well as a comparative analysis of the different steps involved in selection processes and the respective time frames.

However, a large majority of instruments are being implemented through bottom-up and merit-based procedures such as calls for proposals (open or closed), and funding for specific projects. In addition, the types of agents responsible for the implementation of these instruments vary across regions, as well as according to the type of instrument. In some cases, policies are implemented directly by regional authorities while, in other cases, they are delegated to implementing agencies. The analysis of the case studies does not provide any clear rationale of why regions decide certain delivery mechanisms, why some channels are more appropriate than others, or whether these mechanisms are more often used – given the existence of a particular context or policy consideration. The reasons leading to the choice of delivery mechanism appear to be as broad as the types of policy instruments included in regional industrial policy mixes themselves.

The case studies, however, shed light on an element which is commonly acknowledged as a key determinant of policy implementation success: a clear communication strategy in terms of how policy support works; under what conditions potential beneficiaries might access support; and the general 'rules of the game' in participating in industrial support policies. The majority of study regions have clearly invested in initiatives aimed at improving the level of visibility of their support instruments, reaching out to target populations, as well as the level of understanding of how they work and what they aim to achieve.

Funding and policy delivery mechanisms: periodical calls for proposals or open submission of applications

As previously mentioned, the most recurrent forms of policy implementation are competitive calls for proposals providing funding for specific projects. Calls for proposals can be open or closed based on whether one can submit proposals continuously during the lifespan of the programme, or during specific periods. In Pirkanmaa, the implementation of the policy mix in support of industrial development relies primarily on project funding via open calls. There are also specific thematic calls, especially in cases with collaborative efforts between regions. In Pomorskie, a number of policy measures are implemented through open calls for proposals (for example the regional cluster programme). However, given that the main source of funding in Pomorskie is the EU Structural and Investment Funds, the implementation procedure follows EU and national regulations. It is interesting to note that regional authorities make use of external experts, when required, in order to assess and examine applications for funding. The evaluation of proposals takes place in four phases, which usually takes a couple of months.

In Sardinia, while periodic calls for proposals used to represent the mainstream implementation procedure, open calls have become increasingly popular. This is especially due to the need to reduce red tape. In fact, open calls are usually simpler (from the viewpoint of the applicant) and faster.

In Catalonia, ACCIÓ support measures are implemented as a mix of open calls for proposals and ad hoc support. As of 2017, most of the programmes are implemented as open calls. However, some regional stakeholders pointed out the need to further refine targeting strategies in order to increase the participation of the intended types of beneficiaries, which would imply a shift from open call to direct support actions to targeted beneficiaries. As a result, ACCIÓ is building internal information sources (see section on policy intelligence in Chapter 3) that would allow them to carry out specific support activities requiring very good and granular information on the industrial base. For example, in the area of internationalisation and FDI, instead of publishing an open call, specific new opportunities could be identified and supported on a bespoke basis.

Need for technical know-how in the implementation process

The quality of the implementation process is also strongly influenced by the capacity of the implementing agent or agency (for example, in terms of technical know-how and availability of human resources). In the case study regions, there are a number of examples of dedicated implementation agencies, which are disassociated from decision-making or administrative branches of government (see Chapter 3). These agencies tend to have strong expertise in the operational implementation of policy instruments. In Baden-Württemberg, measures relating to qualification, consultancy and contests are processed and selected by ifex (initiative for business start-up and company succession), an independent unit in the Ministry of Economics which is a project and support agency, information hub and provider of ideas. However, ifex has less autonomy than state agencies as all its tasks are mainly linked to the administration and implementation of policy measures. Innovation vouchers are one measure which is administrated by ifex. Whether applications for these vouchers fulfil eligible criteria is decided by an Innovation Council, consisting of seven external experts. In Baden-Württemberg, the major financial instruments based on debt capital (such as start-up or growth financing) are, in most of the cases, processed and implemented by L-Bank, the state development bank.

In Lombardy, the capacity of the region to implement its policies is enhanced by the existence of a strong and agile agency, Finlombarda. Finlombarda is an implementing agency responsible for managing regional economic development programmes, especially financial

instruments providing debt financing or equity financing to companies. The agency is also in charge of the operational implementation of the specific objectives of the ERDF 2014–2020 targeting SME creation and growth.

Clear communication, visibility of programmes and transparency of procedures

In addition to clear and relevant selection and financing criteria, a key element in implementing industrial development policies is tied to the communication and visibility they are given. This relates to the capacity of policy practitioners to clearly communicate the existence of support mechanisms, as well as the basic rules to be followed in order to benefit or participate. The case studies provide multiple examples of how regions are proactively engaging clear and strong communication activities around their industrial policy mix. This also reflects the fact that specific resources are being allocated to the information and communication dimension of policy initiatives.

In Baden-Württemberg, the mechanisms that exist in order to inform regional stakeholders vary and depend on the policy measure, as well as on the specific target group. For all programmes, there is a detailed overview with contacts given for people and institutions which allows for a comparison of programmes available (in terms of types of beneficiaries and types of support provided) in order to facilitate the selection of the most appropriate instrument. ifex explicitly states that its way of communication can be called support-marketing because it developed certain customised strategies to approach potential beneficiaries. However, for its implementation, the ministry depends on the support of subregional actors such as chambers of commerce or local economic associations. There are several elements to support marketing.

Facilitation and digitalisation: The Ministry of Finance and Economic Affairs is planning to digitalise the whole application procedure to facilitate the access to documents and streamline the process; access to its support database has already been improved for mobile devices. Events are kept simple – not too many different instruments are presented at one event.

Awareness-raising events – visit the locals: Representatives of the ministry are organising awareness-raising events in small remote communities after realising that some entrepreneurs who live in them are often too involved in their daily work to spend any time travelling to larger and more central towns. Hence, events with up to 100 participants are often organised in towns that have fewer than 10,000 inhabitants in order to reach medium-sized companies. The increase in applications (directly after such events) is seen as a success of client-specific marketing.

Target group specific marketing: For start-ups, in particular, the ministry tackles two specific groups: women and migrants. For example, it is organising events in Turkish and has launched a specific campaign which should help to address the needs of people with a migrant background.[22]

Pays de la Loire region has created a single entry point for information on innovation support measures – the Regional Innovation Development Network. This is facilitated by one agent from the regional agency, and has developed a dedicated website[23] which aims at being educational, comprehensive and informative. In Lombardy, Finlombarda conducts regular events not only to inform companies and other innovation stakeholders about their own support measures, but also to guide and encourage them to participate in national and European programmes. Additionally, all the information is available online, together with a knowledge base containing hundreds of company case studies, innovation guidelines, and studies identifying business opportunities abroad.

International cooperation

All case study regions are involved in European projects and initiatives as part of their work in industrial development. However, while some regions appear to participate in these initiatives on a case–by-case basis, others seem clearly to be using international cooperation to drive their industrial policy at home. In these cases, international cooperation not only provides momentum for the implementation of the industrial policy agenda, but also represents a source of knowledge and inspiration which, in turn, strengthens the capacities of local policymakers and practitioners. However, it is difficult to assess the reasons that lead some regions to be more pro-active in the international scene compared to others on industrial policy. In addition, international cooperation in industrial development (not to be confused with internationalisation as presented in Chapter 4) is not generally identified as a policy priority or objective in policy documents. As a result of this, it is difficult to draw any type of empirical assumption on how regions build international cooperation into their industrial development policy priorities locally. The propensity and willingness to engage in international cooperation appears to stem mainly from the political will of elected representatives. The perceived benefits are mostly described as ‘policy intangibles’ (international exposure for the region, for example) which are seldom translated into a specific result or outcome indicators at regional level.

This is the case of Lombardy and Pirkanmaa where interviewees highlighted that they regard international partnerships as essential, as no region can expect to excel by itself. The regional council, the city of Tampere and the other municipalities participate in a range of EU-funded and other international projects. The CEO of the Regional Council is, for instance, a member of the European Network of Regions for Research and Innovation, which is supporting regional networking in the area. In addition, the need to be connected to European networks and to be better positioned to access European and international funding stimulates actors to be active at an international scale. The key regional and local actors are involved in extraregional cooperation through various channels such as the Interreg programmes (the Baltic Sea Region cooperation programme for example), the Vanguard

22 http://www.frag-dimitri.de
23 http://www.territoires-innovation.paysdelaloire.fr/

Initiative for New Growth through Smart Specialisation, and other international platforms such as Demola.

The Vanguard Initiative for New Growth through Smart Specialisation, launched in 2013, is driven by a political commitment made by the EU to use its smart specialisation strategy in order to boost new growth through bottom-up entrepreneurial innovation and industrial renewal in European priority areas. The initiative seeks to lead by example; developing interregional cooperation and multilevel governance for supporting clusters and regional ecosystems to focus on smart specialisations in priority areas for transforming and emerging industries. Vanguard regions look to build the synergies and complementarities to boost world-class clusters and cluster networks, in particular through pilots and large-scale demonstrators. These investments are expected to strengthen Europe's competitive capacity to lead the way in new industries in the future, and to develop lead markets that offer solutions to common challenges. The Vanguard initiative promotes pilot projects in the areas of bioeconomy, efficient and sustainable manufacturing (ESM), high-performance production through 3D printing, as well as new nano-enabled products. Together with Catalonia, Lombardy is a leading region in the pilot on ESM and a participating region in the pilot on high-performance production through 3D printing.

Baden-Württemberg, Catalonia and Lombardy are involved in the Four Motors for Europe initiative. This is a multilateral working community made up of the three case study regions and the Rhône-Alpes; the partnership agreement signed in 1988. The strategy developed by the Four Motors in recent years focuses on strengthening economic competitiveness, science and technologies through collaborative projects between regional actors. Thematic working groups work to gather economic intelligence in support of collaborative projects and to develop effective joint applications to European calls for proposals.

A central framework for Baden-Württemberg's international cooperation activities, with its neighbouring regions, is the EU strategy for the Danube Region, developed by the European Commission, endorsed by the European Council in June 2011, and subsequently implemented. The Danube Region Strategy, which is associated with the idea of generating further convergence within the EU, was created on the initiative of several governments and other local and regional authorities in the EU that are part of the Danube Region. The Danube Region encompasses regions in Austria, Bosnia-Herzegovina, Bulgaria, Croatia, the Czech Republic, Germany (especially Baden-Württemberg and Bavaria), Hungary, Moldova, Montenegro, Romania, Serbia, Slovakia, Slovenia and Ukraine. The central aim of the Danube Region Strategy is to strengthen the cross-border bilateral and multilateral cooperation of the member regions in selected areas in order to advance the objectives of the macroregion. It addresses a wide range of issues, which are divided among 4 pillars and 12 priority areas.

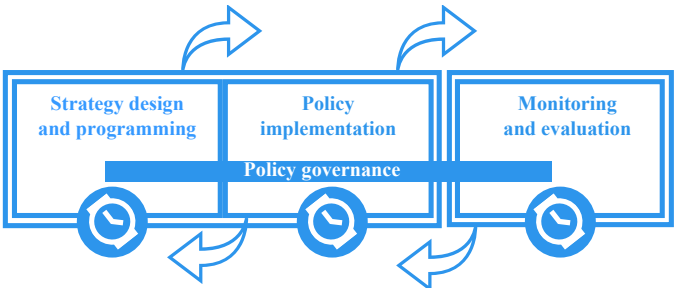
In addition to regional governments and public authorities, regional stakeholders also take it upon themselves to engage in international cooperation activities. This is the case of regional clusters in Pays de la Loire, which are involved in international partnership and interclustering activities. For instance, the EMC2 cluster for advanced manufacturing technologies has organised an Intercluster Brokerage Event since 2011 to discuss opportunities to join EU-funded projects and strategies for cross-cluster collaboration. This provides the cluster with the opportunity to network with European clusters and research centres.

The Pomorskie region is also an active player in European cooperation, especially in the Baltic Sea macroregion. The Marshal Office (regional authority) is positive about how the region has contributed to and benefited from transnational projects. The main asset of one of the projects, TransBaltic, was the transport connections between the Baltic and the Adriatic Seas. The project's main aim was to maximise the positive economic effects of this transport corridor, designated for development under the EU's Trans-European Networks-Transport (TEN-T) policy. Based on the project, the region included an additional railway line, the link between the ports of Szczecin and Gdańsk, into the development plans. The project also developed a comprehensive action plan for the Baltic Sea macroregion to turn the corridor into a functional gateway between north and south.

