Innovation policy mix for Advanced Manufacturing

Comparative summary baseline study: Basque Country, Lithuania, Piedmont, Wales

Orkestra – Basque Institute of Competitiveness
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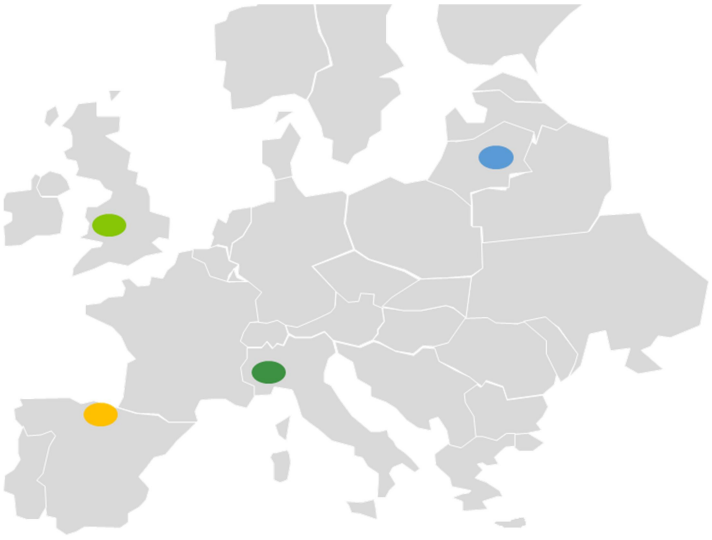
1. Introduction

This report has been elaborated as part of Manumix Interreg, a project that aims at strengthening and improving the effectiveness and efficiency of innovation policy-mixes for Advance Manufacturing (AM) at regional level through evaluation. The project is developed in partnership by governments and institutions in the Basque Country, Lithuania, Piedmont and Wales. Specifically, the consortium of the project is composed of the Basque Government, MOSTA – Lithuanian Higher Education Monitoring and Analysis Centre, FinPiedmont and Welsh Government.



The first phase of the project includes the development of a baseline study to analyse the innovation policy mix of partner regions, its governance and evaluation practices. One report has been developed for each region, as well a general comparative study. These documents have been elaborated by Orkestra with active collaboration and involvement of partner regions, by providing the core information that is summarized in the baselines studies. The studies have been elaborated based on secondary sources, interviews with partner regions representatives and/or other stakeholders, a survey filled by policymakers and a survey filled by the programmes' beneficiaries (in Piedmont and Basque Country). In the case of Basque Country, an additional workshop with beneficiaries has been carried out.

This report reflects the comparison of the individual reports developed for each region, which show with greater depth and detail the specificities of each region. As the report shows, the different regional contexts and their related challenges have led to different understandings of Advanced Manufacturing and different approaches to innovation policy mixes, which at the same time has implications for evaluation practices. Understanding the different needs and approaches of each of the regions constitute the base for the learning on different dimensions of evaluation of policy mixes that is planned for the next phases of the project.

The report is structured as follows. Section 2 presents a general overview regional innovation and institutional contexts. Section 3 defines the scope of the AM strategies of each of the regions. Section 4 delves into the innovation policy mixes for AM and the selected policy-mixes for Manumix. Section 6 withdraws evaluation practices for AM strategy and the policy-mix. Finally, Section 7 concludes with a brief summary.

2. Regional contexts

The Basque Country, Lithuania, Piedmont and Wales have different features in institutional, social and economic terms, which stablish different approaches and focus to innovation policy-making in general and to RIS3 strategy in particular.

Regarding economic structure and innovation performance of regions, Basque Country and Piedmont have a long industrial tradition; the former specialized in medium to high technology manufacturing industries, the latter with a strong specialization in the automotive industry. In Wales, although agriculture has a strong share of the economy and there has been an increase in services, manufacturing still has quite a relative weight. Moreover, it has evolved from traditional heavy industry towards a high-tech focused industrial fabric. Lithuania has also experienced a shift in the last decades from traditional sectors such as agriculture and mining to service industries.

As shown in Table 1, Basque Country and Wales are strong innovators according to the Regional Innovation Scoreboard. These regions also rank in the middle-up group in the European Quality of Government Index, which measures citizen's perception about the quality of the public sector. Lithuania and Piedmont are considered moderate innovators, although both regions had a positive evolution in the last years.

