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PLAYING THE LONG GAME: EXPERIMENTING SMART SPECIALISATION IN THE BASQUE COUNTRY 2016-2019

Mari Jose Aranguren
Edurne Magro
Kevin Morgan
Mikel Navarro
James Wilson

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ABSTRACT

Smart specialization strategies (RIS3) represent arguably the most ambitious regional innovation policy ever launched in the EU and as such have posed a major challenge for governments. While developing a smart specialization strategy has not been an entirely new adventure for the Basque Country, which has consistently pursued an industrial strategy over more than thirty years, there is enough novelty in the RIS3 process to pose a challenge even for mature regional innovation policy systems. This report builds on previous analysis of the early implementation of the Basque Country RIS3 (Aranguren et al, 2016) to explore how the processes initially set in motion have subsequently evolved. The focus is on the period 2016-2019 and the analysis is based on interviews with 28 key actors in the Basque RIS3 process alongside a range of other documentary sources.

The analysis finds significant changes in the governance of the entrepreneurial discovery processes established in the three strategic priority areas (advanced manufacturing, energy and bio-health) and four opportunity niches (ecosystems, food, urban habitat and creative and cultural industries). These are materializing in changes in the actors engaged and the strategies pursued, and they lead to six core conclusions that might form the basis for recommendations for the future.

1. In line with a 'living strategy', a new configuration of priorities is emerging
2. There is an increasing horizontalization taking place, built on cross-cutting concern for internationalization, skills, new business models and entrepreneurship
3. Engaging SMEs remains a huge challenge, and Basque experience points to key roles for cluster associations, local development agencies and vocational training centres
4. The integration of social challenges (and civil society) remains a key challenge, and might take inspiration from Agenda 2030 and from transformative innovation policy or mission-oriented policy approaches
5. There is a specific need for larger, more integrated projects, which will require further adaption of the implementation and policy mix
6. There is need to work on the voice of regions within EU decision-making dynamics and to strengthen coordination across regional initiatives

The evolution of the entrepreneurial discovery process observed in the Basque Country sheds light on some of the key issues with the ongoing development of RIS3 across Europe. These include the nature of their experimentalist polity, the further reform of regional research and innovation systems, the rising status of monitoring and evaluation as a strategic diagnostic tool, and the need to re-enforce synergies between EU policy instruments and across EU regions.

RESUMEN

Las estrategias de especialización inteligente (RIS3) representan sin duda el ejercicio de política regional de innovación más ambicioso promovido hasta la fecha por la Unión Europea y, como tal, han supuesto un gran reto para las regiones. A pesar de que, desarrollar una estrategia de especialización inteligente no ha sido una aventura completamente nueva para el País Vasco, ya que ha apostado continuamente por implantar en la región estrategias industriales durante más de treinta años, el proceso RIS3 presenta las suficientes novedades para ser considerado un reto incluso para sistemas y políticas de innovación regionales ya maduros. Este informe tiene como punto de partida el análisis previo sobre la primera fase de implantación de la RIS3 del País Vasco (Aranguren et al. 2016) y explora cómo los procesos puestos en marcha han evolucionado desde entonces. Así, el análisis, basado en entrevistas con 28 actores clave del proceso RIS3 vasco y en el estudio de fuentes documentales, se centra en el periodo 2016-2019.

El análisis realizado revela cambios significativos en la gobernanza del proceso de descubrimiento emprendedor establecido en las tres áreas prioritarias (fabricación avanzada, energía y bio-salud) y los cuatro nichos de oportunidad (ecosistemas, alimentación, hábitat urbano, industrias culturales y creativas). Estos cambios se materializan tanto en la involucración de actores como en la estrategia perseguida y llevan a las siguientes conclusiones, que son la base de las recomendaciones futuras:

1. De acuerdo con una "estrategia viva" está emergiendo una nueva configuración de prioridades

2. Se aprecia una creciente transversalidad, al identificarse como prioritarios temas comunes a las diferentes áreas, como la internacionalización, las competencias, los nuevos modelos de negocio y el emprendimiento.
3. Involucrar a la Pyme sigue siendo un gran reto y la experiencia vasca apunta como fundamental el papel de las asociaciones clúster, las agencias de desarrollo local y los centros de formación profesional.
4. La integración de los retos sociales (y la Sociedad civil) sigue siendo un reto pendiente que puede inspirarse en la Agenda 2030 o en las aproximaciones de políticas de innovación transformadoras u orientadas a una misión.
5. Existe una necesidad específica de proyectos de mayor tamaño y más integradores, lo que requeriría una mayor adaptación de la implementación y el *policy-mix*.
6. Se hace necesario trabajar en que la "voz" de las regiones tenga más presencia en las dinámicas de decisión de la UE y fortalecer la coordinación entre las iniciativas regionales.

La evolución del proceso de descubrimiento emprendedor observado en el País Vasco contribuye a algunos de los aspectos clave del desarrollo de la RIS3 en Europa. Entre estos aspectos destaca la naturaleza experimentalista de la política, la necesaria reforma de los sistemas de investigación e innovación, la relevancia de la monitorización y evaluación como herramienta de diagnóstico estratégico, y la necesidad de reforzar las sinergias entre los instrumentos de política de la UE y entre las regiones europeas.

LABURPENA

Espezializazio adimentsuko estrategiak (RIS3), zalantzarik gabe, Europar Batasunak orain arte sustatutako erregioetako asmo handieneko berrikuntzako politikak dira eta erregioentzat erronka handia dira. Espezializazio adimentsuaren estrategia garatzea Euskadientzat guztiz abentura berria izan ez bada ere -Euskadik hogeita hamar urte baino gehiagoz industria estrategiak ezartzen bait dihardu-, RIS3 prozesuak erronka handia da jadanik heldutasun handiko berrikuntza sistemak eta politikak dituzten erregioentzat ere. Txosten honek aurretik burututako EAEko RIS3aren lehen faseko azterketa (Aranguren et al. 2016) du abiapuntu, eta ordutik martxan jarritako prozesuak nola eboluzionatu duten aztertea du helburu. Horrela, analisia, euskal RIS3 prozesuko 28 eragile garrantzitsuekin egindako elkarrizketetan eta dokumentu-iturrien azterketan oinarrituta, 2016-2019 aldiaren analisisan zentratzen da.

Analisiak aldaketa garrantzitsuak agerian utzi ditu hiru lehentasunetan (fabrikazio aurreratua, energia eta bio-osasuna) eta lau aukerako nitxoetan (ekosistemak, elikagaiak, hiri habitata, kultura eta sormen industriak) ezarritako aurkikuntza ekintzailearen prozesuaren gobernantzan. Aldaketa horiek aktoreen inplikazioan eta aurrera eramandako estrategian gauzatzen dira eta hurrengo ondorioak dira, etorkizuneko gomendioen oinarria:

1. Martxan dagoen "Estrategia biziaren" arabera, lehentasunen konfigurazio berri bat sortzen ari da
2. Gero eta zeharkakotasun handiagoa ikusten da, arlo desberdinetarako gai komunak lehentasun gisa identifikatzen baitira, nazioartekotzea, gaitasunak, negozio-eredu berriak eta ekintzailetza.
3. ETEak inplikatzek erronka handia izaten jarraitzen du eta euskal esperientziak funtsezkotzat jo du kluster elkarteek, tokiko garapen agentziek eta lanbide heziketako zentroek duten zeregina.
4. Gizarte-erronkak (eta gizarte zibila) integratzea 2030 Agenda edo berrikuntza politika eraldatzaile edo misioetara bideratutako ikuspegietan inspiratu daitekeen erronka bat da.
5. Proiektu handiagoak eta inklusiboagoak izateko berariazko beharra dago, betearazpen eta politiken konbinaketaren egokitzapen handiagoa beharko luketena.
6. Lan egin behar da erregioen "ahotsak" presentzia handiagoa izan dezan EBko erabakien dinamikan eta eskualdeko ekimenen arteko koordinazioa sendotzeko.

Euskadin ikusitako aurkikuntza ekintzailearen prozesuaren bilakaera European RIS3 garatzeko funtsezko alderdi batzuetarako lagungarri da. Alderdi horien artean, politikaren izaera esperimental, ikerketa eta berrikuntza sistemen beharrezko erreforma, jarraipen eta ebaluazio diagnostikoak tresna estrategiko gisa duen garrantzia eta EBko politiken tresnen arteko sinergiak indartu behar dira Europako erregioen artean.

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LIST OF ACRONYMS

ACLIMA	Basque Environment Cluster Association
AM	Advanced Manufacturing
AR	Advanced Region
AZTI	Technology centre expert in sea value chain and food
BCSTI	Basque Council for Science, Technology and Innovation
BNSTI	Basque Network of Science, Technology and Innovation
CCI	Creative and Cultural Industries
CSO	Civil Society Organisations
DEDI	Department of Economic Development and Infrastructures
DCLP	Department of Culture and Linguistic Policy
DP	Department of the President
EC	European Commission
ECA	Energy Cluster Association
EHU-UPV	Public University of the Basque Country
ESIF	European Structural and Investment Funds
ELKARGI	Basque Mutual Guarantee Society
EU	European Union
EUDEL	Association of Basque municipalities
EUSKALIT	Basque organisation of Advanced Management
GAIA	Basque ICT Cluster Association
HABIC	Basque Cluster Association for Housing, Office and Contract Furnishing
ICT	Information and communication technologies
IHOBE	Basque Environment Agency
Innobasque	Basque Innovation Agency
KIC	Knowledge and Innovation Communities
LDR	Less developed region
M&E	Monitoring and evaluation

Orkestra	Basque Institute of Competitiveness
PTC	Collaborative tracking projects
R&D	Research and development
RIS3	Research and Innovation Strategies for Smart Specialisation
SAC	Scientific Advisory Committee
SG	Steering group
SPRI	Basque Industrial Development
STIP	Science Technology and Innovation Plan
TRL	Technology readiness levels

1 INTRODUCTION

Alongside regions across Europe, the Basque Country embarked on a smart specialization journey in 2014. This was prompted in part by the new ex-ante condition of European Regional Development Funding that required all regions to have a Research and Innovation Strategy for Smart Specialisation (RIS3) in place before their operational programmes could be approved (European Commission, 2014). In the case of the Basque Country, this external prompt coincided with an internal conviction that the existing science, technology and innovation strategy process required revision. Indeed, in this sense developing a smart specialization strategy was not an entirely new adventure for the Basque Country. It can be seen rather as a new phase in an industrial strategy that had been consistently developed over more than thirty years (Aranguren *et al.*, 2012, 2013; Morgan, 2016).

A study in 2016 analysed the early implementation of this new smart specialization phase of the Basque industrial strategy, focusing on the key novelties in governance mechanisms and the launch of processes designed to foster entrepreneurial discovery in 3 strategic priority areas and 4 opportunity niches (Aranguren *et al.*, 2016). The aim of this study is to explore what has happened since then and to understand how the entrepreneurial discovery processes set in motion between 2014 and 2016 have evolved over the last 3 years. This is an important question not only for the Basque Country – to take stock and reflect on desirable changes that will ensure the future success of the strategy – but also for the debate within Europe and beyond around the implementation of smart specialization strategies.

This report is the result of a research process that has been conducted during the first half of 2019. The report is structured as follows. First the latest international developments with regards the implementation of smart specialization strategies are reviewed. Secondly, the Basque RIS3 is positioned within these developments and in terms of its antecedence and evolution. The methodology for this study is then set out, before moving to the core analysis in three steps: the general evolution of the Basque RIS3 in the period 2016-2019; the evolution of the entrepreneurial discovery process in 3 strategic priority areas identified by the Basque strategy; and the evolution of the entrepreneurial discovery process in 4 opportunity niches identified by the Basque strategy. This leads into a final chapter of integrated analysis and conclusions.

2 RIS3 IMPLEMENTATION: THE STATE OF ART

To contextualise the Basque experience, this chapter provides a very brief overview of the RIS3 process across the European Union (EU), focusing in particular on three aspects: (a) the changing cast of key actors; (b) the efficacy and inclusivity of new governance structures; and (c) emerging regional innovation policy issues.

RIS3 is arguably the most ambitious regional innovation policy ever launched in the EU and for this reason it has posed a major challenge for both the regional and national governments that have been charged with implementing it. The challenge was especially acute for regions and countries that were new to the regional innovation policy process, in Central and Eastern Europe for example as well as in some parts of Southern Europe. The Basque Country was more fortunate because, beginning in the 1980s, it had been an early practitioner; so much so that it can legitimately claim to be one of the pioneers of regional innovation policy. Even so, there is sufficient novelty in the RIS3 process to pose a challenge even for mature regional innovation policy systems such as the Basque Country, as we will see in later chapters.

Grappling with Novelty: The Changing Cast of Key Actors

Although RIS3 is its most ambitious example, EU regional innovation policy will mark its 30th anniversary next year because its origins lie in the STRIDE programme that the European Commission launched in 1990 (Morgan and Nauwelaers, 2000). Throughout this period the key actors have been regional governments and, with very few exceptions, they have dominated the process to such an extent that they designed and implemented the innovation policy measures as they saw fit, working with local actors in business, research and technology transfer who were very much perceived as junior partners. Arguably the greatest novelty of the RIS3 programme is the fact that it involves a more elaborate cast of actors – especially firms, business clusters, universities, technology centres and even civil society organisations - all of whom are believed to be legitimate actors in the entrepreneurial discovery process that constitutes the core of the RIS3 programme (European Commission, 2012; Foray, 2015). Although these actors are officially deemed to have parity of esteem in the RIS3 process, on the grounds that innovative ideas can come from anywhere in economy and society, the experience to date has revealed more continuity with the past as regards the principal actors than the policy architects anticipated at the outset (Kroll, 2017; European Commission, 2017).

According to the chief architect of RIS3, the “main goal of a smart specialisation policy is to concentrate resources on the development of those activities that are likely to effectively transform the existing economic structures through R&D and innovation” (Foray, 2015: 3). The main actors in the traditional model of innovation – the so-called STI model – have been government, universities and business, the three members of the celebrated Triple Helix (Etzkowitz et al, 2007). But one of the most pervasive myths in the regional innovation policy community is that a Triple Helix coalition is either already in place or can be readily assembled for the purpose of promoting innovation and enhancing the knowledge economy. Among other things the myth implies that governments, universities and businesses have forged a common cognitive outlook and aligned their interests to such an extent that they are able to collaborate for mutually beneficial ends. However, “the reality is far removed from the rhetoric of the Triple Helix because the difference in values, mandates and timescales that characterise the three sectors means that a well-organised tripartite coalition tends to be the exception rather than the norm” (Marques and Morgan, 2018: 283).