5 Monitoring and evaluation

Monitoring and evaluation is a crucial part of the policy cycle and also an important factor of policy capacity. Policy capacity can be captured throughout the main stages of policymaking such as policy/strategic design, policy implementation, policy monitoring and evaluation with the fourth (horizontal) element related to policy governance including coordination and cooperation (Figure 11). Ideally, monitoring and evaluation should feed back to strategy design and programming, and should influence the new generation of policy interventions based on the lessons learnt.

Figure 11: Defining policy capacity in the key stages of the policy cycle



Source: *Technopolis Group.*

Monitoring processes embedded in the regional administration

All case study regions reported a similar approach to policy monitoring, notably that it is embedded in the regional administrative procedures and internal governance. In Baden-Württemberg, monitoring efforts were described as an ongoing process which is embedded in the day to day administrative procedures of the region; hence officials have to draft regular interim or progress reports about the projects they are conducting. In Pays de la Loire, the regional administration and the regional innovation agency monitor each policy measure and funding scheme funded by the regional council, collecting information on the number of projects, beneficiaries, funding and themes. Similarly, in Pirkanmaa, monitoring is an internal process.

In Pomorskie, the monitoring system is an internal one and is based on the inputs of the respective departments of the regional government. The regional development strategy as a whole is monitored by the Department of Regional and Spatial Development, and the Regional Operational Programme is monitored by the Department of Regional Programmes. The Department of Economic Development also monitors the progress on entrepreneurship, business development and innovation. In Lombardy, the RAA monitors and evaluates the regional industrial policy and its related programmes, in collaboration with its network of regional agencies. The implementation of the industrial policy is monitored twice a year through a formal process. In Sardinia, monitoring is carried out on a regular basis by the regional administrative authority in collaboration with the regional agencies and other organisations involved in policy implementation. In Catalonia, the RDA ACCIÓ has an internal team for strategy and competitive intelligence which collects and interprets monitoring information at the programme implementation level. Together with contextual information, this team is also in charge of compiling monitoring information to feed into the different monitoring arrangements of active industrial strategies.

Formalised monitoring

In many regions, monitoring is mostly formalised, as in the case of the Regional Operational Programme co-financed by the ESIF. The most comprehensive monitoring systems are found in relation to the regional operational programmes. In Sardinia, the regional authority has achieved significant expertise in policy monitoring due to the fact that monitoring has traditionally represented a formal EU obligation for the management of structural funds. In Pays de la Loire, the ROP monitoring system is managed by the regional council under the supervision of the European Commission and monitors only the industry-related policy measures and projects co-funded by the ERDF and ESF. In West Romania, the monitoring process is regulated at national level and complies with EU-wide regulations for the use of ESIF. The West RDA has its own department supporting the monitoring and evaluation of the ROP, whose staff submit regular monitoring reports to the managing authority. An assessment of the implementation of the SME funding in the region made recommendations for improving the monitoring system of the competitiveness programme. This was in order to include more detailed information on the sector of investments, as well as on the economic performance of the beneficiaries at the beginning and the end of the funding period (including data that could be used for counterfactual evaluation). In Pomorskie, the implementation of the smart specialisation strategy is systematically monitored and aims to track the process of economic and technological growth in selected areas. The growth dynamics of a given specialisation, in reference to the region, country and industry would also be monitored.

Project level monitoring

Another common trait among the case study regions is that monitoring processes are conducted at the project or programme level, rather than at the strategy or policy level (the implementation of which relies on a mix of different policy schemes and projects). In Pays de la Loire, public authorities monitor the performance of regional industrial policy schemes, but there is no formalised or centralised monitoring process of industrial policies. In Pirkanmaa, monitoring practices are linked to strategy level objectives, but the monitoring data are collected at project level, which results in a gap in evidence and available data. The implementation of the strategy is assessed in a financial forecast through the strategy indicators and the complementing effectiveness indicators. It is an issue that the impact and the broader picture remain unclear as the focus of monitoring is at project level. The achievement of objectives is monitored in the operational and financial reviews and in the annual report and financial statements. In Baden-Württemberg, interim and progress reports are delivered for each co-financed project. Normally, participants of milestone meetings come from various units and discuss reports and open questions. Generally, when problems arise within specific projects, project managers immediately contact their direct superiors to find a solution and eventually make adjustments; external stakeholders are not normally consulted. This method is seen as efficient and, hence, there are no plans to establish a 'proper' monitoring system.

Company-level surveys

Some of the main monitoring practices mentioned in the case study regions include company-level surveys, case studies and indicator scoreboards. In Catalonia, company surveys usually take two forms: small beneficiary surveys to get feedback on the implementation of calls for projects (not usually published); or large-scale surveys of the industrial base used in studies such as the annual report on the Catalan industry, the innovation barometer, and the analysis of exports of Catalan companies. In other regions, survey methodologies are not always effective. In Baden-Württemberg, it was reported that the response rate to surveys is often inadequate and cannot deliver a sound evidence base. In Lombardy, Pirkanmaa and Pomorskie, the key policy intelligence observatories (see Chapter 3) are linked to the monitoring process.

Indicators

The case study regions use a range of similar outcome, result and performance indicators to monitor policy implementation. In West Romania, indicators for the monitoring system include the indicators submitted by the beneficiaries in the application and throughout the project implementation period (such as financial indicators or turnover, as well as the number of jobs created). In Pays de la Loire, output indicators (the number of participants in a training session) and result indicators (the number of new products on the market) are available in the operational programmes.

In Lombardy, the Strategic Document for Industrial Policies 2013–2018 and the RIS3 have defined two sets of key indicators against which performance can be assessed that are distributed across the following four categories.

- **Context indicators:** These are identified in collaboration with Eupolis Lombardia, the regional statistics office. Their aim is to draw a picture of the regional economic system and to measure its development.
- **Strategy implementation indicators**: These are divided in two groups: the 'well-being and competitiveness' indicators (which are expected to define the regional priorities in terms of social wellness) and the 'general' indicators (which are closely tied to the key variables that must be observed in the short-term to track the trajectory of the strategy implementation and the achievement of objectives).
- **Result indicators**: These have been designed to measure the change connected to the implementation of regional initiatives.
- **Impact indicators**: These have been designed to relate the change of context indicators on which regional policies intend to act.

In Catalonia, the RIS3CAT monitoring framework is divided into a set of outcome indicators and performance indicators. Outcome indicators indicate progress towards the operational objectives of the RIS3CAT action plan and the monitoring framework sets out both the baseline and 2020 targets for each of them. In Pomorskie, the regional development strategy defined several key performance indicators (KPIs) against which progress can be monitored. These include contextual indicators such as those related to business investments, business R&D and innovation, cooperation among companies and enterprises with access to high-speed internet.

Evaluations

Evaluation processes

In general, the case study regions have no systemic evaluation practice or standardised evaluation process. Again, it is the regional operational programmes that are evaluated, following a formalised approach based on external assessments. Comprehensive evaluations of single policies or programmes are primarily conducted in the framework of ERDF and ESF funding which are made public. Despite this, it has often been reported that evaluations are becoming more and more relevant and efforts are being made to develop more formal procedures. It has also been mentioned that constant improvement and adoption of the evaluation process would be in the interest of all stakeholders.

In Baden-Württemberg, Catalonia, Lombardy, North Brabant and Pays de la Loire, evaluation is more a 'collection' of evaluations of single policy measures carried out from time to time. It was also highlighted in some of the case studies that proper project evaluations are often too costly to be justified, which is also a reason behind the selective approach of evaluating policy measures. In Pays de la Loire, evaluations are focused on specific policy support schemes or specific structures,

rather than on the overall policy strategy review or 'meta-evaluation'. In Baden-Württemberg, the decision to evaluate a specific measure is normally taken by the respective department of the ministry. This generally takes place in coordination with the head of the department or with higher levels of authority. Typically, if there is a decision to monitor or evaluate a specific measure, this is already determined within the approval procedure of the policy by the Council of Ministers. In Pomorskie, both the EU co-financed regional operational programmes and its own regional development programmes are subject to evaluation. Internal teams within Catalan ministries and agencies usually conduct analyses on an ad hoc basis, sometimes with external consultancy support. Sporadic internal analyses often make their way to public reports and studies, which are then used to make the case for further policies and support programmes (as part of the policy intelligence process). However, there is often no systematic triangulation of findings from different analyses. While there is a considerable amount of information about what the situation has been at several points in time, there is a lack of openly accessible evaluation reports with specific recommendations on how to improve the effectiveness and impact of public interventions. Internal evaluation reports often contain sensitive or commercial information and are therefore not made available to the public.

National level evaluations

Another feature is that most of the evidence on the effectiveness and efficiency of policy programmes comes from national level evaluations that also have a regional dimension, such as in the case of North Brabant, Pirkanmaa, Pomorskie and West Romania. Romania does not have a tradition of policy evaluation and evidence-based policymaking. Since most funding programmes are available at national level, the evaluations can be commissioned only from that level. In addition, evaluations are mainly driven by the ERDF monitoring and evaluation processes and the ERDF policy cycle.

External evaluations

The selected measures are usually evaluated externally. In Pirkanmaa, evaluation relies on commissioning studies from universities and external agents given the limited internal human resources of the council and the city. Similarly, external evaluations are commissioned in Baden-Württemberg, Lombardy and North Brabant. In Romania, evaluations are generally contracted out to external consultants; some policy evaluations (such as the one for the Growth Pacts) have been undertaken by the World Bank. Counterfactual impact evaluations and theory are not a common practice. In contrast, in Pomorskie, the upcoming assessment of the most recent regional strategy will be carried out internally with the consultation of internal stakeholders. As for regional operational programmes, the evaluation programme for 2007–2013 in Poland was carried out independently; the evaluation plan was drawn according to the national provisions on the regional operational programmes. The Gdańsk Institute for Market Economics was the key partner in the evaluation process.

In the most recent programming period, the European Commission asked regions to conduct a counterfactual analysis, which represents an important challenge for EU regions. This was the case for Sardinia, called upon to use new tools of analysis that must be able to increase their institutional capacity in policy evaluation.

Counterfactual analyses have been used or experimented with in Catalonia, Lombardy and Pomorskie. Since 2016, the feasibility of using counterfactual impact evaluation methods has been explored by the Catalan agency ACCIÓ, which is participating in Nesta's Growth Innovation Lab, a project that aims to develop experimental policy capacity, and to share evidence on innovation and high-growth entrepreneurship and business growth programmes. In particular, this project focuses on the use of randomised controlled trials to improve the quality of evaluations in the domain of innovation and growth policy. Four of the Polish regional operational programmes were evaluated using a counterfactual analysis in 2014 in cooperation with the national Ministry for Infrastructure and Development, the National Statistical Office and the regional Marshal Offices – such as that of Pomorskie. The evaluators tested the potential of counterfactual analysis as the main methodology. The main objective was to assess the value of various business support measures financed through ERDF. Final results indicated that the most significant differences between supported and non-supported companies concerned changes in levels of employment.

On the other hand, in Pirkanmaa, counterfactual analysis is not used, while in Lombardy there is no systematic evaluation of the regional projects, programmes and policy measures implemented in support of industrial development. As such, there is a limited amount of evidence regarding the effectiveness and impact of industrial policies. Rigorous evaluations and studies carried out by university researchers and the Bank of Italy are more common at a national level, and they usually focus on a certain instrument rather than on a region or territory. Counterfactual approaches based on econometric models and analyses are employed mostly *ex ante* and *ex post* to assess the effects of a specific policy and/or instrument. Typically, these rely on large databases and are not normally focused on ERDF funding, instead they analyse instruments financed by several sources including national and regional resources.