Table 1. The four regions according to Regional Innovation Scorecard and European Quality of Government Index

Regions	Regional Innovation Scorecard 2017			Rank in European Quality of Government Index (2013)
	Category	Main Relative strenghts	Main Relative weaknesses	
Basque Country	Strong innovator	• tertiary education • innovative SMEs collaborating with others • sales of new-to-market and new-to-firm innovations • lifelong learning	• non-R&D innovation expenditures • European Patent Office (EPO) patents • marketing or organizational innovations • design applications	100
Lithuania	Moderate innovator	• innovation-friendly environment • human resources (tertiary education) • linkages (Private co-funding of public R&D expenditures and innovative SMEs collaborating with others)	• sales impacts • attractive research systems (foreign doctorate students adn most cited publications) • Intellectual assets (Design applications and PCT patent applications).	179
Piedmont	Moderate innovator	• R&D expenditures in business sector • SMEs innovation in house • Employment in knowledge intensive activities • Most cited scientific publications	• Terciary education • Innovative SMEs collaborating • R&D expenditure public sector • Lifelong learning • International scientific co-publications and public-private co-publications	182
Wales	Strong innovator	• lifelong learning • innovative SMEs collaborating • citations in scientific	• R&D expenditure, both at the public sector and business sector but with a	107

		publications	higher incidence on the last one	

Source: own elaboration based on individual baselines

On the other hand, some of the regions have a longer history than others on defining and implementing policies for economic development and innovation. Whereas for the Basque Country and Wales the RIS3 strategy is a natural extension of historical policies in this area, the innovation policy history of Piedmont is more recent. As for Lithuania, RIS3 has been a cornerstone in stablishing a clear strategic focus to a more recent innovation policy history.

The challenges that each of the regions face related to innovation policies vary from one to another, according to their socio-economic and institutional contexts. The Basque Country faces challenges with regards the effectiveness of the regional innovation system, which needs to improve its impact on the innovation outputs and also the connectivity among the different agents within the system. Institutional fragmentation and lack of coordination, fostering science and business collaboration and increasing business investment in innovation, skills mismatch, strengthening firm's innovation capabilities and access to financing innovation can be regarded as some of the main challenges of Lithuanian's innovation policies. As for Piedmont, the challenge is to support and accelerate a process of transforming industry through research and innovation policies into selected areas of innovation and addressing new needs by investing and consolidating the skills in the health and well-being of citizens. In Wales, the size of the companies, their low investment in R&D, their position in global value chains and dependence of European funds are the main challenges for regional innovation policy in general and advanced manufacturing in particular.

Linked to their innovation policy frameworks and governance arrangements, partner regions have developed context-specific processes for the development of their RIS3. However, following EU guidelines, all regions have involved regional stakeholders in different stages of the definition and implementation of their RIS3, strategies that have been built on the basis of the analysis of current research and productive capabilities and future potentials of the regions.

The specialization strategies share a common goal of producing a more knowledge intensive and high-added value industrial activities. Nevertheless, this general goal is translated in different specific objectives; as it is reasonable taking into account the different contexts and challenges that regions face. The specific objectives and the priorities defined in each region are presented in Table 2. As the table shows, there is a predominance of priorities related to EU priorities of Public Health and Security, KETS, Digital Agenda and Sustainable Innovation in the regional strategies. Among them, Advance Manufacturing is one of the priorities that all regions share, although as it will be presented in next section, the four regions approach and understand this priority in different ways.

Table 2. Overview of RIS3 priorities of partner regions and their correspondence with EU priorities

Region	RIS3 goals	Priority	EU Priority									
			Public Health & Secur.	KETS	Digital Agenda	Cult. & creative ind.	Sustainable in.	Social innov.	Service innovation	Local policy priority	Blue growth	Aeronautics and space	Nature and bio.
Basque Country	1)Concentrate expenditure on R&D&I to boost job creation and ec. reactivation; (2) Balance research activity (3) Increase efficiency level of Basque Science, Technology and Innovation system through the development of an integrated evaluation and monitoring system; (4) Internationalise R&D&I activity to capture+generate knowledge; (5) Increase the number of companies with innovation activities	Sustainable energy					■						
		Urban Habitat											
		Biosciences-Health	■										
		Advanced Manufacturing		■									
		Environmental Ecosystems					■						
		Cultural and Creative Industries				■							
		Food								■			
Lithuania	(1)create innovative technologies, products, processes and methods to respond to global trends and national challenges; (2)increase competitiveness of Lithuanian companies and opportunities for establishing in global markets–commercialization of knowledge created in the implementation of the R&D and innovation priorities and using the unique synergy arising from the collaboration of science and businesses, economic entities and other public and private sector entities.	Energy and sustainable environment					■						
		Health technologies and biotechnologies	■										
		Agricultural innovations and food technologies											
		New production processes, materials and technologies		■									
		Transport, logistics and ICT			■								
		Inclusive and creative society											
Piedmont	(1) valorising the work done by innovation centres and technological platforms so far; (2) concentrate investments in excellence fields; (3) adopting a real NETWORK approach and; (4) promoting SMART, SUSTAINABLE and INCLUSIVE growth.	Aerospace										■	
		Chemicals		■									
		Automotive											
		Made in Piedmont: textile & fashion, food, style & design											
		Mechatronic											
		Life Sciences	■										
Wales	To recognise Wales' strengths and define future research and innovation priorities	Low carbon energy. Smart Living. Eco innovation					■						
		ICT trust and cyber security			■								
		Wound healing.Neuroscience.Medical dev	■										
		e-health. Health informatics			■								
		Drug discovery											
		Food security	■										
		Advanced materials.		■									
		Materials evaluation and testing											

Source: Own elaboration based on information from S3 platform: http://s3platform.jrc.ec.europa.eu/

3. What is Advanced Manufacturing in Manumix partner regions?

According to the S3 platform data, 2 of 3 European regions have chosen a R&D priority related to industrial modernization. Indeed, industrial modernization is also a goal shared by all four Manumix partner regions.