If it has proved difficult to synchronise the activities of the Triple Helix partners, it has proved even more difficult to integrate less traditional actors, such as civil society organisations (CSOs) and city governments. On account of their capacity for social innovation, which is highly pertinent in an era of societal challenges and mission-led research, CSOs were deemed to be potentially valuable actors in the original RIS3 guidelines (European Commission, 2012). If it was highly endorsed by the EC, why was social innovation not more widely targeted for funding when it came to the implementation of RIS3 projects? The RIS3 Guide proved to be highly prescient when it anticipated some of the barriers to this new model of innovation: “Social innovation is a relatively new concept...There is a risk of it being hampered by insufficient knowledge, limited support of grass roots...poor diffusion and little scale- up of good practices and poor methods of impact

evaluation". But above all, it said, social innovation requires "considerable mentality change" (European Commission, 2012: 113).

In addition to these barriers, recent academic research has found social innovation to be an extremely malleable and highly contested concept, in both theory and practice, such that it has been appropriated by a wide range of causes (Marques et al. 2017). It may also be the case that many CSOs are more geared up for protesting against rather than participating in the prosaic bureaucratic world where priorities are identified and translated into concrete projects.

Cities are another example of an actor that is relatively new to the regional innovation policy community and national and regional governments have struggled to involve them in the RIS3 process. Although cities (in the form of city governments) were barely mentioned at the design stage, they have assumed more importance in the implementation stage of the RIS3 process, not least as demonstration sites for innovation projects. A recent report illustrated the point:

*Generally speaking, the participation of cities in RIS3 designs (we mean local/metropolitan authorities and their relevant subsidiaries working on economic development) has been mostly superficial so far...But now, at the **implementation stage**, a number of major cities offer great potential to collaborate in developing RIS3 over the ground, beyond their role as testbeds. It seems to be the right time for scale management, boosting relevant collaboration between regions and cities. Fortunately, the need for effective implementation has created a new framework where the issue of **multi-level governance** has seemingly been placed at the core. The RIS3 guide on implementation even includes a reference to the city level: 'interaction and coordination between regions, territories and cities with regard to regional/national Smart Specialisation Strategies are required to avoid fragmentation and increase the impact of investments across Europe' (Rivas, 2018: 20).*

The task of integrating the key actors of a region – traditional actors as well as newcomers – falls to the regional government and the latter is also responsible for curating the RIS3 process in a manner that is open, transparent, accountable and effective. Curating skills are radically different from the command and control repertoires with which regional governments are more familiar and making this transition from controller to curator has been one of the biggest governance challenges in the RIS3 implementation process (Gianelle et al, 2016).

Creating Effective and Inclusive Governance Structures

Creating effective and inclusive governance structures has proved to be the most challenging aspect of the RIS3 programme since it was officially rolled out in 2014. Empirical surveys of the RIS3 implementation experience have confirmed that *path dependence* helps to explain the uneven governance patterns that have subsequently emerged, in the sense that the RIS3 exercise has had the biggest impact in the countries and regions with the least experience of regional innovation policy in the past. For example, the annual Fraunhofer survey discovered that "policy-makers from Southern and Eastern Europe are somewhat more prone to consider RIS3 efforts a 'paradigm shift in governance' than those from the Nordics and Central Europe" (Kroll, 2017: 21). This change in governance resonates with findings from other sources which found that, whatever its limitations, the RIS3 exercise has encouraged the public administrations in southern and eastern into creating more diverse and inclusive governance structures than the regional innovation policies of the past and this is partly due to the use of novel regulatory requirements, such as the ex-ante conditionality (Aranguren et al., 2019; European Commission, 2017).

A more granular empirical analysis of 15 EU regions - distinguishing between advanced, intermediate and less developed regions - also found that the territorial contrasts in governance structures were explicable in terms of policy path dependency because "in LDRs we see the most positive impact of the introduction of S3 on stakeholder involvement, with some changes to past practices also evident in IRs. In contrast, the gains in ARs appear to be more incremental, rarely extending beyond those parties traditionally involved in innovation strategy making. This raises a real challenge for the S3 approach if it truly wishes to embrace notions of social and more inclusive innovation" (Tripl et al., 2019: 11).

Another important finding from this 15-region study found that one of the most difficult problems for the governance

system revolved around the identification of priority domains, a problem that will resonate for every country and region involved in the RIS3 exercise. As regards this problem the authors concluded by saying that while “some of the priority domains selected are overly broad and lack focus, there are also reasons to argue that such breadth allows for experimentation and self-selection during the post-strategy development phase. Such refinement would form the measure of a true entrepreneurial discovery process and demonstrate the value of the approach undertaken. That it has been the ARs that have proven more able to develop novel groupings suggests that inherited capacity provides the foundations for such experimentation” (Trippel et al., 2019:11).

While broad priority domains are not necessarily a problem, so long as they are subject to further refinement and experimentation, other empirical studies have found that broad priorities can also be taken as evidence of a failure to concretise one’s chosen domains and convert priorities into commercially viable projects. This was the disturbing conclusion of one recent empirical study which found that:

The evidence we gathered reveals only a partial transition from the ‘old’ undifferentiated industrial policy, typical of European regional policy before 2014, to the highly selective Smart Specialisation approach. There are tangible signs that regions and countries have put in place mechanisms that can circumvent the very rationale of Smart Specialisation. This could be the result of lobbying activities, higher political return from widespread public support measures, risk-averse attitude of policy-makers, and lack of adequate institutional and administrative capacity that can be observed at national and regional levels. However, an additional explanation may lie in the incentive structure established at European Union level which did not fully support the intervention logic of Smart Specialisation (Giannelle et al., 2019: 10).

The above studies seem to suggest that while some genuine progress has been achieved with respect to *inclusive* governance, because a more diverse cast of actors has been involved in the RIS3 exercise than hitherto such progress is less discernible with respect to *effective* governance. This is evidenced by the fact that many countries and regions have been unable or unwilling to refine their broad priority domains into more concrete projects that can be commercially valorised.

Although the final judgement on the efficacy of governance arrangements will have to wait for the *ex-post* evaluations of the RIS3 exercise, the prospects are not encouraging if current monitoring and evaluation (M&E) systems are an index of the state of play. One of the enduring problems of regional innovation policy throughout its history, a problem that persists in the RIS3 era, is the low political commitment to M&E mechanisms. As regards monitoring, the 2017 Fraunhofer survey found that the situation had not improved from the previous year: while two-thirds of respondents claimed that their region had some monitoring concept, only half of those had the capacity to track RIS3 priorities in an informed way. Equally disturbing is the fact that “a mere 43% of all respondents confirm that a monitoring report has been submitted to relevant authorities” (Kroll, 2017:12). This is one of the key issues for the future of the RIS3 programme as we note in the following section.

Implementing RIS3: The Key Policy Issues

From the experience of the current ESIF programming period (2014-2020) we can identify 6 key policy issues that need to be addressed as a matter of urgency if the RIS3 exercise is to be rendered less transactional and more transformative. The European Commission accepts that the first four of these issues constitute the key challenges for the future of the RIS3 programme (European Commission, 2017); while the final two issues have been identified by critical friends of the RIS3 exercise.

Key issue 1: Further reform of research and innovation systems

Effective R&I systems consist of innovation-related investments in R&D, ICT and skills development. These processes are affected by different factors that can range from the functioning of the institutional set-up, the abundance and quality of the infrastructure network or the functioning of the markets that allow for an efficient allocation of resources to more

productive activities. According to the European Commission, the reform of national and regional R&I systems should focus on the two most egregious aspects of system failure: (a) building stronger synergies between the institutions that generate knowledge (such as universities) and those that utilise and valorise knowledge (such as firms); and (b) a stronger focus on both types of skills development, namely higher education as well as the much more neglected vocational education and training.

Key issue 2: Increasing cooperation in innovation investment across regions

Promoting innovation through cross-border value chains has been the least successful aspect of the RIS3 exercise. Although the Vanguard Initiative has sought to redress this weakness, it has struggled to overcome the barriers to cross-border collaboration because they involve *political* barriers (local politicians do not favour out-of-area investments), *knowledge* barriers (like not knowing who are the best partners) and *financial* barriers (related to the lack of effective instruments to support large, inter-regional projects). The EC strongly believes that regional innovation eco-systems could be further strengthened through transnational learning and training and collaboration and it is trying to devise regulations and initiatives that are more supportive of the cross-border investments, such as the Thematic Smart Specialisation Platforms on energy, agri-food and industrial modernization or the European Strategic Cluster Partnerships.

Key issue 3: Leveraging research and innovation in less developed and industrial transition regions

The EC has come to accept that RIS3 is a place-based as well as path-dependent process. The RIS3 experience in regions and member states with a weak innovation or entrepreneurial legacy has been substantially different to the experience in northern Europe and to address these problems the EC needs to build on more targeted initiatives, such as Targeted RIS3 Support to Lagging Regions and the TAIEX REGIO Peer-2-Peer scheme to promote mutual learning, mentoring and twinning arrangements. These peer-to-peer schemes have enormous potential to support and sustain inter-organisational learning between regions and countries, but they need to be better resourced.

Key issue 4: Harnessing synergies and complementarities between EU policies and instruments

The European Commission accepts that it needs to do far more to promote synergies and complementarities between EU funds for research and innovation because the lack of synergies has been acknowledged at the highest political levels. But if the past is a guide to the future, then securing policy synergies will be easier said than done because synergies that were formally available in principle have proved to be very elusive in practice – hence the need for *workable* synergies. The failure to secure workable synergies is not due to neglect on the part of the Commission; on the contrary, it has genuinely sought to secure greater policy synergies between H2020 and ESIF in the current programming period, having issued detailed guidance to policy-makers and implementing bodies (European Commission, 2014). The real barrier to policy synergies is more to do with the fact that the two programmes are so radically different: for example, H2020 operates under central management by the Commission while ESIF operates under shared management, with Member States and Commission jointly responsible; and while H2020 funds are allocated on the principle of “excellence”, ESIF funds for less developed regions are allocated on the basis of “need”; and the two programmes operate with very different spatial coverage since H2020 funds trans-national projects, while ESIF funds national and regional projects. In short, the Framework and Cohesion programmes operate with different principles, procedures and very often with different partnerships. While a clear legal basis for synergies has been in place since the beginning of the current programming period, the coordination for and support of synergies between the two programmes “is not optimal” according to the EC’s own internal assessment and therefore the post 2020 programming period will need to foster rather than frustrate R&I policy synergies (Morgan and Marques, 2018).

Key issue 5: Raising the Status of Monitoring & Evaluation (M&E) Systems

If the RIS3 is to be rendered more transformational we need to generate faster feedback as to what works where and why, and this can only be done through more robust M&E systems. But because regional practitioners tend to see M&E in terms of an externally imposed audit function – a command and control tool to police compliance – they miss the real

significance of M&E activity: that it is primarily a learning tool that must be integrated into the governance of policy mixes (Magro and Wilson, 2019). This was the key point that Charles Sabel made at the Smart Regions Conference in Brussels in 2016, when he argued that RIS3 needed more *diagnostic monitoring*, which involves “*monitoring* to underscore the continuing need at all levels to check on progress, given the limits of planning, and *diagnostic* because the aim is to facilitate and organize problem solving by the actors, not to use the threat of punishment for bad performance as an incentive for good behaviour” (Sabel, 2016). In the absence of diagnostic monitoring, he warned, “RIS3 could become a new name for business as usual” (Sabel, 2016). The paradox of M&E is that it labours under a Cinderella status when in fact it is a crucially important part of the repertoire of experimental governance (Morgan, 2018).

Key issue 6: The Experimentalist Polity

In an earlier report we underlined the need for collaborative and distributed forms of place-based leadership (Aranguren *et al.*, 2016). In this conception the regional government assumes primary and secondary roles depending on the stage in the lifecycle of the RIS3 process (and the maturity of and capacities present in each of the priority areas). The primary role is most pronounced at the beginning of the process (and in priority areas where the capacities of other stakeholders are weaker), when the regional government needs to establish the “rules of the game” by creating the framework for collective action. Later, when the process is underway, other actors will need to assume a more prominent leadership role in working groups to define priorities and to translate these priorities into more concrete projects, a protean process that is dynamic and subject to a good deal of pivoting and experimentation as the 15 region study illustrated earlier. Distilling this granular experience into a more generic principle we might say that the governance system of a RIS3 exercise needs to be kept as “alive” as possible and this requires the regional government to play the role of a sensitive curator rather than a regimented taskmaster. This is perhaps the biggest challenge of all for the RIS3 programme because it involves a radical shift in the political culture of public administrations, from hierarchical and self-referential bureaucracies to more porous and experimentalist polities.

3 BASQUE COUNTRY RIS3

The development and subsequent implementation of a smart specialization strategy in the Basque Country is the latest phase of an industrial strategy that began in the 1980s. Three previous phases can be identified (Valdaliso, 2015): (i) the crisis-induced industrial restructuring of the Basque economy in the 1980s; (ii) the cluster-based strategy to drive forward efficiency and internationalisation in the 1990s; and (iii) the sustained focus on innovation and science-driven industrial diversification in the 2000s. The third phase laid the immediate foundations for the current Basque RIS3, which is embodied in the Science, Technology and Innovation Plan 2020 (STIP 2020). Thus, a fourth phase can be distinguished from around 2013 that is focused on the principles of smart specialization: building on and diversifying from combinations of existing industrial and scientific strengths, and market opportunities opened by societal challenges.

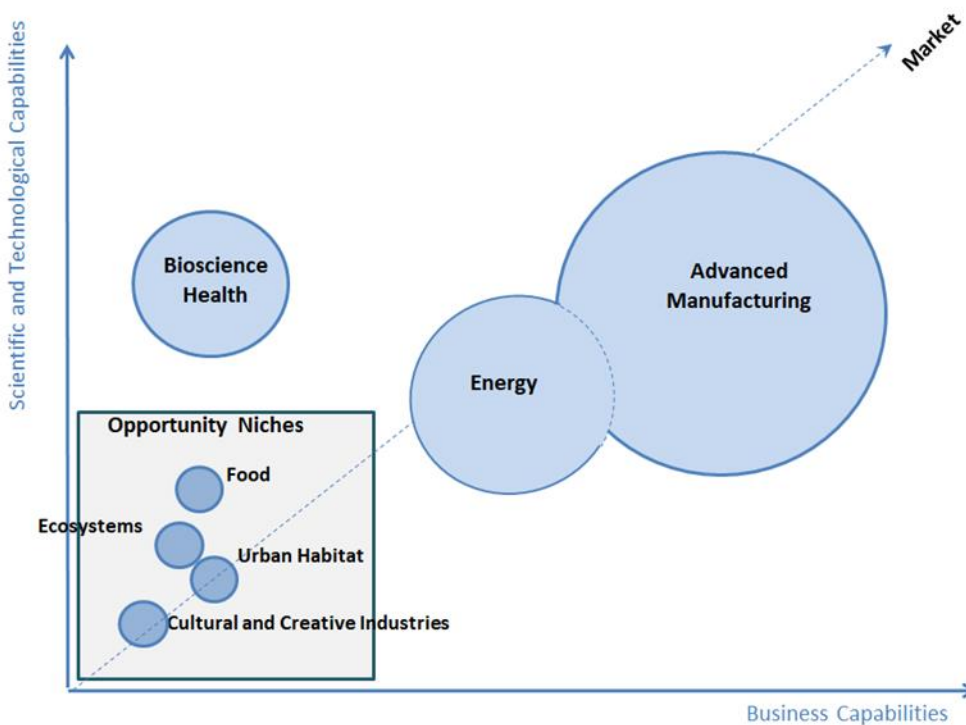
Design of Basque RIS3 (2013-2014)

The elaboration of the STIP 2020 began in 2013 under the leadership of the Department of Economic Development. In this initial phase emphasis was placed on the need for a 'living strategy' rather than another 'static strategy document', and there was a strong focus on analysis of existing realities. Specifically, a diagnostic centred on industrial capabilities, scientific capabilities and market opportunities derived from societal challenges supported the selection of 3 strategic priority areas: advanced manufacturing, energy and biosciences-health.