Monitoring and evaluation results feed into the policymaking process

In general, the conducted case studies reported that no specific changes in policy approaches can be attributed to official monitoring or evaluation. Formal monitoring exists on paper, but the results have very little influence on the decisions taken. In Lombardy, it is still difficult to appraise the extent to which these have a real impact on the decision-making process. In Pirkanmaa, however, it is internal reviews and informal discussions within the local administration that stir policy development. This is the case of the internal monitoring of the activities of Tredea (the Tampere Region Economic Development Agency) being directly conducted by the city of Tampere. The review was ongoing at the writing of this report (April 2017) and the results were not yet

official. The interviewees stated that the first findings and conclusions relate to the clarity of distribution of labour, and roles between the actors providing regional business development services, as well as marketing and place-marketing activities, and the service portfolio available. Based on the evaluation findings, the city of Tampere is going to develop its service contract with Tredea, as well as its roles and service provision. In West Romania, the ROP Management Authority is the Ministry of Regional Development, the institution in charge of overall monitoring and evaluation, and taking decisions with respect to any bottlenecks encountered. West RDA also uses the Regional Operational Programme monitoring system to identify whether there are bottlenecks or potential areas that need interventions in the delivery of the programme at regional level.

Positive examples can be also highlighted. In Catalonia, ACCIÓ has a remit of supporting all active strategies and policies at any given time with their mix of support activities. This process is also necessary to monitor the work and performance of ACCIÓ according to its action plan, providing accountability to the different ministries. It is expected that, as more information is compiled by ACCIÓ's internal team, this will increasingly be used to evaluate and influence the design of new support instruments (by ACCIÓ and others), as well as new industrial policies and strategies. In Pomorskie, the monitoring of the smart specialisation strategy began with the implementation of the process for the selection of smart specialisations. It is being conducted in the scope of the 'participatory evaluation' which is aimed at identifying potential problems for the envisaged activities and, as a consequence, drawing conclusions that may improve the process. Participatory evaluation is an approach that involves the stakeholders of a programme or policy in the evaluation process. The process of selecting smart specialisations is cyclical. Based on assumptions, the process will be repeated every two years. This principle introduces the possibility of selecting and supporting new smart specialisations when the economic and technological potential is sufficiently developed, and the strategies of specific actors, enterprises and scientific units in the new economic area are modified. Agreements on the development of smart specialisations, signed with partnerships representing selected areas, will be valid for three years. Following this period, and based on the evaluation of the implementation of objectives and projects envisaged in the agreement, it will be possible to retain 'smart specialisation' status.

The results of monitoring and evaluation processes are rarely if at all available to the public, such as in Pays de la Loire. Similarly, in Baden-Württemberg, due to the emphasis on internal procedures, monitoring results are seldom published, except for the report on the medium-sized economy (Ministry of Finance and Economy of Baden-Württemberg, 2015) and some selected single measures; some measures were evaluated externally but the final reports were only partly published. On the other hand, in West Romania, the results of the monitoring process are published in annual implementation reports which are available on the website of the Ministry of European Funds – but aggregated at national level.

Finally, the case studies highlight three challenges and weaknesses in the evaluation practices of regional industrial policy.

The governance of evaluation units is still weak: Investments on behalf of regional policymakers in strengthening the capacity (available human resources and skills) of evaluation units within regional administrations are weak. It was reported in Baden-Württemberg that proper project evaluations were often too costly to be justified, particularly at a political level.

This issue becomes even more challenging to the extent that the evaluation standards in the framework of ERDF 2014–2020 funding have become much more complex compared with previous programming periods, requiring more expertise (such as a theory-based evaluation approach or counterfactual analysis). In Poland, four of the regional operational programmes were evaluated using counterfactual analysis in 2014 in cooperation with the national Ministry for Infrastructure and Development, the National Statistical Office and regional Marshal Offices – including Pomorskie. The evaluators tested the potential of counterfactual analysis as the main methodology. The main objective was to assess the value of various business support measures financed through ERDF. However, interviews highlighted that the key challenge to monitoring and evaluation was the limited resources available for the actual evaluation and data collection.

Regional policy strategy documents are rarely based on well-developed logical frameworks: Theories of change, as with evaluation, rarely articulate the regional challenges with the objectives of the policy, the objectives with the outputs, the expected outcomes and the impacts of the intervention. In addition, when such frameworks are in place, the monitoring, as already mentioned, is conducted at the project or policy scheme level, rather than at strategy level which makes it difficult to evaluate the regional policy intervention. Without a clear logical framework, the analysis of the contribution of the strategy to the observed changes is even more complex, and the evaluation unit has further difficulty in separating the impact of the strategy from that of other influencing factors.

The availability of data at regional level to monitor specific results and impact indicators hampers the evaluation capacity: This is the case as reported in the Pomorskie regional case study on the availability of regional data and especially trade data that makes statistical analysis and eventually the monitoring of economic progress in certain areas more difficult.

6 Good practices and their transferability

This study was designed to identify good practices in order to further develop regional industrial policy capacities across Europe. The Interreg IVC programme defines good practices as[24]

> *an initiative (for example, methodologies, projects, processes, techniques) […] which has already proved successful and which has the potential to be transferred to a different geographic area. Proved successful is where the good practice has already provided tangible and measurable results in achieving a specific objective.*

There are, therefore, two key elements to identifying good practices: their proven performance and effectiveness in achieving intended goals; and their potential for being transferred to other regions. These two requirements, however, represent a significant challenge when identifying good practices in industrial policy capacities. The reasons for this are three-fold.

- Given that policy capacity relates to the capacity of government and other public actors to plan, develop, implement and evaluate purposeful solutions to collective problems (Denis and Lehoux, 2014), it is often difficult to pinpoint specific initiatives which can be said to contribute to regional policy capacity. In other words, given the 'soft' nature of policy capacity, it is often a challenge to present policy capacity as a specific initiative, policy or instrument that can be described as a good practice.
- There is a significant lack of evidence illustrating the success or failure of specific initiatives contributing to regional industrial policy capacity. This is, in part, linked to the lack of a stronger evaluation culture in the case study regions. As a result, defining to what extent identified actions or initiatives have been successful in enhancing regional industrial capacity is extremely complicated. The assessment of whether regional actions or initiatives have been successful often hinges on the perception of local stakeholders, rather than on independently produced qualitative and quantitative evidence.
- Given that many of the factors defining the 'level of strength' of regional industrial capacity are closely linked to local institutional, political, historical and cultural contexts and frameworks, defining the capacity for transferability is also extremely challenging. One of the main factors to take into account when defining this potential is the level of autonomy and the types of powers of regional governments.

As a result of this, this chapter has been organised around a three-tier structure.

- First, it looks at a broad set of common features of case study regions in terms of how they design, implement and govern their industrial policy.
- Second, it identifies and describes a sample of innovative and interesting good practices across the different good practice criteria (see Annex A). This section is meant to showcase good practices which contain a specific element or originality compared to the work being conducted by other case study regions.
- Third, it presents an overview of all of the individual good practices identified at the case study/region level, according to the different good practice criteria used as part of this study. This section also provides a broad analysis of conditions for transferability of these good practices.

Common features of strong industrial policy capacity regions

This study has shed light on common features across a number of the case study regions on the different selected good practice criteria (see Annex A). Rather than being specific initiatives or actions, these common features are often reflected in regional industrial policy mixes (such as in the choice of instruments), as well as in the way the agenda-setting process is conducted. They tend to represent a state of mind or a general approach to how industrial policy is carried out in highly industrialised regions.

Industrial policy governance

In terms of industrial policy governance, there are three features which strongly stand out in the analysis of the case study regions: the existence of multilevel governance cooperation procedures and instruments (formal and informal); the widespread use of participatory methods in the agenda-setting process; and the development of strong policy implementation and executive agencies.

A cross-cutting feature of the case study regions is the existence of collaboration between different tiers of government in industrial policy, namely local (such as city level), regional and national. In a number of cases, there are also mechanisms allowing for interregional collaboration at the country level. Given the different institutional and regulatory contexts of each of the case study regions, the nature of cooperation mechanisms and channels tends to differ; from more informal mechanisms, to formal and institutional tools and channels.

24 http://www.interreg4c.eu/good-practices/capitalisation/creativeindustries/creativeindustriesreport/introduction/

Coordination between regional and lower levels of government

This type of coordination (between counties and cities for instance) was observed in all the case study regions, mainly by means of working groups (Pomorskie) or by regular meetings and commissions (Baden-Württemberg, Lombardy, North Brabant and Pays de la Loire). In Pomorskie in 2003, the Marshal Office of the Pomeranian region initiated a Metropolitan Board with the aim of stimulating the integration of cities within the Tri-city region (see Chapter 3).

Aligning regional industrial and innovation policies with national policy frameworks

In the majority of the regions, explicit coordination mechanisms have been set up in order to align regional industrial and innovation policies with the national policy frameworks, as well as to monitor the implementation of joint programmes which are co-financed by different levels of government. These mechanisms can take the form of a contract (Pays de la Loire and Pomorskie), a joint agreement (Lombardy and Sardinia) or a pact (Pirkanmaa) signed by the involved parties.

In the regions with high levels of autonomy, such as Baden-Württemberg and Catalonia, coordination mechanisms between the national and regional levels of government tend to be more limited in scope and binding capacity. It is worth noting that vertical collaboration mechanisms between regional and national levels of government are often two-directional: they not only allow for national and central governments to influence the regional industrial policy agenda, but they also allow regions to convey knowledge and information on successful regional instruments to the national level in order for them to be also used in other regions. In Lombardy and Sardinia, the Conference of Regions and of Autonomous Provinces aims to develop a common stance on the interests of the Italian regions (and autonomous provinces) in order to lobby the national government, the Italian parliament, other Member States and EU institutions. In addition, central and national governments play a key role in providing some evidence on the effectiveness and efficiency of policy programmes, by means of national level evaluations containing a regional dimension.

Multistakeholder approaches

Although (in most case study regions) regional authorities play a driving and central role in supporting the long-term industrial development of the region, as well as in setting the regional industrial policy agenda, regions are generally adopting multistakeholder approaches to the development of their industrial and innovation agendas and strategies.

This observed shift since the early 2000s in the case study regions has resulted in a general perception of the changing role of regional authorities in the design and implementation process of industrial policy – from a programmer or funder, to a facilitator and inspirer. In Baden-Württemberg, Lombardy, Pirkanmaa and Sardinia, it was specifically highlighted that the role of the regional level is as an important facilitator of institutional cooperation between and across public and private sector organisations. Along with this, regions are paying greater attention to consulting, building and opening dialogue with the industrial sector on the basis of both formal and informal communication channels.

The vast majority of regional stakeholders generally consider 'open approaches' to policy design as a good practice, given that they help build a common vision of key regional challenges to reach a consensus on the key policy orientations and sectors of specialisation. This, in turn, sets the basis for a more effective and efficient policy roll-out and implementation phase. In addition, this type of approach helps address complex issues and challenges, given the involvement of different types of expertise, and the different visions and perspectives coming from a variety of different stakeholders.

The involvement of the private sector in the agenda-setting process – particularly in regions where public–private cooperation is an emerging phenomenon – has been strongly supported by the European Commission's approach to the EDP as part of the S3 development process.

Implementing agent or agency

Finally, the study has shed light on the importance of the capacity of the implementing agent or agency (in terms of technical know-how and the availability of human resources) in the implementation of industrial policy. In the case study regions, there are a number of examples of dedicated implementation agencies that are disassociated from decision-making or administrative branches of government (see Chapter 3). These agencies tend to have strong expertise in the operational implementation of policy instruments. In Baden-Württemberg, measures relating to qualification, consultancy and contests are processed and selected by ifex which, as previously mentioned, is an independent unit in the Ministry of Economics, working as a project and support agency, information hub and provider of ideas. However, ifex has less autonomy than state agencies as all its tasks are mainly linked to the administration and implementation of policy measures.

Industrial policy design

The analysis of the approach to industrial policy design has revealed a very strong level of diversity across the case study regions. This mainly stems from the fact that regional industrial policy is an emerging policy field at regional level. This does not mean that regions have not addressed the issue until recently, but rather that industrial policy is still seldom recognised as a stand-alone policy field within regional policy. As a result of this, the range of policy areas considered under different regional industrial policy frameworks varies considerably across the case study regions: from innovation and business research, clusters, and SMEs and entrepreneurship, to regional marketing and investment promotion (typically also covering FDI activities) and spatial development. In many cases, industrial policy is more widely assimilated to regional economic development.