However, specific challenges that AM strategies aim at contributing to solving vary from region to region. Lithuania's AM strategy aims at promoting intersectorial, international and businesses-research collaboration and partnertship and tackling the Lithuania's businesses low productivity levels that affect several sectors and industries. The Basque Country pursues maintaining the industrial character of the Basque economy by fostering higher value-added manufacturing activities helping Basque companies move towards more knowledge- and technology intensive activities. In Piedmont advanced manufacturing plays a key role in the new innovation strategy. The evolution of the engineering industry and related sectors in recent years has given a strong push to product diversification, with adaptive and flexible solutions that enable Piemonte to cope with the extreme variability of the markets and demand, by configuring an advanced manufacturing system both vertical and horizontal to the industrial sectors of Piemonte. As for Wales, leveraging innovation within firms, particularly SMEs, anchoring key regional firms, prioritise knowledge exchange and commercialisation of R&D, favouring a demand led approach are the main challenges to be addressed.

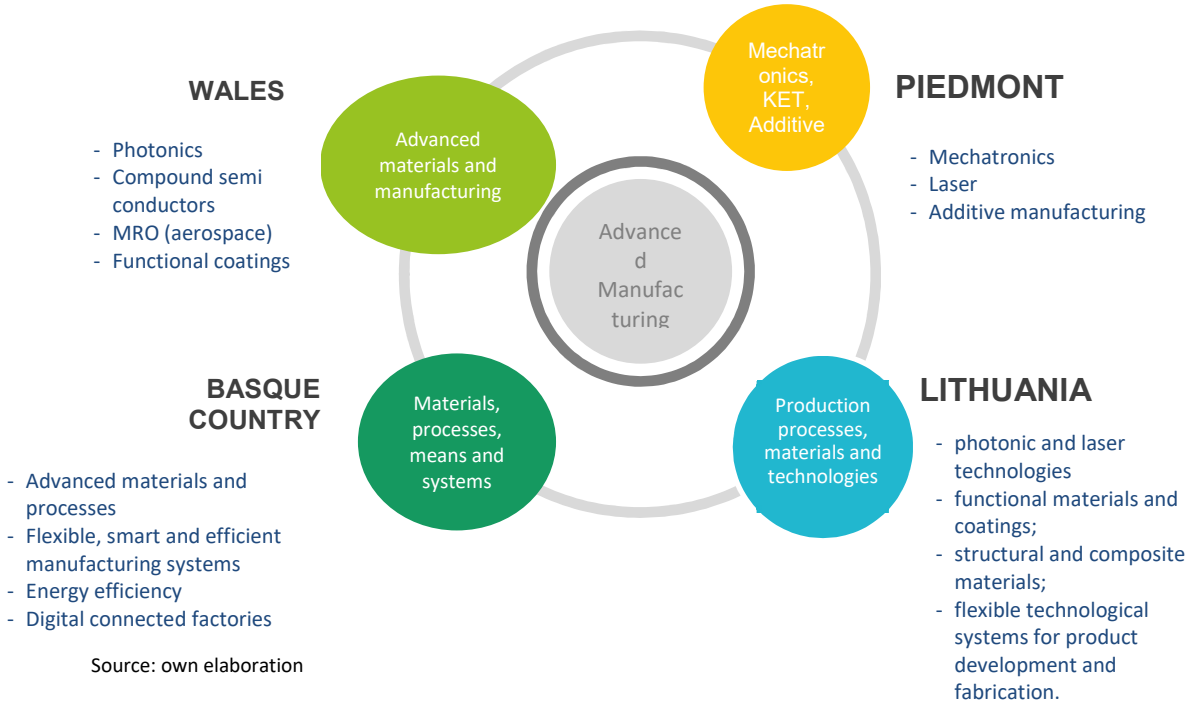
Table 3. Main challenges and/or objectives of AM strategies of Manumix partner regions