In discussing these 3 priorities, the importance of the involvement and collaboration of multiple government departments became evident. This led to the Department of the President (DP) taking on leadership of the STIP 2020. While the process of developing the plan was clearly government-led, it built explicitly on the previous STIP 2015 that was widely acknowledged as being participative in its design, and it actively sought feedback through bilateral discussions between the key departments involved, and consultations with the Basque Council for Science, Technology and Innovation (BCSTI) and the Basque Science, Technology and Innovation Advisory Group (BSTIAG). Indeed, the consultation during the development of the plan led to important changes, such as the identification of four 'opportunity niches' (food, urban habitat, creative and cultural industries, and ecosystems) to be pursued alongside the strategic priority areas.

The RIS3 design phase culminated in the publication of the STIP 2020 at the end of 2014, structuring the Basque RIS3 around three strategic priority areas and four opportunity niches. While more of a gradual evolution than a radical break from past strategies, the priorities selected represent a balancing of short-term needs (the evolution of existing industrial strengths) with long-term needs (the identification of areas likely to be important in the future).

Figure 1: Basque RIS3 Priorities



Early Implementation of Basque RIS3 (2015-2016)

The early implementation phase of the Basque RIS3 is analysed in depth in an earlier report produced by Orkestra for the Department of the Presidency (Aranguren et al., 2016). They argued that following the approval of the STIP 2020 at the end of 2014, the period 2015-2016 focused above all on the deepening of governance mechanisms to guide implementation and the setting in motion of new spaces for entrepreneurial discovery (steering groups) in each of the 3 strategic priority areas and four opportunity niches.

While some 'ground rules' were established - initially the steering groups were charged with identifying a small number of key technology or business areas that underpin each and identifying and socialising key projects and key players in each area - there was considerable flexibility built into the steering group model. Indeed, it was evident during the early implementation phase that the steering groups were evolving at different speeds, adopting different forms of operationalising entrepreneurial discovery dynamics and engaging different mixes of actors. A common trend to which all groups were contributing, however, was the emergence of more distributed leadership at the operational level (Aranguren et al, 2016).

Aranguren et al (2016) concluded by identifying a series of issues that represented both achievements from the early implementation period and ongoing challenges:

- The need to keep the RIS3 alive
- The evolution of collaborative and distributed leadership
- The funding of the policy-mix supporting RIS3
- Multi-departmental coordination within government
- Coordination across different levels of government / territory
- The development of effective monitoring and evaluation

- Embedding RIS3 dynamics outside of the political process

Some of these issues have been further analysed in the Basque context through a series of policy briefs produced by Orkestra for the Department of the Presidency that explore multi-level governance (Aranguren, 2018), regional cross-border collaboration (Navarro, 2018) and the role played by clusters in RIS3 dynamics (Wilson, 2018).

The following chapters of this report steps beyond the early implementation period to analyse the subsequent evolution of the Basque RIS3 from 2016, when the steering group dynamics were already well-established, to 2019.

4 METHODOLOGY

The background research for this report was carried out during the first half of 2019. The research team conducted semi-structured interviews with 28 key actors in the Basque RIS3 process. These interviews covered a balance of people from government (13), business (6 firms + 2 cluster organisations) and research (7) that have played leading roles in the steering groups of the 3 strategic priority areas and 4 opportunity niches. The number of interviews among government representatives is higher because there were also interviews with individuals who had a general vision of the whole RIS3 process and with government agencies with different responsibilities for the operationalization of the STIP 2020 (such as SPRI, IHOBE and Innobasque).

The interviews followed a common guide and were structured in four parts, relating to: (i) general changes in the 2016–2019 period; (ii) changes among actors involved; (iii) changes in the strategy and in specific activities; and (iv) an overall evaluation of the process (see Annex 1 for the interview guide). Each interview was conducted by two members of the research team, one leading the questioning and the other leading the taking of notes. Detailed interview transcripts were compiled and agreed by the two researchers involved in each interview and then shared with the rest of the research team.

Alongside other relevant background documentation,¹ these detailed transcripts formed the basis for cross-sectional analysis in reflection sessions among the research team. This analysis was conducted according to a more structured set of themes for the RIS3 process in general and for each of the steering groups:

- Changes in organization / structure
- Involvement of SMEs and entrepreneurs
- Involvement of universities and research/technology centres
- Involvement of other significant actors
- Changes in focus of strategy
- Characteristics of strategic projects
- Integration of social and non-technological innovation
- Links to EU-wide initiatives
- Evaluation and impacts
- Main achievements
- Pending challenges

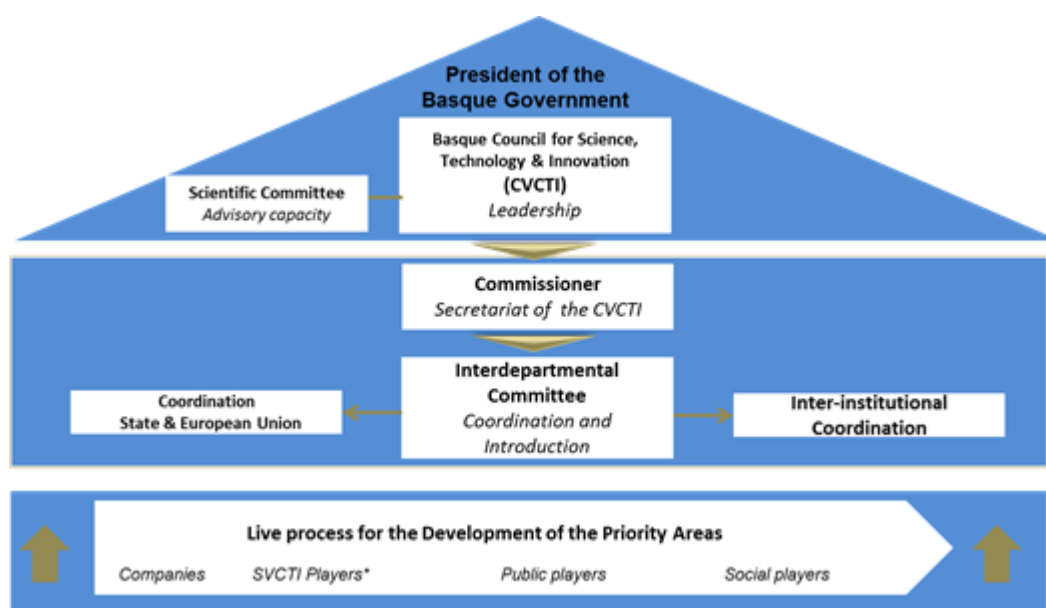
The results of this analysis were summarized in tables (see Annexes 2, 3 and 4) and formed the basis for analysis of the evolution of the RIS3 as a whole (Chapter 5) and within each of the strategic priority areas (Chapter 6) and opportunity niches (Chapter 7).

¹ For example, from the Basque Government's interdepartmental committee meetings or specific documents provided by interviewees.

5 GENERAL EVOLUTION OF BASQUE RIS3 2016-2019

The overall leadership of the Basque RIS3 rests with the Basque Council for Science, Technology and Innovation (BCSTI), and ultimately with the President of the Basque Country. Advice to the BCSTI and the President is provided by the Scientific Advisory Committee (SAC). The coordination and implementation of the RIS3 rely on relevant government departments connected through an inter-departmental committee and linked to the BCSTI and SAC by a Commissioner (supported by a Technical Secretariat). An inter-institutional Committee oversees coordination within the Basque Country among the regional, provincial and local administrations.

Figure 2: Basque RIS3 Governance House



Source: STIP 2020, Basque Government

The BCSTI was constituted in 2007 as the maximum body for strategic orientation in response to the need to establish systemic leadership that integrated initiatives from different levels of government. In 2014 its composition was amended to include a wider range of agents and explicitly to support the RIS3 (Aranguren et. al., 2016). In practice the BCSTI is a highly formal structure that meets twice a year to provide strategic orientation and advice, approving key elements of the strategic direction of the STI system and monitoring the implementation of the RIS3. Since 2016, besides this regular and overall task, the Council has also celebrated sessions to reflect on specific key subjects.

The SAC has been renewed during the period since 2016, to involve younger, more diverse and more technology-oriented people. A key challenge appears to be the need to reinforce its connection with other RIS3 governance structures.

The inter-departmental committee, which involves seven Basque Government departments, meets twice a year to oversee progress with the RIS3 and coordinate government actions. This committee provides each department with a general vision of what is happening elsewhere and is designed to help identify and pursue synergies and improve cross-department accountability. There have been no relevant changes in its functioning during the last two years, and there is an outstanding challenge to evolve its 'reporting' function towards a more reflective dialogue space for sharing learnings and challenges emerging in the different steering and working groups.

Inter-institutional relations are particularly important in the Basque context given the complexity of multi-level

government that characterizes the region. STI policy coordination among different levels of Basque administrations is being pursued by two of the committees. At the most formal level the BCSTI, on which the heads of the three Provincial Councils sit, provides a high-level degree of inter-institutional coordination. In practice, however, the focal point for within-region inter-institutional governance is provided by the inter-institutional committee. This committee meets after each interdepartmental committee and before the meeting of the BCSTI and is constituted by representatives from four departments of the regional government, the innovation or economic development departments of the three Provincial Councils and EUDEL (the association of Basque municipalities). It operates as a forum to share the regional RIS3 strategy in a top-down way to enable the sub-regional institutions to connect and/or align their own strategies with the regional strategy. These connections and alignments are expected to happen operationally through the involvement of other levels of government in the live processes for the development of the strategic priority areas and opportunity niches.

Aranguren et. al. (2016) identified *multilevel governance* as a key challenge for the Basque RIS3 and some proposals have subsequently been presented, for example involving Local Development Agencies in this multilevel approach to increase the participation of SMEs (Aranguren, 2018). During the last two years there were clear advances in terms of increasing the capillarity of the strategy, specifically through engagement between different levels of administration. This was highlighted, for example, by the participation of the Department of the Presidency alongside the three provincial councils, the three city councils and local development agencies in a European Commission peer exchange and learning (PXL) event on multilevel governance hosted in Bilbao. The challenge remains however to combine bottom-up and top-down approaches, in order not just to align the strategies of sub-regional levels with the regional one, but also to identify and manage the synergies among the strategies developed by different Basque institutions.

Another of the challenges for the Basque RIS3 identified by Aranguren et. al. (2016), and analysed further by Navarro (2018), was to foster *inter-regional collaboration*. This is an issue more generally in Europe given the geographical fragmentation of production and innovation capacities as compared to other parts of the world. In this respect, there is need to gain critical mass, overcome fragmentation in innovation efforts and ensure that synergies and cross-fertilisation possibilities between sectors and technologies are fully exploited (Frenken et al., 2007; Neffke et al., 2011). There have been clear advances in the period analysed here with regards interregional collaboration with neighboring Aquitaine and Navarre. Alcalde and Lorenz (2019) analyse how Competitiv'eko and other projects are exploring cross-border cooperation around smart specialization, and specifically how cross-border collaborative processes between research and innovation actors and industry can be designed to facilitate demand-led innovation and collective solutions.²

The live processes for the development of the strategic priority areas and opportunity niches provides the foundations for the Basque RIS3. This is where *entrepreneurial discovery* in and across the strategic priorities and opportunity niches takes place. Spaces for different agents from across the triple helix to meet are essential to stimulate entrepreneurial discovery, and in the Basque case these spaces have been created through a steering group (SG) model. Specifically, seven steering groups have been established corresponding to the 3 strategic priority areas and the 4 opportunity niches. While the government set the rules of the game and decided which actors should initially constitute the SGs, the groups themselves have subsequently established their own governance and determined who else to invite to participate. This dynamic process is playing out in different ways in each of the SGs, in what might be characterized as 'learning by doing'. During the last two years there is a very diverse evolution in the actors that participate and in how they participate, but what is common to all SGs is that they change according to what they learn.

Regarding the *range of actors* involved in the SGs and their specific working groups during the last two years, there is an increase in the participation of firms in general. There is also very clearly a higher awareness about the need to foster the

² See <https://www.orkestra.deusto.es/images/investigacion/publicaciones/cuadernos/retos-colaboracion-empresarial-transfronteriza.pdf>

participation of SMEs. In this regard there have been several activities to communicate the RIS3 strategy to different intermediate agents, such as Local Development Agencies and vocational training centers, in order to increase the capillarity of RIS3 strategy to SMEs.

Universities also have become more proactive in the RIS3. On the one hand, this has been pushed by the development of a university-business strategy by the Basque Government's Department of Education, which seeks to foster strategic collaboration among universities and firms. On the one hand, the universities themselves have been more closely aligning their strategies with the RIS3. This is seen especially in the Advanced Manufacturing strategic priority through the creation of 'cluster 4gune', a cluster for university training in engineering, science and technology. This initiative, led by the Basque Government's Department of Education and 11 university centres, began its work in July 2017 with the objective of helping strengthen university-business cooperation in the Basque Country under the Industry 4.0 paradigm.

Regarding the *focus of the RIS3 strategy*, while there has not been changes in the general orientation, there has been some increased focusing in almost all the strategic priority areas and opportunity niches. In terms of the characteristics of the projects emerging from the EDP, a general movement 'closer to the market' can be observed and the projects tend to remain confined to the specific areas/niches where they emerged (i.e. they do not usually cross different areas).