Industrial policy's links to regional innovation policy

Despite the diversity of the policy areas covered under regional industrial policy frameworks, industrial policy is closely linked to regional innovation policy. In addition, the case study regions display a high level of overlap and complementarity between industrial policy orientations and regional S3, adopted as a condition for allocating ERDF funding. While, in some cases, S3 strategies have influenced the scope and design of regional industrial policy, in others, S3 strategies have been developed in parallel to the updating or designing of industrial policy-related documents and instruments that have enabled strong levels of complementarity. Given the importance of innovation to industrial development, this consistency is a necessary requirement for strong industrial policy design.

Limited set of priorities

The adoption of S3 strategies as a key regional industrial policy document reflects a general trend towards a higher concentration of resources – as well as a more focused policy scope – around a limited set of priority industrial sectors, technologies and markets. Regardless of whether S3 strategies have been developed with the ambition of smartly specialising or diversifying the economy, the case study regions' policies have, as a common feature, a focus on specific regional characteristics; their policy choices are all based on an extensive review of the regional endowments, potential and opportunities. These reviews are often conducted on the basis of broad consultation processes of local stakeholders, and the use of intelligence tools such as observatories, studies and surveys.

In a significant number of case study regions, the involvement in European level initiatives such as the Vanguard Initiative for New Growth through Smart Specialisation, or the Four Motors for Europe alliance, plays an important role in shaping and influencing the regional industrial policy agenda. However, while some regions appear to participate in these initiatives on a case-by-case basis, others seem to clearly be using international cooperation to strategically and systematically drive their industrial policy at home. In these cases, international cooperation not only provides momentum for the implementation of the industrial policy agenda, but it also represents a source of knowledge and inspiration which, in turn, strengthens the capacities of local policymakers and practitioners.

Industrial policy mix

A 'critical mass of support'

The diversity of regional contexts, challenges, and needs across the case study regions is reflected in the diversity of policy mixes and instruments implemented to support industrial development. Yet, in spite of this diversity, regions frequently highlighted the need to achieve a critical mass of support in the sense of concentrating resources on a few key policy measures in order to generate meaningful and sustainable change. Policymakers may be under pressure to launch new support measures but they do not have a lot of room to manoeuvre, in terms of financial and human resources. Several interviewees noted that it is very difficult to generate systemic change with interventions on a small scale. Thus there appears to be a strong trade-off in terms of the number of policy objectives being pursued, the number of instruments being used to pursue them, and the capacity to generate lasting and meaningful change under any of these objectives.

Improving general framework conditions

Regional industrial policy mixes tend to include policies and instruments, which are either geared to improving general framework conditions for industrial development, or targeted at directly giving support to industrial ecosystem stakeholders. As for the former, the majority of regions have dedicated resources and policies to enable collaboration across industrial actors and stakeholders, particularly by means of clusters and other forms of networking. This is, perhaps, the most frequently found element across the regions. An emerging trend in the support of framework conditions appears to be the use of policy instruments aimed at developing other forms of networks and communities in support of industrial development. These forms of collaboration tend to be broader than clusters and are not always anchored to one specific sector or market. Examples of this include the ACCIÓ grants for RIS3 communities, which are part of the RIS3CAT Catalan Smart Specialisation Strategy. RIS3CAT communities have been created as voluntary associations of companies and stakeholders in the Catalan innovation system. These communities are an essential and innovative element of RIS3CAT. As active stakeholders in the Catalan innovation ecosystem, they ensure the participation of companies and stakeholders from the system in defining, monitoring and evaluating the priorities for R&I programmes. Their multidisciplinary profile and bottom-up focus make them leading players in EDP, which leads to increasing specialisation as they identify and generate projects related to specific topics in the leading sectors.

In Pirkanmaa, at regional and local level, the main type of policy instrument to implement the economic policy objectives is the support to industrial and innovation platforms. This comes from the general policy goal to create an open and collaborative business environment on the basis of which industries can innovate, reinvent themselves and face global competition. This is also in line with the recent policy shift towards a 'platform-based' policy approach. Contrary to traditional cluster policies where the focus was put on cooperation between companies and research organisations, and on fostering R&I projects, the platform approach stresses the importance of communities, talents and global ecosystems.

Intensive use of financial instruments

Industrial regions also appear to be making a more intensive use of financial instruments as part of their efforts to adapt financial mechanisms to the objectives of specific emerging industries, or the transformation process regions aim to achieve. The underlying rationale behind the use of these instruments – as illustrated by the case of Lombardy – can be linked to issues such as:

- existing financial market gaps, evidenced by *ex-ante* evaluations of the regional financial ecosystem;

- the lack of access to financing, particularly for the most innovative SMEs at both an early stage (seed funding) and in the development stage;
- the greater efficiency of the financial instruments (compared to grant schemes) for regional public budgets, given the possibility of providing revolving funds which can be invested on commercial terms.

Industry 4.0

An additional recurrent trait across case study region policy mixes is the importance given to activities supporting the transition towards Industry 4.0 – an approach towards automation, data exchange and clean production processes in manufacturing technologies. Large manufacturing regions such as Baden-Württemberg, Lombardy and Pays de la Loire have Industry 4.0 high on the agenda. For instance, Baden-Württemberg has implemented the Allianz Industrie 4.0 initiative to encourage the uptake of advanced manufacturing solutions by industry. Allianz Industrie 4.0 intensifies the exchange between industry and technology representatives so that synergy potentials can be developed within the region. The Allianz Industrie partners want to give priority to SMEs on the transition to Industry 4.0 and to help employees to work in a transformative manufacturing environment. Other examples include the PRIs (Technocampus and the public–private technological research institute on advanced manufacturing) in Pays de la Loire, and the establishment of Industry 4.0 cluster initiatives in Catalonia and Lombardy.

Internationalisation of regional industry

An additional prominent feature of industrial policy mixes is the use of instruments in support of internationalisation of the regional industry. This generally translates into initiatives seeking to attract FDI into the region, or providing support for regional companies to expand their activities in foreign markets. The policy measures in the nine case study regions support different activities. In some regions, direct support is provided to export promotion (such as in Catalonia, Lombardy, Pomorskie and Sardinia), while in others the emphasis is on increasing companies' skills with a view to internationalisation and providing consultancy services (Baden-Württemberg and Pirkanmaa).

Showcasing innovative regional industrial policy capacity good practices

This section is designed to highlight specificities observed in case study regions. Rather than acting as a common guiding principle for regions seeking to enhance their industrial policy capacity, the following examples of good practices could serve as a source of inspiration for the development of innovative industrial policy initiatives. The innovative dimension of these good practices has been established on the basis of two criteria.

The existence of similar practices or policy traits in other case study regions: Certain good practices stand out as innovative, given the existence of one or two specific characteristics which are not observed in similar practices being implemented by other case study regions.

The knowledge and expertise within the team of experts responsible for conducting this study: The experts, having carried out the present study, have a good understanding of the regional industrial policy landscape and are thus capable of identifying innovation in regional industrial policy initiatives.

On this basis, a total of 12 innovative good practices deserve specific recognition. The following subsections provide a more detailed presentation of each of them (most have already been mentioned in previous sections of this report). Innovative good practices have been identified for three of the four good practice criteria categories (see Annex A), with 'monitoring and evaluation' being the only category for which no good practices are showcased. The absence of innovative good practices is due to the fact that none of the good practices identified display any particular innovative dimension. All case study regions have adopted similar, and somewhat standard, approaches to industrial policy monitoring and evaluation.

Industrial policy governance

In industrial policy governance, there are four innovative good practices to highlight:

- industrial dialogue in Baden-Württemberg;
- bottom-up policy coordination through Top Sector teams in North Brabant;
- unitary programming in Sardinia;
- Growth Pacts in Pirkanmaa.

Industrial dialogue

Industrial dialogue and stakeholder participation in strategy development is a specific feature of the industrial and innovation policy of Baden-Württemberg. It involves discussions with the businesses, chambers of commerce, associations, trade unions and research, in the form of both sectoral and thematic dialogues.

In Baden-Württemberg, five industrial dialogues have been in existence since 2011. These were created to address different industrial topics and sectors: advancement of ICT policies; automotive and utility vehicle dialogues; mechanical engineering dialogue; sectoral dialogue on aerospace; and economic dialogue on technology transfer. The aim of the dialogues is to detect sector-specific problems or challenges early on, to ensure that the Ministry of Finance and Economic Affairs[25] is informed about sector-specific developments, and to facilitate the exchange among concerned stakeholders. Dialogues are supervised and initiated by an official of

25 The Ministry of Finance and Economic Affairs Baden-Württemberg was a ministry in the administration of the state of Baden-Württemberg. It came about through the change of government in 2011 and the decision to merge the Ministry of Finance and the Ministry of Economy. After the parliamentary election in 2016 and the formation of a green-black coalition, the ministry was again divided.

the ministry. The kinds of stakeholders involved in the specific dialogues depend on the sector. Normally, these cover representatives from labour organisations and industry associations, as well as researchers from the respective fields. In addition, the format of the dialogue (such as conferences or workshops) and the sequence of the events vary. The participants generally consider the dialogue as useful, given that it serves as a platform to get in touch with groups and organisations that are normally hard to reach, such as scientists and large companies. This practice could be easily adopted in other regions in any kind of development phase or institutional setting, but it requires a willingness to build social dialogue between policymakers, business organisations and trade unions – considered as equal partners – and to build a shared vision on the future growth of the region. It may also require time to create such conditions for dialogue. Finally, it can be transferred only to regions enjoying a high level of autonomy (Catalonia and Lombardy) or a medium level (Pays de la Loire and Pomorskie). Transferring this practice to regions with a low level of autonomy has no relevance; in such cases, the social dialogue must take place at national level.

As opposed to multistakeholder dialogue initiatives identified in other case study regions, the industrial dialogue initiative stands out given the involvement of a broader set of stakeholders, including trade unions. In addition, industrial dialogues also cover a key component of industrial policy which is often neglected by policy mixes in other industrial regions, namely the availability of skilled workers.

Bottom-up policy coordination

Similarly, North Brabant's bottom-up policy coordination through Top Sector teams enhances industrial policy governance, given the possibility to promote multistakeholder involvement and cross-institutional collaboration. Regional (industrial) policy is largely driven by initiatives at, and funding from, the national level, with the specificities determined at regional or even local level. The design and funding of regional policy lies with the Ministry of Economic Affairs (EZ), with three separate policymaking pillars. While the ministry has been responsible for developing the overall framework for the Top Sectors policy, sector-specific roadmaps are developed by 'top teams' that have been assigned by the ministry. They consist, at board level, of a representative from industry, a researcher from a knowledge institute, a representative of the government, and an SME. Beyond the board level, governance within these 'top teams' varies according to the needs and philosophy of the members of the team, as decided by the board. Accordingly, development and implementation of policies for the top sectors takes place in the form of 'network governance', where some control over policymaking is given to private and non-governmental organisations. The roadmaps that these top teams produce provide action plans and agreements that determine how the sector can be strengthened in the coming years.

Given the use of this approach, the role of government has changed from programmer, and a source of finance, to facilitator and organiser. The national government is working together with representatives from business, knowledge institutions and other governments on shared visions, agendas and joint roadmaps. Together, these stakeholders form a 'golden triangle', collectively setting the agenda for each sector. This practice is transferable to other regions, but requires the existence of a community of stakeholders with prior involvement in regional industrial policy development.

Growth Pacts

Finally, on vertical multilevel governance coordination, the Growth Pacts used in Pirkanmaa represent an innovative example of how different government tiers can effectively coordinate in a context of shared responsibilities over industrial policy design and delivery. National level policies are prominent in Finland and have a significant impact on regional policies, since the majority of resources are at the national level, especially for R&I. Growth Pacts are a relatively new coordination mechanism between the national government and the cities and have been launched under the current central government; the government collects taxes and a part of this is allocated to the cities. This allocation happens through the Growth Pacts, which includes a decision on the budget and a plan based on how the cities wish to spend the money. The cities are free to come up with their own policy development goals and support measures, but they are stress tested by the national level through this process. There are also national level objectives disseminated through the Growth Pacts, such as increasing the amount of innovation public procurement.

The Growth Pacts are well aligned with all the other strategies. Their purpose is to agree between the government and the city, how the city will implement its planned activities and projects selected by the government in its region, particularly in the form of regional innovation and experimentation projects. The Growth Pact also includes additional funding from the government. The Growth Pacts are for three years (2016–2018). The monitoring and evaluation of the Growth Pacts is managed by a separate working group, set up by the Ministry of Economic Affairs and Employment, with members from the Ministries of Environment, Health and Social Affairs, Education and Culture, Transport and Communication and Finance, as well as from Tekes – the Finnish funding agency for innovation. This innovative good practice is transferable to regions in relatively small countries where the national level plays an important role in the design and implementation of industrial policy.