	Main challenges/objectives AM aims to responding
Basque Country	• To help and guide Basque companies towards more knowledge intensive manufacturing activities which have greater added value • Integration of KETs: to promote multi-disciplinary and technological convergence in a structured fashion so as to develop best-in-class manufacturing capacities and solution • Global value chains: to integrate local and international value chains to meet challenges of Advanced Manufacturing using the sum of the particular capacities of each sector and its companies • Scaling up: to foster collaboration as a catalyst for the industrialization of the results of R&D in AM • To support education and job training in technologies and management systems related to AM
Lithuania	• underused scientific capacity and a lack of collaboration between business and science • the low productivity of Lithuania's businesses; • a lack of advanced technologies, innovative processes, products and services • the need to increase the supply chain's efficiency by reducing costs; • the need to increase supply chain's efficiency and synchronization in order to ensure flexibility; • a shift from mass production to mass adaptation; • the need to shift to more profitable parts of the value added chain, focusing on international markets, on offering and increasing the share of high-technology industry.
Piedmont	• maintain developed excellent skills in their integration, often coming to form complete production industrial supply chains • to cope with the extreme variability of global markets and demand • enhance product diversification, with adaptive and flexible solutions
Wales	• globalisation – increasing trade, export and inward investment opportunities from existing and emerging markets

	• innovation and technology – encouraging and supporting Research and Development in innovative products and processes to increase and embed 'intellectual capital' in Wales • employment – 'future proofing' education, skills, training and leadership to meet the demands of the 21st century manufacturing workplace • finance for growth – syndicating risk-sharing financial packages through a combination of public and private sector funding mechanisms • building capacity - targeting investment in strategic infrastructure and broad-access initiatives that together create a sustainable business environment.

Besides, Advanced Manufacturing is a broad concept that includes different technologies and domains, also in Manumix regions. As it has been shown in Table 2 in Section 2, in Basque Country and Lithuania AM (framed under KETs priority in EU priority codes) corresponds to specific regional priorities. In Wales two priorities are linked to AM, whereas in Piedmont it is a transversal domain related to several of the regional RIS3 priorities, mainly with mechatronics. Regardless of the specificities, in all regions AM is multi-technological and cross-sectorial and as shown in Figure 1, it is related to materials and processes.

Figure 1. Advance Manufacturing in Manumix partner regions



Source: own elaboration

The AM strategies of Manumix regions are mainly governed through the governance mechanisms created for RIS3 strategy definition, implementation and evaluation. Regarding the governance of RIS3, all regions have put in place entrepreneurial discovery processes with wide stakeholder involvement as stated in Section 2. Moreover, besides the already existent governance structures for innovation policy making, the partner regions have also created specific intra-government and beyond-government governance bodies and processes for RIS3 development. Thus, there are specific intra-government coordination bodies such as the Basque S&T&T governance structure and the inter-ministerial S3 Team in Piedmont, and governance processes or structures that involve stakeholders, such as the Lithuanian Smart Coordination Group or the Welsh Innovation Advisory Council. In contrast, there are few AM

priority-focused governance structures and processes, one exception being the Basque AM Steering Group, which with a complex structure that involves public and private stakeholders, is key in the implementation of the AM priority.

Stakeholder involvement in RIS3 and/or AM strategy is achieved in partner regions through different mechanisms such as the EDP process and working groups (e.g. Basque AM steering group), at steering level (the Steering Committee in Piedmont) and at strategic level (Strategic R&I Council in Lithuania). Despite the stakeholder involvement, leadership of RIS3 and AM strategy is strongly concentrated in the governmental level in all regions, both at strategical and executive functions. However, this governmental leadership is in most of the cases distributed among different ministries and agencies.

To summarise, AM is focused on the development of different technologies in partner regions, which aim at responding at different regional challenges within a general frame of industrial modernization. The strategy is developed through already existing innovation policy governance mechanisms and ad hoc governance bodies created for RIS3 development. Those different approaches to AM that respond to general regional challenges are translated, as described in the next section, in policy-mixes with different focus and combination of policy instruments.

4. Innovation policy-mixes for Advanced Manufacturing

Policy instruments or policy tools can be defined as "the actual means and or devices governments have at their disposal for implementing policies, and among which, they must select in formulating policy" (Howlett and Ramesh, 2003). Indeed, the AM strategy as every other governmental strategy introduces instruments or tools as policy means, in order to achieve strategic goals. Hence, as the goals of innovation policy, the RIS3 strategy and AM strategy vary in each of the Manumix regions, so do the policy mixes designed to accomplish them.

Instruments can be divided between (i) regulatory instruments –legal tools which are obligatory in nature and aim at regulating interactions; (ii) economic instruments that provide economic incentives for promoting specific activities; and (iii) soft instruments, voluntary and non-coercive tools that make normative proposals (Borras and Edquist, 2013).