Progress on *evaluation frameworks and processes* has been significant since the beginning of this decade, when the OECD (2011), or a little later when Morgan (2013), indicated that the evaluation was one of the main issues left undealt with regarding innovation plans and policies within the Basque Country. In the previous report of Aranguren et al. (2016: 36) it was pointed out that "the Basque Country is now making up for lost time by investing time and energy into a new performance-based system". During the last two years this process of making up for lost time has even accentuated, and the Basque RIS3 has developed a complex system, that combines internal and external evaluation processes. Some internal processes include:

- Evaluation of the strategy, carried out annually, through monitoring of the objectives established;
- Instrument evaluation, through a biannual analysis of the contributions of the main R&D&I programmes to the objectives of the STIP as well as an impact evaluation of the DEDI programmes by SPRI;
- Evaluation of the Basque Network of Science, Technology and Innovation (RVCTI) agents who receive basic funding, carried out annually, with regards to their contribution to the objectives of the STIP;
- Evaluation of the Basque System of STI, through Innobasque Innovation Reports, prepared every two years.

As for the external evaluations, these included reports such as Aranguren *et al.* (2016) and this one, carried out every two years by Orkestra in collaboration with Kevin Morgan from Cardiff University.

These advances in evaluations should be pursued to establish a system of indicators that clearly distinguishes different levels of indicators (expected changes, results, programme and policy outputs and inputs), so that both the strategy as a whole, and each of the thematic and horizontal priorities dispose of their own indicators (Kleibrink et al. 2016; Gianelle & Kleibrink, 2015; Gianelle et al., 2016 and 2019). This requires the design of mechanisms to collect quantitative information consistently, that, beyond subjective or anecdotal assessments, make it possible to determine the real degree of progress in each of the priorities and reassess them accordingly. All of this alongside the progress that each SG is already making in experimenting and developing evaluations adapted to their own circumstances, in which evaluators, public decision-makers and other stakeholders collaborate jointly.

Focusing on the *overall achievements* there has been almost total unanimity by all of those interviewed that during this most recent phase of the RIS3 strategy the initial mistrust and relative skepticism around the principles and prioritizations of the RIS3 have disappeared as the agents started to participate in the different governance arenas. The principles of a RIS3 based on entrepreneurial discovery and the 7 initially selected prioritizations were progressively assimilated and adopted, frequently becoming aligned with the strategies of individual agents. This is largely due to functionality – under a long-term vision – demonstrated by the different spaces for participation and collaboration. None of them have been

considered unnecessary, irrespective of the fact that changes have been proposed to improve their functioning (see previous points on governance). Certainly, the contribution of these spaces is more evident in the areas where previous spaces of the same nature did not exist (for example, in many of the opportunity niches) or in those where several were operating without a clear structure between them (for example, in Advanced Manufacturing). But even in cases where collaboration spaces already existed and operated through the whole priority (such as Energy), these new spaces have added more dynamism and a closer articulation with the rest of the priorities and with the general strategy of the territory.

In this sense, the new collaboration spaces and structures that were created have proved to be a step forwards in the development of the territory's social capital around innovation. The creation of these spaces and the gathering of agents with different cultures, who up until that time had little interaction, allowed the distance between them to reduce, an innovation culture to spread into new fields, and economic sectors up until then ignored by public policies to be included.

Many interviews also signaled that the effort to collect evidence and carry out evaluation processes did not remain as mere exercises to elaborate indicators or diagnostics. They generated awareness of the system's failures which up until then had been unnoticed or under-recognised, and stimulated initiatives and programmes to tackle them. This can be seen clearly in growing sensibility around and initiatives launched to address (especially, from the so-called Innovation Fund): the integration of SMEs; the activation of demand; non-technological innovation; future skills requirements; and the development of projects closer to the market.

Moving finally to the *challenges*, this revision of the three strategic priorities and four opportunity niches reveals that the objectives, working groups and strategic projects have been shaped more by economic-business and technological rationales than by the opportunities opened by key societal challenges (either grand societal challenges or regional ones). Although societal challenges were mentioned in the STIP2020 at the time when the Basque RIS3 priorities were determined, the same cannot be said for the later governance of RIS3 and for the dynamics set up in each of the steering groups.

Equally, it can be observed that the speed and depth of the dynamics set up by the three strategic priorities and the four opportunity niches are very disparate. This is not strange when considering the different scientific, technological and business capacities that exist in each, as well as the previous experience of associations and collaborations. The question arises, in this sense, whether the priority framework set up in the STIP 2020, that had ordered the thematic priorities into three strategic priorities and four opportunity niches should be subject to review.

Indeed, the Advanced Manufacturing and Energy strategic priorities clearly stand out in terms of the level of technological and business capacities, the engineering knowledge base and the scope and depth of collaboration dynamics. On the contrary, Biosciences-Health is a relatively emerging strategic area, with a scientific knowledge base, in which the business capacities are growing. It remains far from constituting a comparative advantage for the region and contains clearly different cultures with almost no previous collaboration record.

A similar distinction can be made among the opportunity niches, where the Food niche is clearly different from the others (Ecosystems, Urban Habitat and Creative and Cultural Industries). It has higher scientific and technological capacities and, although its economic-business capacity is clearly not equivalent to that of Advanced manufacturing and Energy, it is undeniably greater than that of the other opportunity niches. Furthermore, it is apparent that the Ecosystems is evolving into more of a transversal working area. A way forward could be to integrate concern with circular economy into the other SGs and maintain a transversal vision of other environmental issues in common programmes of the respective Department.

What seems to be emerging, therefore, is a transition from the current framework of dichotomous 'strategic priorities' and 'opportunity niches' to a distinction between strategic priorities based on currently existing strengths (Advanced manufacturing and Energy), strategic priorities based on emerging capacities (Biosciences-Health and Food), and strategic priorities based on urban ecosystems (Urban Habitat and Creative and Cultural industries).

In any case, the acknowledgement of such a three-way distinction should not imply the establishment of barriers for collaboration between them. Indeed, progress with regards cross-priority dynamics, up until now primarily channeled through Collaborative Tracking Projects (PTC), is insufficient and remains a key challenge. Recent literature (see Janssen and Frenken, 2019) sets out the advantages for advanced regions from not limiting themselves to drive diversification processes from related knowledge combination (which, for example, could take place due to the interaction of machine tooling and ICT companies, both belonging to the Advanced manufacturing priority), but also to drive the diversification by non-related knowledge combination (for example, for the interaction of advanced manufacturing firms and those of biosciences-health). The latter offers advantages as it is more unconventional and more difficult to replicate. In this way, collaborative efforts should be pursued among firms and organisations that are working in different strategic priority areas.

Lastly, there is strong consensus in the interview data that a reassessment of the current policy-mix is needed. On the one hand, it is necessary to move beyond the subsidy model, which is not easily sustainable in the future, by incorporating new instruments (especially instruments that operate to activate the demand, such as public procurement). On the other hand, it is necessary for the different instruments to function in an aligned or coordinated manner to provide support to larger, more integrated projects. Finally, there is a need for multi-annual financing mechanisms that allow funding of large, long-term projects.

6 EVOLUTION OF EDP IN 3 PRIORITY AREAS 2016-2019

This section analyses the specific evolution of the entrepreneurial discovery process in each of the priority areas during the period 2016-2019. For ease of reference, the analysis for each priority area is summarised according to a common framework in a set of tables included in Annex 3.

6.1 Advanced Manufacturing

Advanced manufacturing was identified by Aranguren et al. (2016) as the most complex priority area, given its combination of capabilities from diverse industrial clusters and the large number of agents involved. The steering group was the first to be set up, in June 2015. It was initially comprised of representatives from the Basque Government (DEDI), from other levels of the administration, from knowledge and technology agents, and from intermediary agents, including four of the key cluster associations (automotive, machine tools, energy and ICT). In the early implementation phase the entrepreneurial discovery process under this steering group was operationalised by five thematic working groups, later extended to seven.

Since 2016 there have been substantial changes in the structure and organisation of the steering group. The initial phase was built around strong institutional involvement from government and intermediary institutions. While it laid important foundations in terms of conceptualisation and reflection around capacities, opportunities and needs, changes were prompted by arguments that a more executive structure with greater direct involvement from the business sector was needed to move from reflection to action.

The structure of the steering group was accordingly changed to an 'executive commission', which is co-chaired by the Minister for Economic Development and a private sector representative that rotates among key firms from the different clusters related to advanced manufacturing. The committee itself is made up of 2 Vice Ministers from the Economic Development Department, 2 representatives from the Basque Science Technology and Innovation Network, and 7 individuals from the private sector (associated with firms that are representative of Basque manufacturing). The commission is supported by an executive director and a technical secretariat comprising people from Innobasque, the Economic Development Department and SPRI.

In terms of the organisation of the work of the steering group, the executive commission meets every three months to coordinate and oversee activity. The activities are developed in three strategic pillars, each of which is led by different members of the executive commission and supported by Innobasque or SPRI:

- **Basque Digital Innovation Hub:** Oriented to generating the conditions for SMEs to advance in Industry 4.0 in specific thematic areas (additive manufacturing, flexible and collaborative robotics, data driven solutions, new materials, cybersecurity and intelligent and connected machines).
- **Training for new employment:** Oriented to ensuring the availability of the right skills for Industry 4.0.
- **New business models:** Oriented to preparing firms for the new ways of monetizing activities emerging with Industry 4.0

Other working groups and dynamics that were active in the previous phase continue to activate "on demand". For example, while the cluster associations are no longer directly part of the steering group executive commission, there is an inter-cluster forum. This has not yet met formally, but cluster associations are called on at specific moments (e.g. for revising the map of key enabling technologies developed in the training pillar or working on new business models). There is also an *ad hoc* working group on internationalisation that periodically brings together technology centres, business R&D centres and SPRI in a forum for debate around EU programmes.

A key theme throughout the Basque RIS3 process has been acknowledgement of the need to involve SMEs and

entrepreneurs in the dynamics. In this regard the movement from reflection to action has corresponded with a focus on meeting the needs of SMEs. Indeed, while the private sector individuals present in the executive commission are all associated with large firms, they are appointed in an individual capacity and they are universally clear that the focus of all three pillars is on supporting SMEs: "large firms are not going to solve their problems in the steering group; the focus is on SMEs". The direct involvement of SMEs in the activities of the three pillars is currently seen in the Basque Digital Innovation Hub but is progressing very slowly. This is acknowledged as the key challenge as the activities of the three pillars progress.

The Education Department or the universities are not directly represented in the steering group, whose restructuring has also led to fewer technology centres being represented on the executive commission. However, all of the technology centres are directly involved in the activities of the Basque Digital Innovation Hub, and there has been a significant development in terms of the overall engagement of universities and training institutions through the establishment of Cluster 4Gune. This new initiative bringing together key educational actors has provided a focal point for engagement in the training for new employment pillar.

Despite the move from five working groups to three pillars, the overall focus of the strategy has been fairly stable, essentially following the Basque Industry 4.0 Strategy of 2012. A development that can be observed, however, is gradual movement towards an even more horizontal approach, rather than a more specific thematic targeting of activities. The three pillars are all fundamentally horizontal, with their activities explicitly oriented to creating the conditions – e.g. through socializing the use of 4.0 technologies, cataloguing 4.0 assets and activating demand – for Basque SMEs to thrive across the spectrum of Industry 4.0. Within this horizontal approach there is an ongoing shift towards projects that are closer to the market (exhibiting higher TRLs), as seen for example in the Basque Digital Innovation Hub, and the Bind 4.0 programme is playing an important role in connecting firms with innovative, entrepreneurial solutions to their Industry 4.0 challenges. While the activities of the New Business Models pillar remain at a very early stage, their prioritisation also signals intent to take non-technological innovation more seriously as part of the strategy.

In terms of evaluation, each of the pillars will ultimately have its own monitoring framework (the framework for the Basque Digital Innovation Hub is already developed). There are also evaluation activities underway in SPRI that are strongly related with this priority area, for example an impact evaluation related to the HAZITEK programme. Lack of resources remains a barrier to more comprehensive and sophisticated evaluation activities.

Overall the advanced manufacturing steering group is consolidating a systemic dialogue between public and private sectors. It has evolved since 2016 towards a more executive approach in support of horizontal activities oriented to strengthening how SMEs approach Industry 4.0. Digital innovation, training needs and new business models are the areas that have been prioritized, with the Basque Digital Innovation Hub the most advanced initiative (six nodes have been defined and two of them are now active and provoking cooperation between technology centres and firms). There have also been important advances in the analysis of training needs among Basque industry, and the parallel coordination of training agents towards an inventory of capacities (through Cluster 4Gune). While activities related to new business models are still at an early stage a concrete proposal has been developed based on sensibilization of the need for new business models, methodologies to identify opportunities, a catalogue of experts/solutions and the identification and generation of demonstrator cases.

From these foundations, key challenges will be to develop a critical mass of actions in each of the pillars and increase the engagement of SMEs. It will also be important to work towards a culture of long-term innovation, backed by stronger investment in large projects that will have a long-term impact and the activation of more sophisticated demand. There are also ideas to add new pillars with a more specific focus on key themes such as the circular economy or artificial intelligence that will be critical in shaping advanced manufacturing over the coming years.

6.2 Energy

The definition of the energy priority was built from the very beginning on pre-existing cooperation dynamics in the Energy Cluster Association (ECA) and on the framework of the EnergiBasque strategy (Aranguren et al., 2016). These have remained core elements of the activities of this priority area, but the dynamics have evolved in the last couple of years following an alive and flexible process. It is not a case of radical change in the strategy, but rather of including some new elements that support the ongoing development of the energy strategy.

The first element, and perhaps the most important, has been the inclusion of leading companies from the sector in the Steering Group. These companies are not only large but are globally leading companies. Their engagement with SMEs around innovation and product development activities is facilitating the inclusion of SMEs in the dynamics of the priority area in this second wave. Moreover, it is not only SMEs from the energy sector that have been incorporated into the strategy development, but also SMEs from other sectors, especially from the ICT industry. These companies have seen the advantages of being involved in the working groups of the energy priority as some of the key dynamics in this area are linked to digitalisation.

A second element that might be highlighted is the greater involvement of universities in this most recent phase, as compared to the previous phase. Although the process of involvement has differed among the universities involved in the energy strategy, the working group dynamics count now with the engagement of three universities (EHU-UPV, Deusto, Mondragon University), which complements the capabilities of the still active research and technology centres.

In addition to these changes in actors' involvement, which might be underlined as the most significant change in the energy strategy in this period, the strategy itself has also evolved. While the focus of the strategy has not substantially changed, there has been a reorganisation process of technology lines, horizontal activities and strategic projects. These have led to the identification of three new value chains (offshore energy, smart grids, resource efficient manufacturing) around which the strategic focus is being articulated.

The articulation of the steering group activities is built around three types of projects.

- **R&D projects**, which are submitted and developed through public R&D programmes, such as Hazitek or Horizon 2020.
- **Strategic projects**, led by the lead companies that have been incorporated into the steering group. These projects are bigger and more ambitious than in the previous phase. They are also closer to the market and are often 'demonstration projects' in which SMEs are also involved. These projects are funded not only by public support but also by the firms' private investments. They are the main outcome of the working groups, which constitute the basis of the entrepreneurial discovery process.
- **Horizontal activities**, developed by the cluster association, which continues leading the priority and facilitates the development of a shared strategic vision across the whole area. Among these horizontal activities, talent and training challenges have emerged as key priorities, together with new markets and business model innovation. Indeed, one of the pending challenges for the future in this area is how to integrate non-technological issues to technological development, especially the ones concerned to social aspects and challenges.