Unitary programming

In the case of Sardinia, the interviewees have stressed that, traditionally, the regional offices in charge of policies have struggled to collaborate and coordinate them effectively. This is mainly due to a substantial lack of reciprocal trust and social capital. In response to this, in 2015 the regional government introduced an important reform that improves the coordination mechanism between ministries and departments in the design and implementation of regional policies. This innovation – named unitary programming – involves programming all the available resources (EU, national and regional) at once

to achieve common objectives; each source of funding used to be programmed separately. Unitary programming guarantees a concentration of resources and coordination. This helps to avoid the same intervention being financed twice or a situation where policies financed with different funds are inconsistent with each other. In 2015, two committees were established to implement this new system of governance: the Steering Committee (*Cabina di Regia*) and the Executive Committee (*Unità di Progetto*).

Steering Committee: This is a political body which meets on a regular basis to discuss and set strategies on specific policy priorities. It is chaired by the president of the regional government and its composition varies depending on the policy agenda (participants are decided by the president). For instance, if the agenda concerns the competitiveness of companies, all the ministries with powers in this field, as well as the president, participate in the meetings. For each policy priority, the Steering Committee drafts specific policy documents which set objectives, strategies and actions, and allocates resources.

Executive Committee: From a technical viewpoint, the Steering Committee is supported by an Executive Committee whose composition, similar to that of the Steering Committee, varies by topic. It is coordinated by the general director of the Regional Planning Council (RPC), who invites the other participants – usually regional directors and officials coming from various regional departments and agencies. The Executive Committee does not have its own personnel; however, it can rely on RPC staff for secretarial services and from the various regional agencies and departments, according to its needs. Close coordination between the Steering Committee and the Executive Committee guarantees continuity between the political decisions and actual policy implementation.

Industrial policy design

In industrial policy design, there are four innovative good practices:

- participation in European level initiatives in Catalonia;
- the Strategic Document for Industrial Policies 2013–2018 in Lombardy;
- the use of information technology solutions in the design of industrial policy in Lombardy;
- competition-based approach to identify smart specialisation areas in Pomorskie.

European level initiatives

In Catalonia, involvement in international and European-led initiatives is considered to be a key source of knowledge and intelligence for the regional industrial policy design process. Catalonia is involved directly, or through projects, in existing European level initiatives such as Manunet, EFFRA, SPIRE and Clepa (automotive). Manunet is considered as having been a successful means of interregionally aligning funding for advanced manufacturing. Catalonia secured 20 projects under the last call and considers the experience as a success. Using such existing cooperation to identify interregional value-chains represents an important opportunity for the regional industrial base. The region is also involved in the Vanguard Initiative for New Growth through Smart Specialisation, which is an initiative for boosting new growth through bottom-up entrepreneurial innovation and industrial renewal in European priority areas such as advanced manufacturing. In fact, two pilot initiatives are being carried out in the fields of ESM (led by Catalonia, together with Lombardy) and High-performance Production with 3D Printing (Catalonia as a participating region). This involvement in European level initiatives illustrates clearly the region's commitment to international cooperation as a source of policy capacity. Catalonia is not the only case study region involved in international cooperation activities as part of its industrial policy mix, but the region stands out given the value it gives to this policy dimension, the volume of resources it injects into it, and the visibility it has gained at European level as a result. This practice could be easily adopted in other regions, but it requires long-term commitment to investment (human resources and finance). It takes time and effort to build strong cross-regional networks and take the benefit from EU initiatives in terms of visibility and territorial marketing.

Industrial development policy document

Lombardy is the only case study region which has adopted a specific industrial development policy document. The Strategic Document for Industrial Policies 2013–2018, represents the cornerstone of the industrial policy promoted and implemented at regional level, by the regional administrative authority. The document states that

> *the pursuit of the region's strategic objectives in industrial policy requires improving conditions for development at two levels: a) enhancing regional administrative and institutional capacities, and the supply of financing for firms; and b) supporting interventions in three key thematic fields: research and innovation; entrepreneurship and firm development; internationalisation.*

At each of these two levels, the document builds on statistical evidence, the needs of regional companies (identified by means of regional survey), and the recommendations developed by third parties (for example, OECD), which have led to the development of the specific policy response and framework. The strategic document sets out a clear vision of the regional challenges for industrial development, as well as its main assets to effectively address these challenges. It also provides a straightforward definition of fields of intervention (scope) and overarching objectives for the regional policy. It is worth noting, that for each of the intervention fields identified in the industrial policy document, an explicit link is made to the objectives specified in the general Regional Development Plan 2013–2018. This practice is transferable to regions with a high or medium level of autonomy where the national level plays a less critical role in the design and implementation of industrial policy. The development of a stand-alone industrial policy document requires having a strong set of data and indicators on the state of

industrial development in the region, in order to identify and select the right policy priorities and target sectors.

Information technology solutions

In Lombardy also, regional authority stakeholders take particular pride in the ability the region has shown in developing certain innovative approaches to policymaking, particularly those that make use of information and communication technologies. Since 2014, two integrated systems have been deployed by the regional administrative authority to inform the decision-making process with valuable up-to-date data. This refers to the platforms QuESTIO and Open Innovation, each of which contributes to specific aspects of the implementation of the objectives of the industrial policy. From a technical point of view, the regional agency Lombardia Informatica has designed, implemented and manages both of them on behalf of the regional authority. This practice is transferable to all regions, but it requires allocating dedicated financial resources to set up such IT tools, and to develop the technical capacities to run, maintain and use the platforms. It is likely that framework conditions in larger regions benefiting from a large institutional and budgetary autonomy are a more favourable ground for such a transfer.

QuESTIO has been created to map the main technical and economic characteristics of the nine areas of specialisation identified by the S3, and the main scientific and technical characteristics of the regional research infrastructures. The purpose of this instrument is to help the regional authority's administration to monitor the changes of the RIS and to define technology roadmaps and tailor-made work programmes in support of those transformations. Open Innovation is a web portal designed to create a 'socio-ecological relationship' environment that allows knowledge-sharing between entrepreneurial and research actors. The aim of this initiative is to give companies the opportunity to discover new technological and social challenges, and to answer those challenges through the creation of new value-chains on the basis of the skills identified by QuESTIO.

Smart specialisation areas

As previously highlighted, the use of open and multistakeholder approaches has become increasingly frequent in the design of industrial policy and agenda-setting processes. This has been driven, in part, by the approaches developed by the European Commission to develop S3 strategies based on the EDP concept. However, the case of Pomorskie stands out given the application of a competitive-based approach to the identification of smart specialisation areas. Here, although multistakeholder cooperation was not a traditional approach nor in the culture of the region, the most recent smart specialisation strategy development has been unique. Pomorskie is the only Polish region where an open competition for the identification of target areas has been published and a transparent bottom-up approach has been adopted. Pomorskie successfully applied a negotiating approach based on the participation and involvement of various partner institutions, entities and communities. Overall, some 400 entities have been involved in the process, including around 300 large and small companies. The competition-based development process is a practice that can be replicated in future development programmes and adopted by other regions, particularly those where there is not yet a bottom-up approach in place for priority setting.

Industrial policy mix

In industrial policy mix, four innovative good practices can be highlighted:

- technocampuses and regional innovation platforms in Pays de la Loire;
- the Allianz Industrie 4.0 initiative to encourage the uptake of advanced manufacturing solutions by industry in Baden-Württemberg;
- the Demola Tampere initiative;
- the Regional Competence Centre for Supplier Development in the automotive sector in West Romania.

The first two innovative good practices are highlighted given the emphasis they set on the rapid deployment and upscaling of advanced manufacturing technologies, while the second two are showcased given their emphasis on skills development for industrial development.

Technocampuses and regional innovation platforms

In Pays de la Loire, technocampuses and regional innovation platforms have been designed and implemented with the aim of developing technology and R&D platforms accessible to regional actors (including SMEs), in order to favour the upgrade and modernisation of productive capacities. The region's 23 PRIs play an essential role in the diffusion of R&D results to local industries. PRIs were set up in 2009 in Pays de la Loire in order to find solutions to the technical needs of companies through specialised and agile regional collaboration networks, and as a response to the financial and economic crisis that impacted the industrial sector. Financial support of the region is guided by cooperation contracts signed with PRIs, based on three-year strategic plans. This support can take various forms including property investment, equipment purchases or the funding of human resources.

The region's four technocampuses are public–private infrastructures that concentrate funds in selected regional sectors in order to support advanced manufacturing in regional enterprises. The technocampus platforms are certainly the most representative public–private infrastructures in Pays de la Loire dedicated to advanced manufacturing. The innovative nature of this good practice stems from the fact that it concentrates massive public–private investment around regional excellence sectors. The investment in the buildings alone for the three first platforms amounts to €90 million. Technocampuses are shared technological research platforms that bring together high-performance materials and industrial and academic players that work on strategic sectors. They aim to position the region at the forefront of advanced manufacturing by encouraging an interdisciplinary approach and collaborative R&D.

This practice is also transferable to other regions. However, it requires a commitment to long-term investment from the regional authorities and good technical capacities in financial engineering to combine different sources of funding (regional, local, national, EU and private), a mix of different types of financing (grants, reimbursable grants, guarantee mechanisms and equity funding) and policy measures (such as those dealing with property and human resource training programmes). It also requires conducting, by sector and subsector, in-depth reviews of SMEs and large companies' innovation needs to check the technical feasibility, the potential market and the business model for such innovation platforms.

Allianz Industrie 4.0 initiative

In Baden-Württemberg, the rapid deployment and up-scaling of advanced manufacturing technologies has been supported by the Allianz Industrie 4.0 initiative. It intensifies the exchange between industry and technology representatives so that synergy potentials can be developed within the region. The priorities of the Allianz Industrie partners are to support SMEs in:

- participating in Industry 4.0;
- accessing advanced manufacturing technologies;
- preparing employees to work in a transformative manufacturing environment.

Under the umbrella of Allianz Industrie 4.0, a number of initiatives (such as cross-sectoral working groups and collaborative research) and projects have been initiated.

100 locations for Allianz Industrie 4.0 in Baden-Württemberg: Within this competition, the region of Baden-Württemberg is awarding innovative solutions for the digitalisation of the value chain in the industry. The competition is primarily aimed at companies that operate as suppliers and users of innovative solutions. SMEs are particularly encouraged to submit their ideas.

Advising and mentoring SMEs about Allianz Industrie 4.0: This includes information on the implementation of Industry 4.0 projects, initial consultation (such as workshops) on how to integrate Industry 4.0 in the value chain, the research and selection of innovation partners, and project planning and project support.

The Demola initiative

Demola was originally launched as a joint initiative between the Nokia Research Centre and the Tampere University of Technology in 2008, and soon obtained further support from the city of Tampere. Demola is part of the Hermia Group, an organisation established for supporting knowledge and technology transfer in the Pirkanmaa region. The Demola concept was a success and in 2011 it started to expand internationally (proving that it is a transferable practice); as of 2017, the Demola network is operational in 12 locations in 9 countries. The concept is centred around the following elements:

- a multidisciplinary student team gathers candidates from the universities and a project contract is signed by the stakeholders (the company and the team) including issues related to IPR and the timetable;
- concept development starts (lasting 3–8 months), with the support from Demola and the company, including a concept or prototype test conducted with the client;
- a demonstration of the concept or prototype is carried out by the student team, followed by project evaluation and the finalisation of licence agreements.

The benefits of Demola are not limited to a single company, since the student team also has a chance to utilise the created asset by setting up a start-up company; all the IPR generated during the project belong to the student team. At the end of the project, the partner company can acquire a licence for the results and reward the students for their work according to the previously agreed performance criteria. If the company wants to use the results commercially, they can buy a non-exclusive licence. An advantage to this is that the client does not have to pay for the innovation project, only for the results if they want to use them commercially. Students may also be recognised for their talent, leading to employment.

Demola carries out some 100 projects with 450 students each year in Tampere. It is worth noting that 40% of the students who participate in the programme are international, which gives Demola a global character right from the start. The partner companies have so far licensed 80% of the project outputs and recruited 15% of Demola's students.