Type of instrument					Multi-level governance
Region	Economic	Regulatory	Soft	Specific instruments for AM?	
Basque Country	✓	✓	✓	✓	✓
Lithuania	✓	✓	x	x	x
Piedmont	✓	✓	✓	✓	✓
Wales	✓	✓	✓	✓	✓

The policy mix for AM in the Manumix regions is composed of a wide range of instruments, but there is a high predominance of economic instruments. Besides, with the exception of Lithuania, where the policy mix is exclusively composed by horizontal instruments, Manumix regions do have specific instruments targeted to Advanced Manufacturing. It has to be

underlined however that some degree of verticalization also exists in Lithuania's policy mix, since specific budgets have been assigned to RIS3 priorities within the horizontal instruments.

On the other hand, again with Lithuania's exception -being a country in which the competence for innovation policy relies at national level-, there are instruments from different territorial scales (subregional or supraregional) that operate at the partner regions for promoting AM. In Wales and Piedmont this multi-level instruments is mainly with national government, whereas in the Basque Country the sub-regional level has also a special role.

As for the policy mixes selected by partner regions for the Manumix project, their main features are presented in Table 4. As it can be seen, all regions have a strong focus on direct economic instruments such as loans and grants. On the other hand, whereas Lithuania's policy mix is oriented to research institutions, the policy mixes of the rest of the regions have a business orientation, specially –although not exclusively- targeting SMEs. Besides, all the policy mixes try to cover high Technology Readiness Levels (TRLs) in order to address the AM challenges. Lastly, as previously mentioned, all instruments have a degree of directionality towards fostering AM related activities, in some cases through horizontal instruments, at some cases, with vertical instruments.

Table 4. Main features of the policy mixes selected by Manumix partner regions

Features of the policy mix	Basque Country	Lithuania	Piedmont	Wales
Beneficiaries	Business-oriented policy-mix (mainly SME) (also emphasis on R&D collaboration)	Research institutes and universities oriented policy-mix (also firms are beneficiaries)	Business-oriented policy-mix (mainly SME)	Business-oriented policy-mix (mainly SME)
Types of instruments	Predominance of direct instruments (e.g. grants for R&D projects) and economic instruments	Predominance of direct instruments (i.e. grants)	Predominance of direct instruments (e.g. grants for collaborative R&D projects) and linkage instruments.	Predominance of direct instruments (e.g. grants for collaborative R&D projects) and economic instruments (except PPI)
Objectives/TRLS	Different and complementary objectives, covering a whole range of TRLs from TRL 3 to TRL 7)	Different and complementary objectives and try to cover high TRLs (commercialisation of R&D)	Different and complementary objectives. Aim at supporting the whole process, but the TRLs that cover four of the programmes are the same (from TRL 4 to TRL 7)	Different and complementary objectives and cover from R&D to commercialisation activities
Others	Combination of horizontal instruments with instruments specially	Horizontal instruments but advanced manufacturing is one	Combination of horizontal instruments specially aimed at	Combination of horizontal instruments although AM is a

	aimed to Advanced Manufacturing.	of the selecting criteria. High dependence of EU funding	the R&D collaboration domain with instruments specially aimed to Advanced Manufacturing Some instruments implemented through Ministerial Agreements (multi-level approach)	priority area that is prioritised High dependence of EU funded and some links with national instruments (PPI-SBFI)

Source: own elaboration

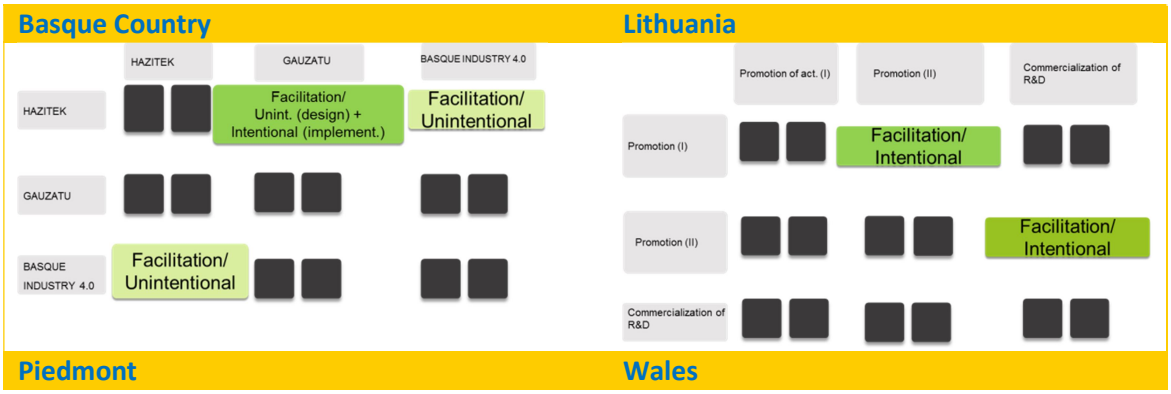
Nonetheless, a policy mix is more than a portfolio of instruments, since it includes the interactions between the different tools operating in a portfolio, or even in a policy space (Nauwealers et al, 2009, Magro and Wilson, 2013).