The energy strategy is highly connected to European Union networks, initiatives and projects. Despite recognition of the importance of being in those networks, the concrete benefits from engagement in them are not so clear. However, it is considered a medium-long term strategy.

During 2019 the steering group is now conducting a review process of the strategy, with the aim of maintaining the strategic process fresh and alive. The involvement of new actors, and especially leading firms, has been one of the main achievements of the period 2016-2019, but the incorporation of more new actors and businesses is considered an ongoing challenge. As mentioned before, the focus of the strategy has been articulated through close-to-market and demonstration projects, which are more ambitious than those of previous phases. Despite this, the launch of even bigger, more integrated

projects is foreseen as a future challenge, something that will require supporting policy instruments. These projects are seen as ‘country investments’ that also seek to integrate other strategic priority areas in order to generate critical mass and leverage more radical innovation outcomes. Finally, there is a specific challenge identified related to energy transitions, and more generally to the integration of market and social issues into the currently predominant technological focus of the activities.

6.3 BioHealth

The strategic priority of BioHealth differs from the other two due to its stronger scientific base (as opposed to engineering prominence), its emerging nature, the combination of the economic field with that of healthcare and a business base that, as well as being much smaller, is also of a different nature (with the presence of more technology based start-ups).

All this has affected the evolution of the SG over the last two years. The firms have not played a direct role in the SG, participating only through the different working groups and, indirectly, through the Basque Health Cluster. The Department of Health has continued to lead the SG, even though economic development is not its main rationale and the central economic supporting instruments correspond to another Department. The provincial councils have recently been incorporated, but without causing significant changes either in the functioning of the SG or in the performance of the provincial councils in this field. Also, in the last couple of years two universities have joined the SG. However, alongside the fact that other universities are still absent, the role of these two universities has not been very active and there is still the need for a coordinated and joint approach by all of the universities in the field of Biosciences-Health, similar to that seen in the Cluster 4Gune in Advanced Manufacturing. Additionally, there has not been progress in terms of the engagement of actors representing users, such as medical or patient associations.

In parallel to these changes with regards to the main actors, there have been notable changes in the institutional structure of the SG, partly due to the priority's characteristics (emerging nature, small collaborative culture between actors, belonging to different fields...). One working group (Big Data) has disappeared and integrated into another (Digital health and medical devices), while another new group (Neuro) and two transversal actions (New business model and Training) have emerged. Management problems have caused others to generate subgroups (Personalised medicine) or to create delegated committees (Neuro). There have also been changes in the coordinators of some groups (one firm, Oncomatrix, has substituted the cluster association in this role). However, all these changes have responded to partial reassessment instead of a joint and systematic reassessment of the institutional structure of the priority, which up to a certain point lacks coherence and seems to respond to more of a health rationale, than an economic development rationale.

Also when referring to analysis of the structure and actors, reference should be made to confusion related to: the delimitation of functions between the role of the Basque Health Cluster and the functions that are carried out by some of the working groups; the presence and role that some organisations (for example, Osakidetza or the medical device companies) should have within the cluster association and in the SG; and even the Basque Health Cluster's own role in the SG.

During the last two years this priority has advanced mainly in the field of Digital Health and Medical Devices. Most of the business fabric linked to the priority is found in this field and has also experienced a notable growth in the Basque Health Cluster association, which has incorporated firms, mainly from Gipuzkoa, who up until then had operated separately.

As far as strategic initiatives go, there are two that stand out for their potential: public procurement and Innosasan. What Basque firms ask for and need is not so much what in strict sense is called “innovative public procurement” but what Uyarra and Flanagan (2010) call “innovation friendly public procurement”, which looks to open markets. The initiatives that have been attempted in the Basque Country are more “pre-commercial innovative public procurement” than “innovation friendly public procurement”, which were less responsive to the needs of the Basque firms. Furthermore, due to the way they have been introduced (i.e. small amount of assigned funding), they have not been successful. For the development of this priority this is a key instrument, and there are important questions surrounding its financing.

Innosasun is an instrument through which the Basque system offers advice for the development of new products, validation and demonstration studies, data and biological sample supply and access to Biobanco. Due to the support for this instrument from the Innovation Fund, over the past two years the interaction and collaboration between the Basque public health system and industry, as well as other related agents, has been facilitated, and more than 50 entities have been supported. However, the lack of instruments of complementary financial support has seriously limited its effectiveness.

Since its third edition, the programme BIND 4.0 has also been applied to the health field, to promote the necessary contact between lead firms and small firms. While 7 start-ups have been selected in that edition, some interviewees consider that its conditionality to the Industry 4.0 and the exclusion of firms with foreign capital from these contacts has seriously limited its impact. And equally the impact of Baliosasun, another strategic initiative of the sector, has been rather marginal.

However, although the success achieved by the strategic initiatives is questionable, what seems undeniable is the success obtained by some business initiatives in this field as well as the growth rates in the number of firms in the Basque Health Cluster (from 26 in 2016 to 68 in 2018).

As for the evaluation, it has taken on an informal character, based on meetings with the respective coordinators for the different working groups to assess and redirect their actions. Based on this, some reorientation decisions have been made. But there is a lack of a structured and permanent evaluation system, that allows a joint evaluation of the priority and its impact.

7 EVOLUTION OF EDP IN 4 OPPORTUNITY NICHES 2016-2019

This section analyses the specific evolution of the entrepreneurial discovery process in each of the opportunity niches during the period 2016-2019. For ease of reference, the analysis for each opportunity niche is summarized according to a common framework in a set of tables included in Annex 4.

7.1 Food

Basque cooking enjoys a reputation for being one of the best cuisines in the world and the good quality of Basque food is one of its key assets. Food has been an integral part of industrial production of the Basque country, including sub-sectors such as agricultural products and services, machinery equipment, processed food, gastronomy, beverages, etc.. The Basque Culinary Center, for example, has become a key player and is actively promoting the food culture, regionally and globally.

As Aranguren et. al. (2016) highlight, the opportunities that appear through the support of the food niche are on the one side addressing social and demographic challenges related to longer and healthier lifestyles and on the other side preserving the Basque eco-system and natural resources. Connected with the first one, the food value chain has shown close links with the BioHealth priority area (alternative or innovative medicine or systems of health support).

The Steering Group for the development of the RIS3 Food opportunity niche was formed in July 2015. The Department of farming and fishing of the Department of Economic Development and Infrastructures (DEDI) leads this opportunity niche with a high collaboration from the RTO AZTI. At the start of the RIS3 process, a value chain analysis supported the Steering Group in defining six working groups and lines for research support:

- Healthy Food,
- New Food Production Systems,
- New Gastronomic development for special society groups,
- Safe and quality food – new technologies of conservation,
- Integration of ICT technologies in the production, logistics and commercialization processes,
- Food with new benefits resulted from enhanced technologic application and consumption trends.

Within these six groups, the first four have a more vertical character, while the two later ones are transversal.

There have been five main changes in the most recent phase of the development of the RIS3 (2016-2019):

1. A higher involvement of firms and SMEs;
2. A focusing on three research lines: healthy food, new production systems and ICT;
3. Demands by firms for a higher degree of focus in the strategy with each of the working areas (for instance, in Healthy Food the focus was on the glycemic index of obesity, food safety in ICTs...).
4. More demand-oriented and closer-to-market projects emerging from the working groups, accompanied by the technological centers adapting more their capabilities towards firms' demands.
5. Higher awareness of non-technological innovation, especially marketing and design innovation regarding consumer behaviour to couple with more demand-oriented research.

The Food steering group has considered as a strategic initiative the participation of AZTI and Angulas de Aguinaga in EIT Food, an international consortium that carries out pioneering initiatives in innovation, entrepreneurship and education, supported by the European Institute of Innovation and Technology (EIT). Since its beginnings, talents (students and researchers) have been identified and trained in the Basque Country to carry out business projects that respond to global food challenges; and with the EIT Food Accelerator Network in 2019 an international call was made to which more than

300 applications were received, of which 60 were selected, 12 in the Basque Country. Furthermore, the fourth edition of BIND 4.0 has been opened to start-ups that develop solutions based on technologies 4.0 for the food value chain.

Five indicators were defined to monitor the evolution of this opportunity niche. The main achievement of this opportunity niche has been the increase in the involvement of firms and in the focus of the strategy, which in turn is supporting the emergence of projects that are closer to the market. But the main challenge is to widen this involvement of firms, and in particular to spread the innovation culture among more firms.

7.2 Ecosystems

The steering group for the ecosystems opportunity niche was established in July 2015, bringing together public agencies (SPRI, IHOBE), cluster associations (ACLIMA, HABIC), technology and research centres (Tecnalia, IK4, Basque Centre for Climate Change), the University of the Basque Country and a network of municipalities (Udalsarea). Six priority lines were initially identified, and while the steering group was open to participation from interested parties, already in 2016 difficulties were being detected in attracting participation from business (Aranguren et al, 2016).

Since 2016 there have been a series of changes in the steering group, primarily in response to recognition of the need for wider and deeper participation, in particular from business, a more industrial (rather than environmental) focus, and stronger links to other steering groups. Mondragon Corporation (MCC) and the Energy Cluster have both joined the steering group, and there have been changes in some of the representatives (from the technology centres).

SMEs are engaged in the activities of the opportunity niche fundamentally through their participation in projects and instruments promoted by IHOBE under the innovation fund. In this sense IHOBE has played a strong leadership role regarding all of the activities, and their team have close contact with business through these instruments, making 30-40 visits a month to SMEs. The programmes are fairly generic, however, and there remains a lack of more strategic involvement of SMEs or indeed larger firms in shaping the direction of the opportunity niche, despite the existence of some other forums such as the Basque Eco-Design Centre.

The technology centres, on the other hand, are strongly involved in the steering group. However, their interests do not always coincide with the desired business-oriented focus of the activities, and there has been concern that their vision has been too focused on the environmental dimension of the niche and lacking a more transversal industry-focused perspective. As a measure to remedy this, changes have been proposed (and made in the case of IK4) with regards the specific representatives that participate in the steering group. Mondragon University and the Centre for Environmental Studies (in Vitoria) have also joined the group.

In terms of the strategy itself, the focus has become split along two lines, each of which has convened a temporary working group of specialists:

- **Circular economy**, which is linked to the development of the Basque Circular Economy Strategy.
- **Ecosystems**, which is currently in the process of defining strategic priorities for 2019/2020

The strategy is currently being focused through the working group dynamics in these two areas, and with input from a questionnaire to steering group members in 2018. It is possible that other working groups could emerge in the areas of knowledge transfer (training, skills, SMEs) and eco-innovation.

The activities of the opportunity niche are built around three types of small projects (funded by IHOBE, through the Innovation Fund), designed to serve as catalysts in the development of larger projects to be funded by SPRI and/or H2020.

- Demonstration projects are oriented to close-to-market activities (TRLs 8 and 9).
- Eco-innovation projects tend to be further from market (TRLs 5 and 6).
- Design excellence projects are specifically oriented to support the development of proposals for EU funding.

Indeed, while IHOBE is active in several EU forums (manufacturing and raw materials KICs and forums on circular economy and ecological footprint), and technology centres are heavily involved in EU projects, there is an acknowledgement that firms need to take greater advantage of EU projects.

There is an important focus on non-technological innovation within the steering group activities, built around IHOBE's interaction with firms in methodologies of eco-design, servitisation & strategic prospecting. The Basque Eco-Innovation Hub also plays a key role in this regard, through workshops and by matching student internships with companies.

There is strong awareness of the need to evaluate the activities of the steering group. This is reflected in the 2018 survey of steering group members, and in the ongoing project evaluations conducted by IHOBE which estimate the impacts in firms at the start of the project, at the end and after 3 years.

Overall, the period 2016 to 2018 has seen important adjustments to the steering group and the focus of the activity, in particular with regards to positioning the circular economy as a core transversal area for innovation. These developments have also helped to focus the activities of IHOBE itself, and the innovation fund has enabled first steps to finance small projects with firms. Scaling up the level of investment will be a key challenge going forwards, alongside a more integrated approach that builds links with other steering groups and creates greater understanding among firms and within government around the transversality of circular economy.

7.3 Urban Habitat

The Urban Habitat opportunity niche has undergone several changes in the last period. These changes are mainly a reflection of the leadership change of the steering group. In May 2015, it was the Housing Directorate of the Basque Government (from the former Department of Employment and Social Policy) that led the formulation of the urban habitat opportunity niche, which resulted in the establishment of a steering group in June 2015 with a broad institutional diversity in representation, which included, among others the Department of Environment and Territorial Planning (Aranguren et al., 2016).

In 2017, with the new government the Department of Environment was restructured to include not only territorial planning but also housing. Due to this restructuring process, the Directorate of Territorial Planning, Urbanism and Urban Regeneration assumed the leading role of the opportunity niche with the support of Housing. This change also led to a change in the strategy focus. Thus, the opportunity niche is now focused on integral regeneration of vulnerable neighbourhoods while in the previous years the focus relied on sustainable construction.

As a consequence of the change in the strategy focus, the organisation of the niche experimented changes. New actors were included: cluster associations not previously involved (such as GAIA or ACLIMA), representatives of the Basque Government from other departments (Social Affairs, Health, ...) and a greater presence of advanced services firms (engineering, architecture). Another significant change is that the niche started to be organised around pilot projects, which are transversal in nature, getting rid therefore of the existing working groups. The pilot projects are conceived as demonstration projects, close to market and therefore with high TRLs.

The new orientation of the strategy has meant that some actors that were very active in the previous phase, such as the technology centres or some material producers from the construction sector, are less present in the current phase. In the case of the technology centres this might be explained by the nature of the demonstration projects, which are not so much research oriented. However, the university participates in some of these projects. Despite the orientation towards more holistic projects around urban regeneration, which are very close to social issues, the involvement and engagement of social actors is still an area of improvement. In the same line, the new orientation of the projects, which come from the government side leads to a lesser margin of manoeuvre with regards the active engagement of SMEs and entrepreneurs. In addition, the projects that are being developed have indirect links with EU initiatives and projects. They are running in parallel although thematic issues are similar to some extent.

Given all this, the changes produced in the last period together with the opportunity that a strategy such as RIS3 gives to this area has meant that innovation has been introduced in the urban habitat agenda in the Basque Country, something that can be considered a great achievement. The holistic and integral view that is emerging and reflected in the definition of demonstration projects is a further achievement. However, this approach has a trade-off in the definition of research-oriented projects. Another accomplishment is that cooperation practices with other priorities or opportunity niches have been established through the participation in specific projects, especially with the Ecosystems and Health SGs.