Interviewees see a significant advantage in the fact that Demola can facilitate all kinds of innovation projects, and that it is independent of specific thematic focuses of the city of Tampere and the regional council. The multidisciplinary nature of Demola is vital in addressing challenges presented by various partners, ranging from companies to public sector organisations and even NGOs. The student teams cover a large range of disciplines including technological science, life sciences and social sciences. The ongoing merger of the universities will probably further strengthen the multidisciplinary links and interactions.

Regional competence centres

In West Romania, a key measure meant to support advanced manufacturing, was the development of the regional competence centre for supplier development in the automotive sector. This project is implemented by the Timisoara city government and the West RDA, as part of the Growth Pact Timisoara programme, which was funded through the Regional Operational Programme 2007–2013. The Timisoara city government is the owner of the competence centre, but the West RDA and the automotive cluster have contributed substantially to the design of the project.

Timisoara's city government, together with West RDA, initiated the development of the competence centre with a view to developing infrastructure to provide the local Tier 1 and Tier 2 suppliers with opportunities for training their workforce, and for testing and product development of cooperative projects among companies in the automotive sector. An important component is the development of training sessions to help develop the

skills of the regional workforce in new fields needed by the automotive sector companies.

The centre has finished its investment phase (2012–2015), with its training platform being set up in 2017. It is still at an early stage, but the development of the centre is good practice related to the local authorities' and West RDA's strategic approach in response to the regional industry's needs for a trained workforce and product development spaces.

This practice is transferable to other regions hosting a large automotive sector (with a critical mass). It requires close involvement of the private sector, in both the design and implementation phases of the centre, to ensure the adequacy of the equipment for testing and training sessions to meet industry needs.

Good practices and conditions for transferability

The nine case studies allowed the extraction of a number of good practices in the area of policy governance, policy design, policy mix, and policy monitoring and evaluation, which may represent some level of interest for regions seeking to enhance their industrial policy capacities. Annex B presents 44 good practices identified across the 9 case study regions. The types of good practices, which provide strong industrial policy capacity, are quite varied. Some good practices relate to the use of specific tools or methods as part of the policy design, implementation and monitoring process, while others relate to approaches or specific processes used by regional policymakers or practitioners in formulating or implementing these policies.

As illustrated by the good practices outlined in Annex B, the conditions for transferability for each individual good practice vary significantly. However, the potential for the transferability of most good practices depends on the ability and discretionary capacity of regions to design and implement industrial policy initiatives. In other words, having a minimum level of competencies over industrial development is one of the key preconditions for any region to import or replicate any of the identified good practices. In addition to this, good practices can be classified into the following six categories (with examples), based on their conditions and potential for transferability.

Those that can be adopted in regions at any development phase or institutional setting (development and institutionally-neutral good practices): The umbrella regional structure ORES in the Pays de la Loire region, and the Open Innovation platform policy approach adopted in Pirkanmaa. However, certain good practices are extremely location-specific which, in turn, weakens their potential for transferability. This includes regional state agencies (*Landesagenturen*) implemented in Baden-Württemberg.

Those that require a high level of autonomy in economic and industrial policy: The social dialogue implemented in Catalonia.

Those requiring strong involvement of national or central governments in economic and industrial policy: The Growth Pacts in Pirkanmaa.

Those requiring the existence of a community of stakeholders with prior involvement in regional industrial policy development: Bottom-up policy coordination through Top Sector teams adopted in North Brabant. Another example is the Catalan cluster policy which requires regions to have a collection of naturally occurring clusters in specific economic or industrial sectors. Transferring such a good practice would also require the presence of pro-active companies, capable of taking on a strategic leadership role within sectors ('companies with tractive capacity').

Those that require the existence of technical skills and capacities within the host region: This applies particularly to good practices relating to specific technical or IT-related tools such as the QuESTIO tool or the Open Innovation platform, both adopted in Lombardy.

Those requiring strong financial commitments and investments: Certain good practices such as the technocampuses and regional innovation platforms in Pays de la Loire require financial investments. To a lesser extent, this also applies to the development of certain technical tools such as the LAPIS-Integrated Strategic Planning Workshop in Lombardy.

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Annex A: Good practice criteria

Policy process	Factors	Short description
Governance	Multistakeholder involvement	Active inclusion of and commitment by regional stakeholders and other national institutions in the design, implementation and funding of initiatives.
	Supporting the 'entrepreneurial discovery' process	The involvement of the private sector in the formulation of regional industrial modernisation strategies is important; this supports the 'entrepreneurial discovery' process and the selection of key sectors and clusters.
	Cross-institutional collaboration	Breaking policy silos and involving different regional/national ministries and institutions, establishing cross-institutional collaboration.
Policy design	Setting clear and transparent objectives	Clear objectives have been formulated for future-orientated/anticipatory policies and instruments for the manufacturing sector and related services.
	Focusing on specific regional characteristics	Taking into account the delivery mechanisms and content suitable for the target groups, in line with smart specialisation objectives, it is relevant to select clusters and cross-cutting topics that can be the basis for future industrial development.
	Adopting an integrated strategic approach	A system approach in policy is understood as one that combines horizontal policies with specific policies aimed at putting in place better infrastructure and better support for innovative companies. This provides them with a favourable business environment and addresses specific market failures to exploit service innovation.
	Balanced industrial policy design	Finding good balance in industrial policy: for example focusing on start-ups and the growth of existing companies; focusing on large companies and SMEs; and finding a balance between specialisation and diversification in the region.
	Interregional and international policy-learning	Consideration of developments in or outside the region (also across national borders) that (might) affect the region including EU initiatives.
	Capitalising on experience	Capitalising on previous experiences and policies, using the results of evaluations to adjust policies –avoiding absolute path dependency and learning from previous mistakes.
	Acknowledging and addressing policy trade-offs	Finding a good balance between short-term versus long-term objectives (including crisis situations, restructuring and resilience) and putting emphasis on different policy areas.
	Using policy intelligence	Conducting regional foresight exercises and related studies in the area of manufacturing and emerging industries can identify key opportunities and help better decision-making.
Policy mix	Practical skills enabling industrial change	Practical skills of the workforce are an important element in manufacturing priorities. For example, industrial PhDs (company-level education and training) and other measures can underpin industrial restructuring processes.
	Internationalisation	Providing support to the internationalisation of manufacturing businesses.
	Rapid deployment and up-scaling of advanced manufacturing technologies	Policy measures that foster the application of technologies and processes for the regeneration of existing manufacturing sectors.
	Digitalisation of manufacturing	Policies that support the adoption of KETs, such as in the area of digitalisation, can be instrumental in helping industrial modernisation.
	Green manufacturing	'Greening' developments in the regions, such as environmental innovation levels and their implementation to gain competitive advantage, are important aspects for industrial development.
	Service innovation and new business models as a source for industrial change	Service innovation can play an instrumental role in transforming the manufacturing sector and raise its value through new business models and solution-orientated approaches.
	Consideration of cross-sectoral and cross-cluster aspects	Cross-sectoral cooperation provides opportunities for development at industry boundaries and can be a source for innovation that helps create new value added for the industry.
	Adapting the financial mechanisms	Industrial change often requires the adaptation of financial mechanisms for the objectives of the specific emerging industry or transformation process that the region wants to achieve.
	Infrastructure	Existence of adequate infrastructure supporting advanced manufacturing processes.
Monitoring and evaluation	Systematic and objective monitoring and evaluation	Evaluation of strategies and instruments (before, during and after existence of counterfactual impact evaluation), resulting, if needed, in the adaptation of policies to achieve value added for the region (also in relation to cost effectiveness).
	Evaluation capacity	Existence of adequate skills, data and time resources for preparing and conducting regional industrial policy evaluations (or outsourcing them effectively).
	Indicator framework	Definition of a limited set of outputs, outcomes and impact indicators at the strategy and/or programme level.

Annex B: Detailed overview of regional good practice

Policy governance: Multistakeholder involvement

Industrial dialogue (Baden-Württemberg)

Industrial dialogue and stakeholder participation in strategy development is a specific brand of the industrial and innovation policy of Baden-Württemberg. It involves discussions with businesses, chambers of commerce, associations, trade unions and research, in the form of sectoral and thematic dialogues. Four action fields are organised: skilled workers; innovation and founding; location of industry; and bringing industry closer to people. This practice could be adopted in other regions, but it obviously requires a willingness to build the social dialogue between policymakers, business organisations and trade unions (considered as equal partners), and to build a shared vision on the future growth of the region. It may also require time to create such conditions for dialogue. Finally, it can only be transferred to regions enjoying a high level of autonomy (such as Catalonia and Lombardy), or a medium level of autonomy (Pays de la Loire and Pomorskie).

Social dialogue (Catalonia)

Catalonia has a long tradition of social dialogue. In the last 10 years, social dialogue has led to the signing of agreements for competitiveness and job creation between the Catalan government and economic and social stakeholders. This way of policy governance helped to involve a wide range of regional stakeholders in the decision-making process. In 2014, the government signed an Agreement for Permanent Social Dialogue with economic and social agents, primarily business representative associations and unions, with the objective of boosting the economic recovery and social justice. This agreement contained a set of urgent measures aimed at mitigating the effects of the financial crisis on employment, as well as improving the level of welfare and the survival of businesses. The social dialogue is based on a formal process of agenda-setting. This formal nature of conducting a dialogue with business representatives is transferable to regions that have a certain degree of autonomy in economic policy.

Independent forum (Lombardy)

Lombardy has created an independent forum composed of 10 international experts in R&I, aimed at fostering a public debate and agenda-setting process on the impact of science and technological innovations on the regional economic system.

This forum seeks to put in place the conditions for the involvement of different regional stakeholders in the agenda-setting process, including civil society representatives, the scientific community, representatives of the nine technology clusters and other regional innovation system stakeholders, by means of participatory methods and tools. By doing this, it promotes the exchange of views between different interests and provides useful information to the regional authority on establishing priorities and defining intervention strategies.

Preconditions for transfer include:

- the existence of regional legislative powers in R&D;
- a capacity to create participatory mechanisms;
- the existence of a community of stakeholders willing to engage in collective debate and discussions.

Growth Pacts (Pirkanmaa)

The government collects taxes, with part of it allocated to the cities. This allocation happens through the Growth Pacts, which includes a decision on the budget and a plan based on how the cities wish to spend the money. The cities are free to come up with their own policy development goals and support measures, but they are stress tested by the national level administration through this process. There are also national level objectives disseminated through the Growth Pacts, such as increasing the amount of public procurement for innovation.

As there is this coordination mechanism between the national and regional level, this would be transferable to regions in relatively small countries where the national level plays an important role.

Smart Specialisation Strategy (West Romania)

The RIS3 process for strategy and priorities' development received greater involvement by the private local stakeholders than in previous rounds, as it was focused on specific thematic groups of discussion. The formation of the RPC was organised and coordinated by the West RDA, and composed of representatives from the main public administration bodies at the regional, county and local levels (from the county administration, county councils, local governments and Growth Pact representatives) and external stakeholders, local public services authorities, local NGOs and the private sector (represented by the chambers of commerce, local clusters and individual local entrepreneurs). These stakeholders were organised in thematic working groups for the definition of development priorities.

Breaking policy silos and cross-institutional cooperation seems to have been a core principle of the initiatives developed by West RDA.

The practices of private sector engagement are transferable to regions in the early stage of defining innovation policies and intervention measures to support the innovation system. The regional agency developing the process should take ownership and develop good working relationships with the regional companies, thereby gaining their trust and engagement. In addition, the agency needs to ensure the transparency of the process and provide sound criteria for taking the companies' suggestions on board, as well as informing them of the final outcomes and the continuity of the process.

Policy governance: Multistakeholder involvement and supporting the EDP

An open interactive agenda-setting process (Lombardy)

This encompasses the example of the regional Smart Specialisation Strategy (S3), where the Regional Administration Authority oversaw the planning and the management of the drafting process of the regional strategy. A participatory process was defined to steer the strategy design, bringing together representatives from European and national institutions and ministries, regional agencies, universities and enterprises, based on the model of a quadruple helix. The participation mechanisms were managed by the S3 Steering Committee, which included representatives of the regional administration and regional economic development agency (Finlombarda). Finlombarda provide highly qualified technical expertise in the fields of business development, technological innovation and strategic planning.