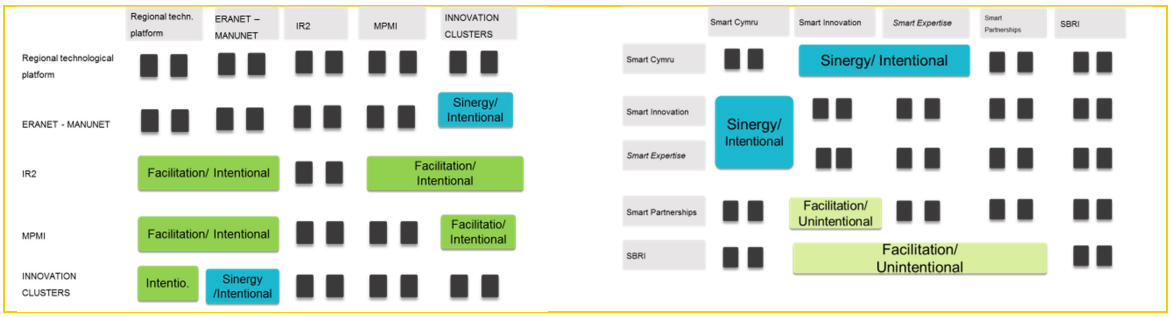
> ***An innovation policy mix refers to "the combination of policy instruments, which interact to influence the quantity and quality of R&D investments in public and private sectors"***
> ***(Nauwealers et al., 2009)***

Following Taeihag et al. (2013) five types of relations can be differentiated between policy instruments: Precondition is a direct relation which implies that one instrument must be implemented in order to other instrument to be successfully implemented. Facilitation refers to the relation in which the implementation of one instruments makes the implementation of another instrument to work better. Synergy is a bi-directional type of facilitation. Potential contradiction happens when there is a possibility of one instrument having conflicting outcomes in regards to other instrument in specific conditions. And finally, a contradiction exists where the conflicting outcomes are not only a possibility but a reality.

With regards to the Manumix innovation policy mixes, they all look for some intentional effects among the different instruments, with a high predominance of the facilitation type of relationship as shown in Figure 2. However, in Piedmont and Wales there are also instruments with a synergetic relation. Sinergy has not in all cases been intended in the design of the instruments but has emerged in their implementation. In fact, a general feature of the policy mixes is precisely that the interactions of the instruments have not always been planned and made explicit in the rationale of the policy mixes, leading to unintentional effects.

Figure 2. Types of interacions between instruments of policy mixes selected for Manumix





Source: own elaboration

As regards to the governance of the policy mixes for AM, Table 5 presents a general overview of main features of the governance of the whole policy making process of individual instruments and the coordination of the policy mix. Although the processes of each region are context-led, in all the regions there is some degree of stakeholder involvement either in the design, implementation or evaluation stages. In most of the cases the same agency is responsible for all instruments of the mix although there are different ministries involved throughout the process.

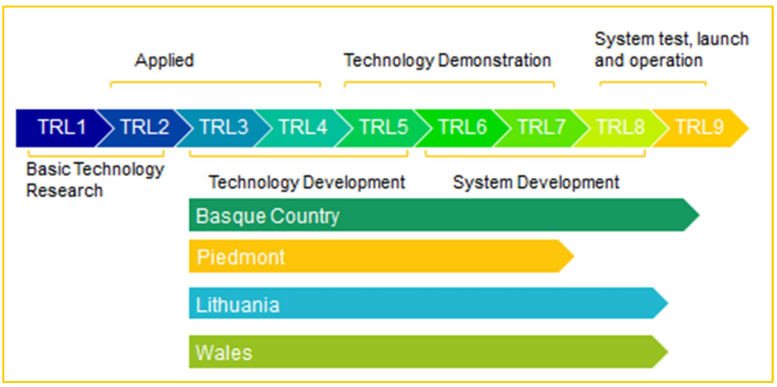
Table 5. General overview of governance of policy mix for AM in partner regions

Stages	Basque Country	Lithuania	Piedmont	Wales
Design of individual instruments	Regional Government with support of SPRI.	Two Ministries involved Discussed with satekhoderls Joint committee of various public and social partners to defined selection criteria	One Minister with support of Development Agency (FinPiedmont) Stakeholder involvement through RIS3 and ERDF working groups Pilot with National Ministry	Welsh Government/Business Wales or Innovate UK/ Central Government
Implementation	Regional Government with support of SPRI.	Same agency administrates the calls (CPVA)	One Minister and the Development Agency (FinPiedmont) Other stakeholders involved	Welsh Government/Business Wales/WEFO as instrumental body of Welsh Government
Evaluation of individual instruments	Evaluation developed by SPRI	Developed by administering agency with help of external experts Evaluated within the RIS3 evaluation system by external experts (MOSTA) and ministries	Evaluation developed with by on Ministry with involvement of other ministries, networks and an specific Evaluation Committee	Monitoring carried out by the Government but also external evaluations conducted. Role for the Innovation Advisory Council for Wales to advise on the evaluations
Coordination/ management of the innovation policy-mix	Regular meeting between Regional Government and SPRI program managers	Regular meetings between program managers Overall coordination within the RIS3 Coordination Group (stahelholders included)	One ministry and two agencies involved Rationale discussed with stakeholders through RIS3 definition Strong continuous	Intermediate bodies and communities of best practices