This transversal feature has however disadvantages. Getting rid of the working groups has led to more integration but the SG is now composed of around fifty people, which makes the group difficult to manage. In addition, one of the challenges for this area is to concentrate on fewer and bigger projects which could be seen as ‘country bets’. Demonstration projects need more funding in infrastructure, for example, and these should be better aligned to strategic lines. In this sense, digitalisation appears to be an important trend for the future that should be better incorporated in the agenda. Finally, in order to assess the potential of this area as opportunity niche, evaluation processes should be conducted, as they are currently not in place.

7.4 Creative and Cultural Industries

Creative and Cultural Industries (CCI) comprise a variety and wide range of sub-sectors and segments with territorial embeddedness both in the European landscape and the Basque Country. In the Basque Country creative and cultural industries are composed of segments such as audio-visual and digital content, video games, fashion, design, performing arts, music, cultural heritage and language industries. The steering group of this opportunity niche was constituted in November 2015, led by the former Department of Education, Language and Culture (DELIC). It started by defining what creative and cultural industries are, defining which sectors could be included in the concept of CCI, and exploring and understanding the role of other territorial levels in this area, with a strong rooting at the city level (Aranguren et al. 2016). Indeed, the representatives of the three major Basque cities participate in the SG of the niche together with representatives of the three provincial councils. Therefore, CCI is an opportunity niche dispersed in many sectors and embedded in a multi-level governance context.

One of the challenges of the previous period was to integrate the cultural industry with the creative view. This industrial fragmentation is also reflected in the governance within administrations. Thus, the cultural industry is more related with cultural value and dependent on culture related bodies while creative industry is more linked to economic development and support policies depend on different government bodies. Given this situation, it is important to involve in this niche’s steering group government representatives from both the cultural and economic development sides. This constitutes one of the changes in the last period as the Department of Economic Development and Infrastructures (DEDI) from the Basque Government is now an engaged partner together with the Department of Culture and Linguistic Policy (DCLP). This is a remaining challenge for the rest of the government levels involved in the SG.

The search for integration of Culture and Creative Industries following a multi-level approach is reflected in the actions that the SG, led by the Basque Government, has been promoting in the last period. These are mainly:

- Mapping the CCI policy-mix in the Basque Country, including all the initiatives from different administrative levels.
- Integrating creative and cultural industries in the statistics operations by EUSTAT (Basque Statistics Institute).
- Launching the KSI Berritzaile support programme
- Coordinating a European Interreg project on CCI (Creadis3).

KSI Berritzaile deserves special attention as it acts as a bridge between the SG and other territorial actors. It is a support programme organised through three lines, which has served to spread innovation among the industry:

- Innovation and technology transfer: In this line, technology centres act as nodes that engage with SMEs. SMEs are not present in the SG and this is the link for them to be involved. A future challenge is how to incorporate them directly.

- Organisational innovation, in which Euskalit is the main node
- Finance innovation, with the support of Elkargi.

Therefore, apart from the governments involved, this niche is characterised by the direct engagement of technology centres and other agents (clusters associations are also involved but not with a strong role), while other actors are engaged indirectly (SMEs and entrepreneurs) and others, such as the universities are missing. A future challenge is to incorporate these actors and a greater integration and involvement of existing members of the SG (such as a better integration of other administration levels and between the culture and the creative sides). However, this engagement is foreseen to be articulated through working groups, given that the current size of the SG (around 50 members) is not manageable and the frequency of the meetings is not adequate to develop the niche (nowadays it is more an information exchange than an entrepreneurship space). This new organisation would reflect the prioritisation of the sub-sectors within CCI, which also is a pending challenge and will constitute the Basque District of Culture and Creativity (BDC2). The BDC2 will include a 'one-off window' in SPRI for CCI programmes and services, which will help in the industry integration.

8 ANALYSIS AND CONCLUSIONS

The previous chapters have contained analysis of the general evolution of the Basque RIS3 in the period 2016-2019 alongside detailed analysis of the evolution of each of the steering group dynamics. Combining this analysis leads to the summary contained in the table below, which distinguishes between the evolution in organization/structure, actors, strategy, evaluation, achievements and challenges observed in the strategic priorities, the opportunity niches, and overall.

With regards **organization and structure** there have been significant changes in governance across both the strategic priorities and the opportunity niches, reflecting an approach of experimenting ‘what works’ and adapting. This represents the consolidation of a shift towards a ‘living strategy’ that was observed in the initial implementation period, with the steering groups now seen to be providing effective spaces for experimentation and change that then feed into the wider strategy governance (e.g. through the inter-departmental committee, BCSTI, SAC and advances in multi-level governance). Moreover, while government continues to take strong leadership in the opportunity niches in general, the strategic priorities have seen more of a ceding of power to others, signaling a movement towards more distributed leadership (Aranguren *et al.*, 2017).

These developments in organization, structure and governance respond directly to one of the key issues for the ongoing development of RIS3 strategies that we identified in Chapter 2: the experimentalist polity. Indeed, the evolution of the Basque RIS3 over the last few years demonstrates how RIS3 governance can be kept alive and open to continual experimentation and change. While there remains some road ahead for a truly radical shift in the political culture from hierarchical bureaucracy to more porous and experimentalist polities, the fluidity of the process and changing leaderships signal that the journey has clearly begun.

In terms of **actors**, the stand-out trend across all SGs has been the greater involvement of firms through their participation in working groups and projects, alongside increased awareness of the importance of integrating SMEs. While the role of cluster associations in linking to SMEs has been stable across the opportunity niches, in some of the strategic priorities (particularly AM) there has been an evolution towards more of a background role, responding on demand to specific issues. There has also been an activation of capillarity focused around this need to integrate SMEs, through the link between Innobasque and local economic development agencies. Another key change has been the shift in the proactivity of the universities, which are beginning to engage more directly in the strategic priorities and starting to participate in specific projects within the opportunity niches. Their involvement in working groups and projects is combined with moves to align their own strategies to the RIS3 and new mechanisms of governance within the university system (e.g. Cluster 4 gune).

These developments go some way to responding to the further reform of research and innovation systems, which was identified in Chapter 2 as a key pan-European challenge for RIS3. The need for this reform is rooted in building stronger synergies between knowledge institutions and business and ensuring that skills development needs are met. In that regard these advances in the engagement of Basque universities in the RIS3 are important, as is the parallel engagement of the vocational training system, for example in the skills for new employment pillar of the AM steering group or the provision of technical services to SMEs by the Tkgune programme.

In common with other places (Kroll, 2017), there has not been much progress, however, in terms of the integration of the most ‘novel’ set of actors, from civil society, into RIS3 processes. Indeed, civil society actors are noticeable in terms of their continued absence across both strategic priorities and opportunity niches. Except for the Bind 4.0 programme, it is also hardly noticeable the presence of entrepreneurs in the RIS3 dynamics.

The **strategy** itself is in a process of ongoing adaption, reflecting the shift to a ‘living strategy’. Yet within that there is a clear

emergence of different speeds and depths of steering group dynamics, and a perception that there remain insufficient connections across the different areas. In the strategic priorities the actual strategic focus of the activities has not changed significantly, although there are signs of AM moving towards a more horizontal strategy and some evidence of greater thematic focusing in Energy and Bio-Health. In the opportunity niches, on the other hand, the key change is from reflection to action, encompassing a focusing of the strategy in most cases and put into practice through the development of small projects. Across all steering groups there has also been movement to projects with higher TRL levels, and most also demonstrate increasing recognition of the need for a greater focus on non-technological innovation (e.g. through new business models). Again, across all steering groups, there is a perception that the Basque Country is strongly on the EU map, with engagement in EU initiatives serving different purposes: from valuing the importance of 'being there' with few tangible impacts in the strategic priority areas; to the key role that certain EU projects are playing in the development of some of the opportunity niches).

Evaluation practice (or lack of it) is a theme that in the past has featured in criticism of Basque innovation policy (OECD, 2011; Morgan, 2013), and is also identified above as one of the six key pan-European issues for RIS3 if it is to be rendered more transformational. It appears that these messages have been heard and are being acted upon in the Basque Country. There have been important advances in evaluation practice within the RIS3 over the last three years, building on a combination of internal and external inputs and including a systematic process to annually evaluate the overall strategy through an indicator framework. There are also diverse processes under experimentation to evaluate activities and their impacts in almost all of the steering groups, which provides a promising foundation for the next step: the integration of approaches to be able to assess the contribution of different priorities and move towards more comprehensive 'diagnostic monitoring' that supports experimentation (Sabel, 2016; Morgan, 2018). But the most important point is that all these attempts to collect evidences about the progress in the process have led to take actions and have not been mere formal exercises.

In terms of the **overall achievements and challenges**, the points summarized in the table lead us to the identification of six core conclusions that stand out from our analysis of the evolution of the Basque RIS3 over the last three years, and that might form the basis for recommendations with regards its future development.

Table 1: Summary of the evolution of the Basque RIS3

	Priorities	Opportunity Niches	General
Organisation / Structure	<ul style="list-style-type: none"> ▪ Clear changes in governance, demonstrating flexibility ▪ Government leadership in changes, but ceding power to others ▪ Experimenting with 'what works' and changing accordingly 	<ul style="list-style-type: none"> ▪ Clear changes in governance, demonstrating flexibility ▪ Strong leadership from administration ▪ Experimenting with 'what works' and changing accordingly 	<ul style="list-style-type: none"> ▪ Evolution of 'living strategy': <ul style="list-style-type: none"> ○ Steering groups providing spaces for experimentation and change ○ BCSTI and Advisory Group adapting their roles ▪ Efficient top-down coordination mechanisms <ul style="list-style-type: none"> ○ Inter-departmental committee ○ Inter-institutional committee ▪ Advances in multi-level governance with some gaps in terms of bottom-up integration
Actors	<ul style="list-style-type: none"> ▪ Differences in approaches to integrating business perspectives ▪ Greater involvement of large firms in general ▪ Greater involvement of SMEs, specifically through participation in programmes and WGs ▪ Change in role of cluster associations: evolution to 'background role' facilitating other leaderships, linking to SMEs & responding "on demand" to thematic challenges ▪ Lack of involvement of other levels of administration (except in BioHealth) ▪ Technology centres continuing to assume a clear, active role ▪ Universities beginning to engage more, through experience of Cluster 4Gune ▪ Continued absence of actors from civil society 	<ul style="list-style-type: none"> ▪ Differences in approaches to integrating business perspectives ▪ Greater involvement of SMEs, specifically through participation in programmes ▪ Greater presence of cluster associations; stable in their role linking activities of SGs to SMEs ▪ Advances in terms of administration working across departments/levels ▪ Technology centres less active (except in Food) ▪ Universities starting to participate in some projects ▪ Continued absence of actors from civil society 	<ul style="list-style-type: none"> ▪ Greater involvement of firms through working groups and projects ▪ Increase in awareness of importance of integrating SMEs and adoption of actions to facilitate their involvement ▪ Lack of integration of entrepreneurs in RIS3 dynamics in general ▪ Activation of capillarity through link between Innobasque and intermediary agencies (e.g. local development agencies) ▪ More proactive engagement from universities in RIS3 dynamics <ul style="list-style-type: none"> ○ Involvement in working groups ○ Alignment of university strategies ○ New governance of university system (e.g. Cluster 4Gune) ▪ Continued absence of actors from civil society

PLAYING THE LONG GAME: EXPERIMENTING SMART SPECIALISATION IN THE BASQUE COUNTRY 2016-2019

<p>Strategy</p>	<ul style="list-style-type: none"> Updating of strategy, but no significant change Advanced manufacturing moving towards more horizontal strategy, while some evidence of greater thematic focusing in Energy & BioHealth Move towards projects with higher TRL levels in general Stronger recognition of importance of non-technological innovation (e.g. new business models), but no major advances Actively involved in EU networks and value importance of 'being there', but few tangible effects locally 	<ul style="list-style-type: none"> Focusing of strategy From reflection to action, facilitated by innovation fund Evolution through development of small projects Move towards projects with higher TRL levels in general Greater focus on non-technological innovation Increasing involvement in EU networks and projects (such as INTERREGs) playing important role in development of activities 	<ul style="list-style-type: none"> Ongoing adaption of strategy through dynamics in steering groups: from fixed plans to a live strategy Emergence of different speeds and depths of steering group dynamics Move towards projects with higher TRL levels in general Greater recognition of the importance of (and some emerging experiences with) non-technological innovation Lack of connection across steering groups Need for finance for large, integrated and pluri-annual projects Strongly on the EU map, with engagement in projects/initiatives playing different roles
<p>Evaluation</p>	<ul style="list-style-type: none"> Presence of evaluation activities in all areas, at different stages of sophistication and development 	<ul style="list-style-type: none"> Actively developing data-sets and frameworks for evaluating their activity and impact 	<ul style="list-style-type: none"> Important advances in evaluation on previous phases Combination of internal and external evaluation inputs Systematic process activated to annually evaluate overall strategy (indicator framework) Diverse processes under experimentation to evaluate activities of each steering group Need to integrate approaches to evaluate contribution of different priorities
<p>Achievements</p>	<ul style="list-style-type: none"> Consolidation of governance structures for collaboration Collaboration and systemic dialogue across different actors Development of demonstration projects with high TRLs Greater alignment of universities Stronger involvement of private sector 	<ul style="list-style-type: none"> Articulation of strategies Incorporation of innovation into sectoral agendas Mobilization of the innovation fund to start working with firms Collaboration across government departments Development of small projects moving closer to the market 	<ul style="list-style-type: none"> Evolution of long-term and flexible spaces for collaboration Advances in culture of innovation, raising sensibility around: <ul style="list-style-type: none"> Integration of SMEs Activation of demand Non-technological innovation Skills for the future Development of projects that are closer to market Greater engagement and alignment of universities
<p>Challenges</p>	<ul style="list-style-type: none"> Develop larger projects with a longer time horizon Better-adapt funding mechanisms Integrate social challenges Stronger collaboration between priority areas and opportunity niches 	<ul style="list-style-type: none"> Create a more executive structure (oriented to experimentation and action) Develop larger projects Increase funding Stronger collaboration between priority areas and opportunity niches 	<ul style="list-style-type: none"> New framework for priorities: Adapt strategy to different speeds and depths of dynamics Integrate societal challenges into the strategy Stronger collaboration between priority areas and opportunity niches Reconsider policy-mix to support larger, pluri-annual projects and activate demand Extend entrepreneurial discovery process to engage a wider set of voices

Changing configuration of priorities

When the steering groups for each of the three strategic priorities and four opportunity niches were initially set up in 2015, they were established under certain 'rules of the game' within which they had considerable freedom to evolve their own distinctive trajectories (Aranguren *et al*, 2016). This space for experimentation and change has been capitalized upon, fueling a 'living strategy' within which different speeds and depths of steering group dynamics can be accommodated. A natural consequence of this would be a fluidity over time in terms of the configuration of the priorities themselves. Indeed, a transition seems to be emerging from the current framework of dichotomous 'strategic priorities' and 'opportunity niches' to a more nuanced distinction where we have strategic priorities based on currently existing strengths and an engineering knowledge base (Advanced manufacturing and Energy, with circular economy as a core transversal element), strategic priorities based on emerging capacities and some shared knowledge bases (Biosciences-Health and Food), and strategic priorities based on urban ecosystems and a symbolic knowledge base (Urban Habitat and Creative and Cultural Industries).