Preconditions for transfer include the existence of:

- a regional dimension in the design of S3;
- a central committee or steering body to coordinate the process, which is accepted by other stakeholders;
- a community of stakeholders willing to engage in collective debate and discussions.

Bottom-up policy coordination through Top Sector teams (North Brabant)

Sector-specific roadmaps are developed by 'top teams' with representatives from industry, a researcher from a knowledge institute, a representative of the government, and an SME. These roadmaps provide action plans and agreements on a sector's development.

While the Dutch example provides a lot of flexibility in how to organise the Top Sector teams, jurisdictions that have a stronger say in steering policy could still adopt elements of those teams, while ensuring that government representation remains as strong as desired.

Different types of policy coordination mechanisms (Pays de la Loire)

These include informal policy coordination mechanisms through interpersonal relationships: the setting up of interinstitutional commissions gathering different types of stakeholders in order to provide critical analysis of new policies or expert advice on specific issues; and the elaboration of formal contracts between various stakeholders, whether institutional stakeholders or economic stakeholders.

Only formal policy coordination mechanisms are transferable. In order to be successful in implementation, the commissions that are set up should remain stable over the following years and be used even if different strategies are set up (for example, the definition of the smart specialisation strategy made use of the commissions that were set up for the definition of the economic development strategy).

Policy governance: Supporting the EDP

Companies as part of the policy capacity (Pays de La Loire)

This involves engaging companies in most parts of the policy design and implementation process. In order to be successful in the EDP, the policymakers need to identify key entrepreneurs/business CEOs in each regional sector who will participate in formal collaboration mechanisms. Companies can therefore channel policy information and engage other companies to participate in large consultations or surveys, if regional strategies are defined periodically. Key to the successful participation of companies is that they have an interest in their participation. To involve SMEs and larger regional companies in the financing of key measures through public–private projects is a way to ensure:

- the relevance of the action;
- an effective involvement in the definition of the policy.

Policy governance: Cross-institutional collaboration

Unitary programming (Sardinia)

Unitary programming consists of organising regular meetings at both the political and technical level in order to coordinate decisions on the main policy issues that affect multiple ministries. This new system can be considered a good practice since it allows the concentration of all the resources available at regional level, according to the policy priorities and objectives. Moreover, it significantly improves policy programming.

This good practice can be transferred to other regions with low levels of policy coordination that have important remits in industrial policies, and which manage multiple sources of funding. Strong political commitment and highly skilled personnel are required.

Policy design: Setting clear and transparent objectives and supporting the EDP

Industry 4.0 for Baden-Württemberg and Allianz Industrie 4.0 (Baden-Württemberg)

This is an initiative to encourage the uptake of advanced manufacturing solutions by industry. In 2014, the Ministry for Financial and Economic Affairs published a policy document called *Industrie 4.0 für Baden-Württemberg*, concluding that the region already had a high potential in advanced manufacturing and setting a clear framework for policy actions to achieve the transformation of the regional industrial base.

Following the production of the policy document, the Allianz Industrie 4.0 Baden-Württemberg was set up to intensify the exchange between industry and technology representatives, so that synergy potentials could be

developed within the region. The Allianz Industrie partners want to give priority to SMEs on the transition to Industry 4.0 and to help employees to work in a transformative manufacturing environment.

Preconditions for transfer include:

- the presence of a strong manufacturing sector;
- the presence of key manufacturing leaders (large companies) to raise awareness among SMEs about Industrie 4.0;
- awareness of the industry needs and involvement of trade unions for designing training programmes.

Policy design: Supporting the 'entrepreneurial discovery' process

RIS3CAT communities (Catalonia)

In 2013, Catalonia designed its own smart specialisation strategy based on its specific strengths, with a focus on activities with high levels of innovation and added value. The strategy was prepared following a wide consultation with industry allowing for a bottom-up approach. The strategy focuses on six cross-cutting 'enabling technologies'; advanced manufacturing technologies being one of them. Catalonia is considered as one of the major players internationally in the areas of photonics, lasers and 3D printing.

RIS3CAT communities have been created as voluntary associations of companies and stakeholders in the Catalan innovation system. These communities are an essential and innovative element of RIS3CAT. As active stakeholders in the Catalan innovation ecosystem, they ensure the participation of companies and stakeholders from the system in defining, monitoring and evaluating the priorities for R&I programmes. Their multidisciplinary profile and bottom-up focus make them leading players in the EDPs that lead to increasing specialisation, as they identify and generate projects related to specific topics in the leading sectors.

Regions implementing RIS3 strategies can adapt the process of business and SME involvement in policy design to their profile.

Involvement of industry and a smart but not 'specialised' approach (Pirkanmaa)

Companies are sought as partners in the strategy-making processes and in the implementation of the resulting strategies. The involvement of industry is mutual, meaning that it is not just policymakers who want to get companies on board to comment on strategies, but also the industrial actors in Pirkanmaa who are also active and keen on taking a role in regional development.

The formal participation of industry in policy design happens mostly through industrial representations and intermediaries, such as the chamber of commerce or DIMECC (an industry association). Industry is also well connected to other regional actors such as universities or the vocational schools.

Pirkanmaa does not consider smart specialisation as a matter of adopting a specialised approach to a selected list of themes or clusters. The region has moved away from this logic, instead it focuses on the regional ecosystem which allows innovation to emerge wherever local talent might drive new business development.

Preconditions for transfer include:

- the presence of a culture of public–private dialogue;
- the presence of thought leaders in the industry sector;
- a broad understanding of innovation that supports industrial renewal.

Competition-based approach to identify smart specialisation areas (Pomorskie)

The agenda setting of the smart specialisation strategy in Pomorskie has been unique in the sense that it was the only Polish region where an open competition for the identification of development areas around certain industries was published and a transparent bottom-up approach adopted. Pomorskie successfully applied a negotiation approach based on the participation and involvement of various partner institutions, entities and communities. Overall, some 400 entities have been involved in the process. The available financial resources have been an important incentive to ensure the participation of stakeholders.

The process of organising the competition in policy design is transferable to all regions designing smart specialisation strategies and where there is not yet a bottom-up approach in place for priority setting.

Policy design: Adopting an integrated strategic approach

Catalan cluster policy (Catalonia)

The Catalan cluster policy started in 1993 at a time of economic and industrial crisis, and while Catalonia was facing the challenge of a significant opening up of the economy. The underlying view was that existing industrial policy dedicated a great deal of its resources to boosting quality, productivity, innovation, exports, computerisation and design, and managed to improve companies' operating efficiency. More than 20 specific initiatives to strengthen competitiveness at microcluster level were set up in Catalonia between 1993 and 2004. These were developed as part of a largely non-interventionist industrial policy, which recommended strategies decided upon by the companies themselves, and offered support focused on opportunities rather than problems.

Preconditions for transferring the cluster policy concept and the internationalisation partnerships of clusters include:

- an existing collection in the receiving region of naturally occurring clusters in specific economic or industrial sectors;
- the presence of pro-active companies that can take a strategic leadership role within sectors ('companies with tractive capacity').

Integrated programming system (Sardinia)

Sardinia is endowed with a comprehensive regional development strategy that combines horizontal policies for improving the overall business environment, with vertical policies for supporting particular sectors identified through the RIS3 strategy. The overall strategy results from various policy documents that are tightly integrated with each other (the Regional Development programme and the S3 strategy are the most important ones), which cover relatively long time periods (five years for the Regional Development programme and seven years for the S3 strategy) and which are characterised by medium- to long-term objectives.

Preconditions for transfer include:

- the system of governance and the remit of the receiving region on development policies;
- significant expertise in the design and management of regional policies.

Policy design: Interregional and international policy learning

Participation in European level initiatives (Catalonia)

Catalonia's participation in European level initiatives is either direct or through projects in existing European level initiatives, such as Manunet, EFFRA, SPIRE and Clepa (automotive). Manunet is considered as having been a successful means of aligning interregional funding for advanced manufacturing. Catalonia secured 20 projects under the last call and considers the experience a success. Using such existing cooperation to identify interregional value-chains represents an important opportunity for the regional industrial base.

It is also involved in the Vanguard Initiative for New Growth through Smart Specialisation, which is an initiative for boosting new growth through bottom-up entrepreneurial innovation and industrial renewal in European priority areas such as advanced manufacturing. In fact, two pilot initiatives are being carried out in the fields of ESM (led by Catalonia, together with Lombardy) and High-performance Production with 3D Printing (Catalonia as a participating region).

Preconditions for the transfer for interregional experiences of cooperation to strengthen own industrial development include:

- a clear message from the regional government of the value of participating in these activities;
- sufficient dissemination of previous success cases and the results of interregional and international collaboration.

Regional involvement in European networks and initiatives such as the Vanguard Initiative for New Growth through Smart Specialisation (Lombardy)

The need to be connected with European networks and international partnerships has been highlighted by several interviewees as an essential condition to access European and international funding, but there is also a need to learn from other regions in order to inform the policymaking in the 'home' region. The regional authority administration has an EU office in Brussels that facilitates lobbying activities and the participation of regional actors in European programmes. Moreover, within the regional authority administration, its international affairs department is in charge of coordinating Lombardy's participation in European programmes and territorial cooperation – CTE (formerly Interreg). Lombardy has long been committed to interregional cooperation within the EU on this and is a member of several sectoral/territorial programmes and networks. In advanced manufacturing, the regional stakeholders have drawn extensively from EU-sponsored initiatives.

Preconditions for engaging in or following European level projects focusing on issues of relevance to the region include:

- English language skills within the regional administration;
- availability of resources (human and financial) to engage in international cooperation activities.

Baltic Sea Region (Pomorskie)

Pomorskie participates in the Baltic Sea Region initiative. The European Union Strategy for the Baltic Sea Region is the first macroregional strategy in Europe. It aims at reinforcing cooperation within this large region in order to face several challenges by working together, as well as promoting a more balanced development in the area. The strategy also contributes to major EU policies and reinforces the integration within the area.

Active participation in transregional initiatives is transferable to regions participating in a macroregional programme and sharing borders with other regions.

Policy design: Setting clear objectives

Regional development strategy (Pomorskie)

The Pomorskie regional development strategy is a very important document, setting out mid-term policy directions in line with long-term development goals. Regional stakeholders acknowledge the strategy to be especially successful in developing the regional industry base and in providing a clear vision and plan. They also consider that the strategic programmes responded correctly to the 2008 economic crisis. Pomorskie has been found to be especially resilient among the Polish regions. Its strengths lie in the diversification of production, the share of export of high-tech products and international embeddedness in global value-chains.

The regional development policy supported technological modernisation, human capital and stimulated entrepreneurship and is continually updated to reflect the latest policy directions.

Preconditions for transfer include:

- formulation of objectives by the receiving region;
- a medium level of autonomy in policy governance;
- the existence of regional dimension in the design of S3.

Policy design: Setting clear and transparent objectives and adopting an integrated strategic approach

Strategic Document for Industrial Policies 2013–2018 (Lombardy)

Lombardy has defined a clear-cut industrial policy, which has been identified and recognised by most regional stakeholders. The cornerstone of this policy is the Strategic Document for Industrial Policies 2013–2018, which sets out clear strategic objectives in industrial policy, and is accessible by the public. It adopts an integrated approach as it covers access to finance, technological development and innovation, and skills enhancement.

Regions wishing to adopt this practice need to develop an 'industrial policy' intervention logic and/or theory of change. They also need to increase the transparency of industrial policy objectives and communicate these to the public.

Preconditions for transfer include:

- the existence of regional legislative powers in industrial policy;
- political commitment to the industrial policy agenda.

Policy design: Focusing on specific regional characteristics

Regional smart specialisation strategy (Lombardy)

Regional smart specialisation strategy (S3) defines the key specialisation domains in relation to the key regional characteristics for the research, development and innovation regional policy. It is used to guide policy decisions and select target sectors, technologies and markets. The Smart Specialisation Strategy of Lombardy is a stand-alone document. The objectives identified in the S3 are embedded in the regional industrial strategy as a part of its R&I dimension.

Preconditions for transfer include:

- an available body of policy and economic intelligence, which can be used to identify key regional strengths (particularly compared with neighbouring regions);
- political commitment to the S3 process.