			coordination between institutions involved	

Source: own elaboration based on individual baselines

Summarising, we can highlight that different contexts and approaches to AM lead to different policy-mixes. That is, instruments implemented in a region/country are dependent on many factors, such as industrial structure, dependence of EU funding and instruments historical roots (path dependency).



However, some common features of the Manumix regions policy mixes could be highlighted such as their directionality, their strong focus on economic instruments, their target on high TRL levels and a predominance of facilitation type of interactions (intentional and unintentional) among the individual instruments.

In order to capture the interactions for policy learning purposes it is necessary to develop a policy evaluation that includes the dimension of the policy-mix, as it will be described in the next section.

5. Evaluation practices and management

Evaluation can be regarded in general terms as the "process that seeks to determine as systematically and objectively as possible the relevance, efficiency and effect of an activity in terms of its objectives, including the analysis of the implementation and administrative management of such activities" (Papaconstantinou and Polt, 1997). It is part of the policy making process and besides the evaluation activities, methods and indicators, it also encompasses the process by which the results of such exercises are included in the policy making process.

Evaluation is a key element in the implementation of RIS3, since it provides the information needed to assess the achievement and adequacy of goals and thus, is a strategic tool for RIS3 development (Ginaelli et al., 2016).

Table 6. Monitoring indicators for RIS3 *(adapted from Gianelli et* **al, 2016)**

Type of indicator	Function
Output	Measuring the type and level of direct output produced by funded projects.
Result	Measuring the degree of achievement of the socio-economic objectives (of the strategy for each of the S3 areas)
Implementation	Measuring the actual state of implementation of the policies and related actions undertaken in the territory.
Structural change and specialization	Measuring the absolute and relative changes taking place in production systems comprised in each of the S3 areas according to trajectories and transitions foreseen in the strategy for each priority and for the whole economy and society.
Context	Providing a picture of the competitiveness of the regional economy, with particular reference to issues of research and innovation and the evolution of production systems at large.

According to the RIS3 implementation guide published by the EU, RIS3 evaluation should be result-oriented and has two primary objectives: (1) to measure the type and level of direct output produced by funded projects; and (2) to measure the degree of achievement of the socio-economic objectives and changes in the production system. To this ends, a RIS3 monitoring system should at least include output indicators (direct products of the policy interventions) and result indicators (socio-economic effects in target groups); and extensively, indicators by RIS3 priority areas, and link between indicators and changes that aims at producing.

However, and adding one additional element to this summative role of monitoring and evaluation, these activities should also have a formative role, that is to say, should be key for learning about what works and doesn't and therefore have a transformative role.

Manumix partner regions have stablished sophisticated evaluation systems that include all these requirements. However, representatives of some of the regions have acknowledged that that measuring structural change is still a challenge that needs further exploring and developing and even more to develop this formative role of evaluation within the regions.

The policy mix lens adds one more element of complexity to evaluation endeavour because it implies taking into account the interactions among different programmes. Indeed, evaluating the policy mix, the interactions and relations within it, is precisely one of the challenges in all partner regions. As shown in Table 7 all Manumix regions have evaluation mechanisms for RIS3 and Advance Manufacturing strategy and specific evaluation systems for individual instruments. However, evaluation of policy mixes still remains a common challenge.

Table 7. Scope of evaluation in Manumix partner regions

Scope of the evaluation				
Region	RIS3	AM Strategy	Policy mix (interaction)	Individual instruments
Basque Country	✓	✓	x	✓
Lithuania	✓	✓	x	✓
Piedmont	✓	✓	x	✓
Wales	✓	✓	✓	✓

Source: own elaboration

Regarding the evaluation types and methods, all regions include ex ante, interim and ex-post evaluations, although with different scope (i.e., Piedmont has conducted ex ante evaluation only for financial instruments). To this end, regions use a wide range of types of quantitative

and qualitative analysis methods such as forecast analysis, case studies, surveys, expert panels, focus groups and in-depth analysis of selected projects and beneficiaries.