The natural emergence of new configurations in this way is important because it shows that the Basque EDP is alive and pivoting to remain relevant to an ever-changing reality, which is inevitably conditioned by both internal dynamics and external forces. This is the very opposite of more typical 5-year plans that are set in stone and tend to become irrelevant as a result. A living strategy that can accommodate and embrace changing configurations of priorities is also much more likely to be able to acknowledge and calibrate the different roles from government – as provider, purchaser, regulator, investor – that are required in different balances as priorities change over time.

Horizontalization of strategy

There is increasing **horizontalization** within the Basque RIS3, which is evident in the growing attention from steering groups around four key levers: internationalization, training and skills, new business models and entrepreneurship. To that of internationalisation (present from the beginning and which is dealt with in another section), new business models have been added (this is due to the growing awareness that the competitiveness of the priority areas doesn't lie exclusively in the identification and prioritisation of the fields' main technologies), alongside training (spurred by the growing difficulties found by firms to find adequate professional profiles within the market, as well as the changes that new technologies pose with regards to workers' skills) and entrepreneurship (which is closely linked to the approximation of entrepreneurial projects and start-ups, especially those based on new 4.0 technologies, to combine with firms that operate in that priority). Advanced Manufacturing has frequently explored ways to progress in these horizontal areas and, in view of the positive results, the other steering groups have tried to work in a similar way in their respective areas. The advance of these horizontal areas generates conditions more favourable to advance in vertical priorities in which each priority field or market niche is focused.

Involvement of SMEs

The involvement of SMEs remains a huge challenge for every region in Europe and post 2020 research and innovation policy in the EU will have to make greater efforts to design schemes and more streamlined regulations to enable SMEs to play a bigger role. Large firms can also help by encouraging their supply chains to become more directly involved. In the case of the Basque Country, there has been significant progress in the integration of SMEs into the RIS3 dynamics, with large consciousness of the importance of doing this and the barriers involved.

As the implementation of RIS3 advanced, progress was made to involve the main firms of each field in the different steering groups. However, amongst both governmental representatives and large firms an awareness grew that the major problems

and need for support were more related to SMEs and entrepreneurs. Consequently, and even though in most of the steering groups SMEs do not have a direct role, the programmes and initiatives that are devised are directed mainly at them. For this reason, on the one hand, it is necessary to explore the role that the lead firms can play. And on the other hand, reach them through intermediate agents. As a distinctive trait of this period it is worth pointing out that for small firms to be involved, as well as cluster associations, local development agencies have been turned to (as diffusing agents of the steering groups' activities) as has the network of vocational training centres coordinated by Tknika (in fields of training, entrepreneurship and support for non-R&D technological innovation). The Tkgune programme is particularly noteworthy in this regard, as it focuses on non-R&D technological innovation, to be developed by SMEs, which is supported by the Innovation Fund managed by the Presidency Department. During 2017-18 it allowed contact to be made between vocational training centres and 1,600 SMEs, to carry out over 400 innovation projects and make improvements in them.

Integration of Social Challenges

The **integration of social challenges** (and civil society) remains a key challenge across the RIS3. Agenda 2030 may provide an important opportunity to re-think how to integrate societal challenges into the RIS3. This seems likely to only become more important in the future, with discourse in Europe increasing the intensity of focus on sustainability transitions. Indeed, in Europe there are several approaches that are currently shaping innovation policies. The most relevant ones are the 'Transformative Innovation Policy' approach promoted by Schot and Steinmuller (2018), which aims to promote transformative change in socio-technical systems for addressing grand societal challenges and Sustainable Development Goals, and the mission-oriented innovation policy approach promoted by Mazzucato (2018), which informs the next European Research and Innovation Framework Programme.

These approaches, different in how they conceptualise the definition and implementation of innovation policy, give room to regions for contributing to these challenges and missions. Regions could be local spaces of experimentation for innovations to arise and/or regional actors can be part of multi-scalar R&I projects. In this sense, a reflection around how actual capabilities could contribute to these existing challenges and missions would move the RIS3 forward.

However, these approaches remain partial, in the sense that global challenges could be interpreted regionally but there are also regional societal challenges that could shape RIS3. That would mean not only looking at the contribution of existing priorities and areas of specialization to social challenges but on the other way around, defining which are the most important social challenges in the region and which are the capabilities to address them. This dual conceptualization of societal challenges has driven RIS3 strategies in other European regions, such as North Holland, where RIS3 is configured around four societal challenges³.

This means that RIS3 should have a balance between economic, social and environment objectives (Dosso et al., 2019). Therefore, the concept of innovation should go beyond technological innovation towards socio-technical innovation and integrate civil society at the core of the strategy, which is one of the key remaining challenges alongside European regions.

Implementation and Policy Mix

Several mentioned challenges and next steps forward will require larger and more integrated projects, with potential for greater cross-fertilization: in particular, the **implementation and policy mix** will need to adapt to facilitate this by

³ See <https://www.snn.nl/europa/strategie-voor-het-noorden> for more detail

experimenting with new instruments and finance modes, including public-private ones. Particularly needed is to move beyond traditional subsidies and supply-side instruments to new funding mechanisms that facilitate multiannual and demonstration projects.

Among these mechanisms it is important to consider the implementation of demand side instruments, in order to foster the diffusion of innovations. Public procurement of innovation in its different forms and roles of the public sector could drive economic diversification and transformation (Uyarra, 2019). There could be situations in which the government role is to create a market instead of boosting innovation or to diffuse it and the practices of public procurement would accordingly differ. There are very few regions in Europe that have included in their RIS3 toolbox demand side instruments such as public procurement being Galicia an example of region that have linked these practices to health and sustainable land management (Uyarra, 2019).

In any case, policy-mixes should be defined and implemented following a multi-level governance approach, taking into account the competencies and capabilities of each of the territorial levels from the local to the European level. As mentioned in section 5 of this report, there have been advances in the multi-level capillarity of the Basque strategy in the last two years, but there is still room for improving strategy integration and coordination for implementation.

Finally, it is worth mentioning that despite the advances in monitoring and evaluation of Basque RIS3, it is necessary to advance towards a diagnostic monitoring as defined by Sabel, as it would provide strategic intelligence to regional policy-mixes and strategy implementation.

Links to EU-level Dynamics

Finally, it is very clear that Basque Country as a whole, and in each of the strategic priorities and opportunity niches, is strongly present and well-positioned within the EU. Yet while notably in some of the opportunity niches that presence in key projects is providing a catalyst for the development of the EDP at home, there is a more general perception that the benefits from being well-positioned in EU initiatives are not very tangible (for example, the Vanguard Initiative). This is perhaps a surprising finding, and points to challenges to overcome with regards regions' engagement in EU-level initiatives.

Firstly, there is the issue of to what extent regions can make their voices heard within EU dynamics, when most key decision-making mechanisms are centered on the Member States. This could be tackled both by more effective coordination between the Basque Country and Spanish governments, and/or by reforms within EU institutions that give a voice to regions in decision-making around innovation and economic development that is in line with the weight placed at regional level on the development of smart specialization strategies.

Secondly, and in line with one of the key issues identified in Chapter 2 of this report, there is the issue of coordination across regional initiatives. As mentioned, promoting innovation through cross-border value chains has been the least successful aspect of the RIS3 exercise. The Vanguard Initiative, for example, has struggled to overcome the barriers to cross-border collaboration, and there is a need for more effective political coordination, knowledge coordination and financial coordination. The political coordination issues may be more easily solved at bi-lateral level, for example through the type of Memorandum of Understanding that has recently been signed between the Basque and Welsh governments, which also opens the way for tackling knowledge coordination across Basque and Welsh universities. More generally, the establishment of initiatives such as the Thematic Smart Specialisation Platforms or the European Strategic Cluster Partnerships should help facilitate stronger political and knowledge coordination. What is missing, however, is effective financial instruments backing this up to facilitate inter-regional investments in research and innovation. This is indeed linked with another of the key issues identified in Chapter 2, specifically the need to do far more to promote synergies and complementarities between EU funds for research and innovation.

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Annex 1: Interview Guide

Opening Statement

We would like to explore what has happened over the last two years (in 2017 and 2018) in terms of the evolution of the Basque RIS3, in particular with regards the evolution of the entrepreneurial discovery process.

1. **MAIN CHANGES: What are the most significant changes (in your thematic area) during this time?**
 - Changes in organization / structure?
 - Changes in actors involved? And how they are involved?
 - Changes in the focus of the strategy (or specific priority)?
 - Why have these changes happened?

2. **SPECIFIC ACTORS: What roles are different actors playing in the RIS3 process (and specifically in your thematic area)?**
 - Specifically, SMEs and entrepreneurs?
 - What type of involvement to they have?
 - What is their role in the governance process?
 - How has the role of research institutions / universities evolved?

3. **SPECIFIC ACTIVITIES: What are the current criteria to consider whether something fits within a specific thematic area or not (in your thematic area)?**
 - Have these criteria changed over the last two years?
 - To what extent have lead projects emerged in the area? Who is driving them? Have leaderships changed?
 - Have there been changes in activities in terms of closeness to market and the commercialisation of knowledge?
 - Have there been changes in activities in terms of the integration of social innovation or non-technological innovation?
 - Are there links with EU-wide initiatives and platforms? How have these evolved?

4. **EVALUATION: How are you evaluating the impact of your activities?**
 - a. What would you say are the main achievements in the last two years?
 - b. And the main pending challenges?

Annex 2: General Vision

This annex includes a table summarizing the key changes in the period 2016-2019 in the Basque Country RIS3 as a whole.

Changes in Organisation/Structure

- BCSTI: has allowed actors to develop conscience, alignment and sense of ownership of the strategy. Initially it was a space to explain the main steps of RIS3; now it is also a space of reflection on specific key subjects.
- SAC: has been renewed with younger, more diverse and technology-oriented members. Now is focusing on megatrends & 7 transversal areas. Some of its proposals have already been applied. Need for more connection with other spaces (transparency).
- Interdepartmental Committee: to synthesize and inform peers. Transversal funding (Innovation Fund) for some pilot and inter-SG projects.
- Interinstitutional Committee: to inform and legitimize. A top down approach.
- Multi-level Governance: The singularities of the provinces are taken into account when launching initiatives and also there is a growing awareness of the need to carry information and programs to the local level. But mainly from a top-down perspective.
- The role of Provincial Councils and cities in the RIS3 is small. The fields where MLG is more advanced is Cultural and Creative Industries and Bio-Health.
- SG: they are self-organized, according to Triple-Helix principles. Formal mechanisms have been less visible, but informal mechanisms have flourished.
- EDP: a space of learning by doing. There were already other EDP spaces (e.g. cluster associations), but new ones were created through SGs

Involvement of firms, SMEs & entrepreneurs

- More corporations in the SGs of AM and Energy; not in BioHealth
- Diffusion sessions of the SGs (arranged by Innobasque) for SMEs
- Provision of technological services for SMEs by VET centers
- Courses and programs on non-technological innovation for SMEs
- Access SMEs by means of intermediary agents (LDAs) and leading companies
- BIND program to connect Industry 4.0 related start-ups and leading companies
- Goals about start-ups in contract programs with universities, CRCs and RTOs
- Despite all this, entrepreneurship/entrepreneurs continue without been integrated into RIS3

Involvement of universities & research institutes

- The presence of the rectors of the universities in the BCSTI has been quite active and has allowed them to develop a sense of ownership
- Universities are not in the SGs, but are in working groups. In response, universities have tried to organize themselves (under the leadership of the Education Department) and develop their own initiatives for the development of the RIS3 (e.g. Cluster 4gune)
- RIS3 has been integrated into the Basque University Plan and in the calls of the programmes
- Coordination among universities and between them and other agents has increased thanks to Education Department, Cluster 4gune & Euskampus
- The University + Enterprise strategy has made considerable steps (inventories on teaching and research resources related to priorities, new dual programs...), especially in AM.
- VET system is moving ahead very well, led by Tknika and increasingly coordinated with the university
- The RTOs are quite aligned and main protagonists in Collaborative Tractor Projects (CTPs) and European initiatives. They are also present in the SGs of the three strategic priorities.
- CRCs: they are becoming more aligned with the RIS3

Involvement of other significant actors

- Intermediary agents (LDAs, Chambers of Commerce...) have been trained and connected to reach SMEs
- Cluster associations are not present in this period in the SG of AM and they participate on demand. Nevertheless, they have fostered some CTPs and some of them have been accredited in the BNSTI. They have continued to play active roles in the opportunity niches, and a leading role in the Energy strategic priority.
- There have been some urban representatives in the SG of Urban Habitat
- Innobasque has transmitted information from SGs towards intermediary agents and has trained them

Changes in focus of strategy

- No real change in overall focus of strategy; some focusing in specific priorities.
- Alive plan: new additional objectives are established each 2 years by the BCSTI

Characteristics of strategic projects (actors, leaderships, definition, closeness to market, etc.)

- Innovation Fund: has been applied for the development of operational objectives set up by the BCSTI. Mainly strategic initiatives and CTPs. Main handicap: the small amount of each project and annual nature of funding
- CTPs: between SGs, above 4 million €, for initial stage of the projects (to be continued by existing programs)
- Strategic initiatives for each SG: Pilot projects have allowed exploring and experimentation, but for small scale initiatives
- There has been some progress in the alignment of policy programs, but in turn the number of sectoral programs have increased
- Public programs have started selecting projects according to RIS3 priorities
- Universities are trying to set up knowledge poles
- The Innovation Fund, the CTOs, the strategic initiatives, the EDP... are not brand new ideas in the Basque Country

Integration of social & non-technological innovation

- Courses and programs on non-technological innovation have been launched (Hazinnova)
- A program to provide SMEs with technological services not based on R&D, delivered by VET centers, has been launched
- The Innovation Fund supports the ideation of social innovation projects, but then there is no Basque program to fund their continuity or administrative muscle to canalize them to European projects

Links to EU-wide initiatives

- Very good positioning of the BC: Vanguard, Industrial modernization, Energy, partenariat of healthy ageing, KIC food...
- But coordination among them must be increased and the BC must be present in European decision processes by means of Central Government.
- Some people are doubtful about whether these links are due to RIS3

Evaluation & Impacts (Is it taking place? Are impacts detected?)