Policy design: Using policy intelligence

QuESTIO (Lombardy)

QuESTIO has been created to map the main regional scientific, technical and economic characteristics (research and technology transfer centres, technology clusters, businesses and existing research infrastructures) related to the seven areas of specialisation identified by the S3, plus main topics of Smart Cities and Communities.

Regions wishing to adopt this practice need to take advantage of IT tools to develop real-time monitoring platforms, and to allocate resources to monitoring as part of industrial policy design and implementation.

Preconditions for transfer include:

- technical capacities to develop, manage and maintain the monitoring platform.

Open Innovation platform (Lombardy)

The purpose of this instrument is to help the regional authority administration to monitor the changes of the RIS3 and to support the definition of technology roadmaps and tailored-made work programmes to support the transformations.

Regions wishing to adopt this practice need to take advantage of IT tools to develop real-time monitoring platforms, and to allocate resources to monitoring as part of industrial policy design and implementation.

Preconditions for transfer include:

- technical capacities to develop, manage and maintain the monitoring platform.

Umbrella regional structure ORES (Pays de la Loire)

This compiles and analyses a wide range of local and regional data from various regional observatories and is easily transferable. However, it requires different organisations that already collect data to work together to share and build a common set of data.

Policy design: Balanced industrial policy design

Comprehensive company support strategy (Sardinia)

As of 2017, Sardinia is endowed with a very comprehensive set of company support policies that vary according to a company's lifecycle stage, sector and size. Supporting innovative start-ups (especially in the ICT sector) represents an important priority for the regional government. For this reason, a specific subset of company support policies has been devoted to innovative start-ups.

Even though, in principle, this system could be exported to other regions, it would need to be adapted to the characteristics and policy objectives of the receiving region.

Significant expertise is required for the management of this complex system of policy tools.

Policy mix: Rapid deployment and upscaling of advanced manufacturing technologies

Regional state agencies – Landesagenturen (Baden-Württemberg)

The recently established regional state agencies are the state's central point of contact and advice for all aspects related to technological change in new industries with high-growth potential. They support universities, research institutes, companies, networks, and municipalities in order to successfully shape the technology exchange in emerging sectors and new fields of industrial development. These institutions are seen as key to break industrial path dependencies.

This good practice is very location-specific and also needs a stable funding and institutional framework for development agencies. Despite this, any region can take inspiration from looking at the concrete activities of these regional agencies.

Technocampuses and regional innovation platforms (Pays de la Loire)

This involves developing technology and R&D platforms accessible to regional actors (including SMEs) in order to favour the upgrade and modernisation of productive capacities.

As it requires massive investments, preconditions for transfer include ensuring:

- co-funding between various public authorities is managed;
- the private sector is also engaged in the co-funding.

Open Innovation platform policy approach (Pirkanmaa)

At regional and local level, the main type of policy instrument to implement the economic policy objectives is the support to industrial and innovation platforms. This comes from the general policy goal to create an open and collaborative business environment, on the basis of which industries can innovate, reinvent themselves and face global competition. This is also in line with the recent policy shift towards a 'platform-based' policy approach. However, it is contrary to traditional cluster policies where the focus was put on cooperation between companies and research organisations, and on fostering research and innovation projects; the platform approach stresses the importance of communities, talents and global ecosystems. Several of these platforms, such as the Smart Machines and Manufacturing Competence Centre, foster the development and adoption of advanced manufacturing technologies and solutions.

Elements of the concepts of open innovation platforms as a specific policy instrument, and the Smart Machines and Manufacturing Competence Centre, are transferable to any type of region.

ROSENC Cluster (West Romania)

The ROSENC Cluster developed its own concept of innovation brokerage for sparking collaborative innovation projects. The cluster offers the space for idea generation and for building trust and relationships for deeper cooperation. Moreover, the cluster team supports the identification of suppliers of materials and potential resources in-kind to the team that decides on building a new product. Based on this, the contributors are rewarded through participation in the rewards of the developed product in case the technology developed is successful. This cluster is considered good practice within the Romanian context due to the fact that there are few documented examples of successful innovation process management in other Romanian clusters, and their process can be replicated. There is also an element of innovation process management and the process is transferable to other regions with recent cluster policies.

A precondition for effective transferability is the existence of a trustworthy cluster manager or innovation broker in the region, who acts as a point of contact between the different innovation stakeholders, spotting development opportunities and matching them with the right actors.

Policy mix: Consideration of cross-sectoral and cross-cluster aspects

Support for Fieldlabs (North Brabant)

Fieldlabs are shared facilities where companies and research institutions develop targeted solutions for both testing and implementation. They also strengthen links with research, education and policy on specific themes. Some have a regional focus; others a national or even European focus.

Shared facilities with support from stakeholders should be fully transferable to any region if stakeholders have a sufficient stake in the facility.

Policy mix: Practical skills enabling industrial change

Demola Tampere (Pirkanmaa)

Demola is an international organisation that facilitates co-creation projects between university students and companies, either locally or internationally. It is a network that consists of various partners including universities, their faculties, researchers and students, as well as companies and local agencies. With a growing number of Demola centres around the world, it is both international and interdisciplinary.

The Demola approach has already been implemented in a range of other countries and regions and is transferable to regions with a strong university base.

Vocational curricula (Pomorskie)

The regional government supported the development of curricula in vocational education that addresses the needs of regional companies (both manufacturing and

other) in fostering skills on digital technologies, advanced manufacturing and languages. The curricula were launched at subregional level and are considered to be a pro-active step in adjusting to the region's needs.

The new curricula and pro-active process are transferable to regions where national authorities have the power to decide education policy and want inspiration on how to lobby for regional interests.

C-Lab (Sardinia)

The C-Lab aims to improve business culture and to boost entrepreneurship among its participants (about 100 graduate students per year). In order to achieve this objective, participants are encouraged to work together in groups and in joint projects. They can rely on both university facilities and the expertise of university tutors and researchers. Learning does not take place through formal teaching but through contact and collaboration.

This good practice can be exported to regions whose development strategy aims to boost innovative start-ups. The presence of a university (willing to experiment with non-traditional collaborative teaching techniques) and of a favourable business environment are required.

Regional competence centre for supplier development in the automotive sector (West Romania)

The local government body of Timisoara, together with the West RDA initiated the development of the competence centre with a view to developing infrastructure for testing and product development for cooperative projects among companies in the automotive sector. An important component is also the development of training sessions to develop the skills of the regional workforce in new competencies needed by companies in the automotive sector.

The centre has finished its investment phase (2012–2015) and is performing the operationalisation and setting up of the training platform. It is still at an early phase, but the development of the centre is good practice related in response to the regional industry's needs for a trained workforce and product development spaces.

The focus on skills development for advanced manufacturing is a useful practice to transfer. Preconditions for transfer include:

- a thorough analysis of the skills needs in the region;
- involvement of the private sector in the definition of the solutions.

Policy mix: Service innovation and new business models as a source of industrial change

One-stop shop for business (Sardinia)

The one-stop shop for business consists of a centralised, standardised and computerised system to provide public services to local companies. This new system makes life easier for local companies and improves the attractiveness of Sardinia for companies from other regions.

This good practice can be exported to other regions characterised by excessive red tape and unfavourable institutional environments for business. Significant adaptations might be required, depending on how the remits in business services are divided among the different tiers of government in the receiving region (such as regional government and municipalities).

Policy mix: Infrastructure

Technological park Polaris (Sardinia)

The technological park Polaris was created in the 1990s and has consistently received regional financial support. This investment in research infrastructure has allowed the development of an important business cluster in the ICT sector.

However, this good practice cannot be easily exported elsewhere, especially to less developed regions whose companies lack absorption capacity of new technologies.

Policy mix: Adapting financial mechanisms

Financial engineering instruments (Sardinia)

Financial engineering instruments are revolving funds and have been introduced to compensate for the unwillingness of local banks to lend money to local companies. Moreover, by leveraging private investments, they represent an answer to the drop in available public resources.

The Sardinian experience in the design of innovative financial engineering instruments can be exported to other contexts that experience similar problems, particularly a lack of bank credit and public resources.

Attention should be paid to the local economic structure and to the administrative capacity of the offices to be entrusted with the management of these financial instruments.

Policy mix: Cross-sectional and cross-cluster aspects

Tehimpuls Centre (West Romania)

The West RDA developed the innovation ecosystem of the region. It founded the Tehimpuls Centre supporting innovation in SMEs – as a partnership between several actors of the innovation system, including universities and companies. The Tehimpuls Centre can be called a policy innovation that is functioning as a centre for innovation management support, facilitating the networking of innovative companies and awarding innovation through the annual InnoMatch Regional Innovation Fair. The centre served as an important channel for new entrepreneurial potential during the regional strategy development process.

A sound regional innovation strategy is a prerequisite for the good functioning of such a centre, as well as, ideally, funding allocated in line with the RIS. It could be transferable particularly to other regions in central-eastern Europe as the concept of the centre (including its intention to foster cooperation among local actors and create an environment that is conducive to innovation) is not widespread there.

Monitoring and evaluation: Monitoring

Monitoring Catalonia 2020 (Catalonia)

The Catalan government publishes monitoring indicators on the government's website and holds annual monitoring and evaluation meetings at the highest representative level among the signatories related to the Catalonia strategies. An independent system of monitoring indicators is provided.

The monitoring frameworks need to reflect the needs and aspirations of each region. This particular monitoring framework draws heavily from the ideas behind Europe 2020. Other regions can take a similar approach to align themselves with the overarching EU objectives.

Monitoring and evaluation: Systemic and objective monitoring and evaluation

LAPIS-Integrated Strategic Planning Workshop (Lombardy)

LAPIS works as an operational database allowing for the storage of specific information on all of the regional authority's administration initiatives. It informs decision makers about the effectiveness, the results and the consistency of the regional policies and programmes, such as providing constant data on the achievements against the expected outputs. An important feature of this tool is the ability to share information among all of the 14 General Directorates and regional agencies within the RAA, meeting the government requirements of a shared and cross-cutting vision of the regional initiatives.

Preconditions for transfer include:

- taking advantage of IT tools to develop real-time monitoring platforms;
- allocating resources to monitoring as part of industrial policy design and implementation.

Regionally focused innovation scoreboard (North Brabant)

This scoreboard provides an annual breakdown of statistics of innovation policies on indicators such as R&D spending, value added in goods, the number of companies and personnel issues. Importantly, these figures are publicly available.

This practice is easily transferable, especially when the scoreboard is limited to the borders of a single Member State.

Monitoring and evaluation: Policy intelligence also used as a monitoring tool

Situational Picture of Innovation (Pirkanmaa)

In 2012, the regional council established a new monitoring tool – the Situational Picture of Innovation – to strengthen the evidence-base of policymaking. The rationale behind this policy tool was the awareness of the need for well-grounded policy intelligence and better data and indicators about the performance of the regional economy. This can give a stronger feedback to policymakers on how the regional economy is doing, which policies might work and what new policy interventions to select.

The picture is a structured and pro-active information management process, produced annually, through which signals of change in innovation are identified, and a joint interpretation by the region's actors is created on their significance to the region's development and future.

The tool and its indicator framework are transferable to regions with relevant innovation activities.

Pomorskie system of monitoring and evaluations (Pomorskie)

This system integrates and coordinates the activities of monitoring and evaluation conducted by the regional Pomeranian government, and through cooperation with many organisations and institutions involved in the development of the region.

The monitoring framework is transferable to regions with a similar governance system and high dependence on ESIF.

This overview report synthesises and compares industrial policy capacity within nine European case study regions which have been analysed as part of the pilot project Future of Manufacturing in Europe. The regions analysed are industrial and manufacturing powerhouses of their respective countries and it is clear that, in the majority of them, industrial policy is strongly linked to regional innovation. This study was designed to identify good practices in order to further develop regional industrial policy capacities across regions in Europe. Many of these good practices – in policy governance, policy design, policy mix, or policy monitoring and evaluation – may interest regions seeking to enhance their industrial policy capacities.

The European Foundation for the Improvement of Living and Working Conditions (Eurofound) is a tripartite European Union Agency, whose role is to provide knowledge in the area of social, employment and work-related policies. Eurofound was established in 1975 by Council Regulation (EEC) No. 1365/75, to contribute to the planning and design of better living and working conditions in Europe.

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