On the other hand, one of the features of all partner regions regarding evaluation governance is the stakeholder involvement in the evaluation practice, especially for strategy evaluation. Some other common features include:

- ✓ All regions make internal and external evaluation (though consultants, experts, other ministries than the responsible ones, and specific evaluation bodies) both at instrument level and strategy level the
- ✓ There is high stakeholder involvement in the evaluation practice, especially at strategy evaluation. It is materialized through different mechanisms, such as (i) institutionalized bodies where stakeholders are members (i.e. the Monitoring Committee in Piedmont and Innovation Advisory Council in Wales) (ii) though consultation for monitoring (i.e. panel discussions in Lithuania) (iii) though steering groups (i.e. Basque Country). Moreover, stakeholders are involved in different RIS3 governance mechanisms, such as Coordination Groups, where results of evaluation are taken into account for decision making purposes. Hence, all regions have conceived evaluation beyond accountability purposes, as a policy learning mechanism.
- ✓ Stakeholder involvement is much softer in individual instruments evaluation, where beneficiaries are mainly included in the processes as objects of data gathering.
- ✓ Evaluation is also conceived as a means of accountability towards society. That is, especially in some regions, results of evaluation activities are widely disseminated. This is the case of Lithuania, where reports with extensive information on individual instruments and strategy evaluation are included and are available to the public on the internet. In Piedmont, there exists also a special budget assigned to dissemination and creation of a "culture of evaluation".

Table 8. Overview of evaluation activities covered in Manumix partner regions

	Scope of evaluation	Purpose	Ex-ante evaluation	Monitoring	Ex-post evaluation
Basque Country	RIS3 -Policy Instruments	Obtaining data on instruments. -Impact assessment of specific programmes. -How certain instruments can contribute to the RIS3 strategy	--RIS3: monitoring of the previous situation and evolution	- Instruments monitoring is run by SPRI - Basque RIS3 monitoring is run by Innobasque	-Innovation contribution to regional productivity

Lithuania	Individual instruments of the policy mix Thematic priorities of AM Strategy – RIS3	Accountability Learning	Strategic programming documents, country infrastructure, sectoral priorities and trends(forecast, case studies, surveys, panel discussions) Complex process based on extensive studies, expert panels and stakeholder involvement in order to define priorities	Monitoring implementation and efficiency of programmes and instruments Biannual reports on progress and the achievement of planned results: evaluation of output, results, implementation degree and efficiency, and context	Progress and impact assessments towards result, outputs, impact of operational and sectoral programmes, policy instruments Progress and impact assessments towards result, outputs and impact of priorities/strategy
Piedmont	ERDF and ESF Operation Programme 2014-2020 Piedmont S3 Financial Instruments	Accountability Learning	Only for financial instruments. The methodology used follows the guidelines in ERDF ex- ante evaluation methodologies given from the European Commission.	The monitoring is run by a technical structure which provides updated information on the regional scenario for research and innovation, as well as on the national and international reference context.	The methodology will follow the guidelines in ERDF ex- post evaluation methodologies given from the European Commission.
Wales	Strategy, RIS3, Individual instruments and policy-mix	Accountability Learning	Only for grants/loans instruments (not for public procurement)		Mixed methodologies (quantitative trying to measure long term impacts and qualitative

Source: own elaboration based on Manumix regions' individual baselines

To conclude, all partner regions incorporate evaluation practices and mechanisms for RIS3 - including each of the priorities and thus AM priority- which are multidimensional. Monitoring of individual instruments included in the policy mixes are also conducted in all regions.

A wide range of methods is used for doing ex-ante, monitoring and ex-post evaluation, both at strategy level and instrument level, with a wide stakeholder involvement in the former. Hence, RIS3 seems to have been a positive step for all regions for improving evaluation practices in innovation policy making. Nevertheless, evaluation of interactions within the policy mixes and measuring long term socio-economic impact is a challenge for most of the regions.

6. Conclusions

As the report has presented Manumix partner regions share a common goal of industrial modernization, which their AM strategies aim to contributing to. This general goal is materialized in different specific regional challenges that are context-specific and related to diverse socio economic and institutional contexts of the regions.

Although targeted at different sectors, markets and challenges, all partner regions share an AM strategy that is cross-sectorial and multi-technological. The implementation of AM strategies is carried out through a wide range of policy instruments which are mainly economic and direct, targeted at medium to high levels of TRL, some horizontal and some vertical mainly through the inclusion of AM priority in the selection priorities of funded programs. With the exception of Lithuania that has a policy mix targeted at research institutions, the policy mixes of partner regions are business oriented. Besides, the policy mixes combine intentional and unintentional interactions, with a predominance of the facilitation type of relation between the different instruments.

In addition, all partner regions have stablished sophisticated evaluation mechanisms for strategy and instrument evaluation, which also includes governance arrangements for incorporating evaluation to decision making and policy learning purposes. However, evaluation of the interactions between the instruments, that is, evaluation of policy mixes is something that needs to be further developed. In sum, evaluation needs to evolve from capturing the effect of single instruments to analyzing the effects of a combination of instruments towards a strategic goal.

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