- There have been internal processes to evaluate the strategy annually (by means of indicators), policy tools every two years, and research centers with basic funding every year.
- External assessment has been conducted by Orkestra (with the collaboration of K. Morgan) every two years. The concrete messages arisen from these assessments have led to significant decisions.
- Enough evidences or quantitative data have not been collected to review existing priorities
- There have been attempts to diffuse information (Web RIS3 Euskadi...), but some people still think that information does not flow and there is a lack of transparency
- Presentations in the Interdepartmental Committee are considered a way to be accountable with peers

Main achievements

- Generation of common language and alignment. Sense of ownership and being part of a collective project
- Decisions based on evidence
- Creation of organizational infrastructures: SGs and WGs
- Some alignment of programs
- Diffusion of the innovation culture to non-economic Departments
- Awareness raising about the need of activating demand, take care of SMEs, relevance of non-technological innovation, STEAM...

Pending Challenges

- Quantitative analysis to review priorities
- Policy mix (new instruments) and align more programs
- EU: should give real prominence to regions and set up new instruments and funding
- The private sector is not advancing enough in R&D, PhD personal
- More connections, interaction and coordination between different areas, spaces, cultures and agents
- Give more space to the youth and to the diversity of personal profiles
- Societal challenges must be incorporated more systematically
- The Interdepartmental Committee should foster the sharing of challenges and learnings
- The Interinstitutional Committee should incorporate also a bottom-up perspective
- There is a lack of investment in large, strategic, long-term projects

Annex 3: Strategic Priority Areas

This annex includes tables summarizing the key changes in the period 2016-2019 in each of the 3 strategic priority areas.

Advanced Manufacturing

Changes in Organisation/Structure	<ul style="list-style-type: none"> • New Executive Commission comprised of administration, technology centres & individuals from private sector • Switch from working groups to three 'pillars' of activity <ul style="list-style-type: none"> ○ Basque Digital Innovation Hub ○ Training for Employment ○ New Business Models • Other working dynamics maintained: Inter-cluster forum & internationalisation group
Involvement of SMEs & entrepreneurs	<ul style="list-style-type: none"> • All three pillars in principle oriented to needs of small firms, rather than large firms • Direct involvement through Basque Digital Innovation Hub • But advancing very slowly in terms of involvement
Involvement of universities & research institutes	<ul style="list-style-type: none"> • Universities (or education department) not directly present in executive board, but represented through ClusterGune • Reduction in number of technology centres represented on SG (now Vicomtech & Tecnalia), but all are involved in BDIH
Involvement of other significant actors	<ul style="list-style-type: none"> • Disappearance of other levels of administration from SG • Substitution of cluster associations in SG for individuals associated with large firms • Cluster forum, but not activated – cluster associations engage on demand
Changes in Focus of Strategy	<ul style="list-style-type: none"> • Shift from 5 working groups to 3 pillars, but focus of strategy stable • Move towards more horizontal approach (supporting SMEs)
Characteristics of strategic projects	<ul style="list-style-type: none"> • Strengthening of focus on projects with high TRLs (e.g. through BDIH) • Bind 4.0 a complementary activity
Integration of social & non-technological innovation	<ul style="list-style-type: none"> • New Business Model Pillar will augment focus on non-technological innovation
Links to EU-wide initiatives	<ul style="list-style-type: none"> • Digital Innovation Hub provides a key link – Interreg project, certification, relationships with other DIHs • Well-recognised in Europe
Evaluation & Impacts	<ul style="list-style-type: none"> • BDIH has a monitoring framework and also planned for other pillars • Evaluation of impact of priorities related to HAZITEK programme • Lack of resources for more thorough / widespread evaluation
Main achievements	<ul style="list-style-type: none"> • Consolidating a systemic dialogue between public and private sectors • Prioritisation of key (horizontal) activities strengthening how SMEs approach Industry 4.0 • Launch of the Basque Digital Innovation Hub: 6 nodes now active • Clustergune and its role in bringing together all actors related to training needs
Pending Challenges	<ul style="list-style-type: none"> • Develop critical mass of actions in each of the pillars • Increase engagement of SMEs • Work towards culture of long-term innovation, backed by long-term finance and sophisticated demand • Develop new pillars in key areas: circular economy, artificial intelligence

Energy

Changes Organisation/Structure	in	<ul style="list-style-type: none"> ● Inclusion of 4 lead companies in the Steering Group, generating a second wave of business involvement
Involvement of SMEs & entrepreneurs		<ul style="list-style-type: none"> ● SME integration into dynamics with lead companies ● Specifically, involvement of ICT companies in the WGs
Involvement of universities & research institutes		<ul style="list-style-type: none"> ● Involvement of universities as a main change (UPV came, Deustotech was invited, Mondragon). ● Technology centres are very active in all the working groups and their involvement has been increased in this time
Involvement of other significant actors		<ul style="list-style-type: none"> ● Importance of the cluster association in facilitating the evolution of the priority
Changes in Focus of Strategy		<ul style="list-style-type: none"> ● Not a big change but now in review process ● Focus won't be changed but will be reorganized around three macro-chains: <ul style="list-style-type: none"> ○ Offshore energy ○ Smart grids ○ Resource efficient manufacturing
Characteristics of strategic projects (actors, leaderships, definition, closeness to market, etc.)		<ul style="list-style-type: none"> ● 3 types of projects: ● R&D: submitted to R&D programmes ● Strategic projects: bigger and more ambitious (demonstration projects). <ul style="list-style-type: none"> ○ Defined in working groups (6 implemented out of 11 selected) ○ Led and co-funded by big companies ● Horizontal activities (non-technological)
Integration of social & non-technological innovation		<ul style="list-style-type: none"> ● Included in the horizontal activities led by the cluster ● Challenges identified are talent and training, new markets and business model innovation
Links to EU-wide initiatives		<ul style="list-style-type: none"> ● Presence in many EU networks and projects but returns are not very clear (long term strategy)
Evaluation & Impacts (Is it taking place? Are impacts detected?)		<ul style="list-style-type: none"> ● Conducting a review process in 2019
Main achievements		<ul style="list-style-type: none"> ● Involvement of companies ● Keeping the process fresh (new entrants)
Pending Challenges		<ul style="list-style-type: none"> ● More involvement of the companies in the steering group and more 'country' projects (a more strategic selection of the projects) and integration of producers to generate critical mass. ● Innovation in the policy-mix (i.e. financing for demo projects) ● Links with other priorities could be deepened ● Moving from technology to industrial and social issues. ● Challenges around energy transition

Bio-Health

Changes in Organisation / Structure	<ul style="list-style-type: none"> • Government departments have met periodically instead of the steering board • Changes in the Technical Secretary (within Bioef) • Changes in working groups <ul style="list-style-type: none"> ◦ Big data changed to personalized medicine ◦ New groups: neuro and new business models ◦ Subgroups emerged in large WGs ◦ Change in coordinator of personalized medicine
Involvement of SMEs & entrepreneurs	<ul style="list-style-type: none"> • Priority composed of small start-ups, but these are only present in working groups and without leading role • BIND 4.0 programme (aiming to promote relations between start-ups and leading companies) not properly fitted to the health field
Involvement of universities & research institutes	<ul style="list-style-type: none"> • UPV-EHU & MU have entered the steering group (but without any active role) • Other universities remain absent
Involvement of other significant actors	<ul style="list-style-type: none"> • Provincial councils entered the SG • The main consumers are doctors. They are difficult to integrate into the SG, due to their different culture and corporatism.
Changes in Focus of Strategy	<ul style="list-style-type: none"> • The WG of rare diseases loses relevance and medical devices becomes more important
Characteristics of strategic projects (actors, leaderships, definition, closeness to market, etc.)	<ul style="list-style-type: none"> • Public procurement and Baliosasun have had no impact. • Innosasun has been helpful for firms to access health institutions, but little impact due to the lack of information and funding. • Funding provided by the Innovation Fund is small and of an annual nature. It has been a catalyzer, but its reach is limited. • Most of the companies belong to Medical devices. This is the prevalent WG and the closest to the market. • The cluster association is gaining in strength, especially for the new firms that entered the association. • Initially Biohealth was one of the most cited priorities for inter SG joint projects. But expectations have not been met.
Integration of social & non-technological innovation	<ul style="list-style-type: none"> • The real problem is not the business model, but the market.
Links to EU-wide initiatives	<ul style="list-style-type: none"> • High participation in European networks and partenariats (especially in healthy ageing). The participants are the RTOs, Euskampus, the Health Department... but seldom companies.
Evaluation & Impacts (Is it taking place? Are impacts detected?)	<ul style="list-style-type: none"> • There are not significant strategic initiatives. But interesting business developments (Iline, Kiro, Oncomatrix, Histocell, FAES Farma, Egile...) • There have not been formal evaluation exercises. But informal assessments have been carried out and, based on them, decisions have been taken in meaningful issues.
Main achievements	<ul style="list-style-type: none"> • RIS3 has allowed to increase the knowledge and collaboration between agents and organisations (health professionals, firms, researchers...), up to then far apart from each other. • Some business projects have appeared and the cluster association has strengthened.
Pending Challenges	<ul style="list-style-type: none"> • No presence of firms in the SG, or very small presence in some WG. • DEDI's leadership (or co-leadership) • The economic development mission has not been fully internalized by the Health Department/Osakidetza • The institutional architecture not coherent and responsive to a business or economic logic • Not clear role distinction between some WG (or even the SG) and the Biohealth Cluster association • Lack of basal and multi-year funding • More interaction is needed in the SG, as well as overcoming the divide between the different worlds present in the SG • A Clustergune adapted to this priority should be promoted

Annex 4: Opportunity Niches

This annex includes tables summarizing the key changes in the period 2016-2019 in each of the 4 opportunity niches.

Food

Changes in Organisation / Structure	<ul style="list-style-type: none"> • Change from 6 main areas to three: Food and health, ICTs and New production systems • Each one defines its governance. • Vice Minister and Director of AZTI make connection between SG & IDC
Involvement of SMEs & entrepreneurs	<ul style="list-style-type: none"> • The PG prioritization was made according the interest and challenges of firms. • More participation of firms and SMEs • Communication of the strategy to SMEs by Innobasque
Involvement of universities & research institutes	<ul style="list-style-type: none"> • BCC, Neiker and Basque Public University: their sorle don't change. Mainly dynamizing collaboration and generating innovation culture. • But there is a change in their focus: from the development of their capabilities towards more demand oriented, specially on technological centres.
Involvement of other significant actors	<ul style="list-style-type: none"> •
Changes in Focus of Strategy	<ul style="list-style-type: none"> • Focus of strategy now is much more specific than at beginning: 3 areas
Characteristics of strategic projects (actors, leaderships, definition, closeness to market, etc.)	<ul style="list-style-type: none"> • The projects are more near to the market
Integration of social & non-technological innovation	<ul style="list-style-type: none"> • Special focus on non-technological innovation (marketing, product design..), because the communication with the final consumer is critical. There is a revolution on the relevance of knowing the consumer and his(her behavior and adapting the products to it.
Links to EU-wide initiatives	<ul style="list-style-type: none"> • IP Food: Bidirectional. Promotion of open innovation.
Evaluation & Impacts (Is it taking place? Are impacts detected?)	<ul style="list-style-type: none"> • 5 indicator in this opportunity niche.
Main achievements	<ul style="list-style-type: none"> • The creation of subgroups to adapt to firm needs. • Closer to the market
Pending Challenges	<ul style="list-style-type: none"> • To add new firms • From price war towards more innovation

Ecosystems

Changes in Organisation / Structure	<ul style="list-style-type: none"> • Changes seeking to widen and deepen participation • MCC and Energy Cluster join steering group • Changes in some representatives • Emergence of working groups (WGs) in specific areas: <ul style="list-style-type: none"> • Circular economy • Ecosystems
Involvement of SMEs & entrepreneurs	<ul style="list-style-type: none"> • Clusters involved in SG, but no direct involvement from SMEs • SMEs involved through participation in projects and instruments promoted by IHOBE (innovation fund) • Other forums with clusters and large firms (e.g. Basque Eco-design Centre)
Involvement of universities & research institutes	<ul style="list-style-type: none"> • IK4 and Tecnalia have had strong involvement, but interests don't always coincide with those of firms • Change in who participates from IK4 (not yet from Tecnalia) • MU and Centre for Environmental Studies joined
Involvement of other significant actors	<ul style="list-style-type: none"> • MCC and Energy Cluster have joined, but link between clusters & firms hasn't worked well so far • New involvement of 'non-environmental people' to strengthen links to other SGs
Changes in Focus of Strategy	<ul style="list-style-type: none"> • Split focus between circular economy and ecosystems • Re-focusing strategy following feedback from steering group members (2018 questionnaire) • Possibility of other WGs emerging in knowledge transfer and eco-innovation
Characteristics of strategic projects	<ul style="list-style-type: none"> • Modest projects supported by Innovation Fund as catalysts for larger projects funded by SPRI &/or H2020 • Range of types of projects: <ul style="list-style-type: none"> • Demonstration projects (TRLs 8 & 9) • Eco-innovation projects (TRLs 5 & 6) • Design excellence projects support EU proposals
Integration of social & non-technological innovation	<ul style="list-style-type: none"> • IHOBE work with firms in non-technological innovation, • Basque Eco-Innovation Hub plays a key role
Links to EU-wide initiatives	<ul style="list-style-type: none"> • IHOBE active in several EU forums • Firms need to take advantage more of EU projects
Evaluation & Impacts	<ul style="list-style-type: none"> • Project evaluation the main mechanism • Recent questionnaire to SG members
Main achievements	<ul style="list-style-type: none"> • Positioning the circular economy as a core area for innovation • Helping IHOBE to focus and prioritize their activities • Consolidation of financing of innovation fund for projects
Pending Challenges	<ul style="list-style-type: none"> • Scale up level of investment in R&D • Stronger links to / or integration with other SGs • Greater understanding in firms and government of the transversal nature of circular economy

Urban Habitat

Changes in Organisation / Structure	<ul style="list-style-type: none"> • Change of leadership: territorial planning with support of housing • Got rid of working groups (from 5 to 2) and work now focused on pilot projects
Involvement of SMEs & entrepreneurs	<ul style="list-style-type: none"> • From producers to involvement of consulting firms, and social enterprises • More active in previous phase (materials producers)
Involvement of universities & research institutes	<ul style="list-style-type: none"> • Universities involvement in some projects • Technology Centres less active in this phase (because now is closer to market and less research oriented)
Involvement of other significant actors	<ul style="list-style-type: none"> • Greater involvement of cluster associations and new actors • Little involvement of social agents
Changes in Focus of Strategy	<ul style="list-style-type: none"> • Shift from building to integral urban generation
Characteristics of strategic projects (actors, leaderships, definition, closeness to market, etc.)	<ul style="list-style-type: none"> • Projects supported and selected by BG around two strategic lines led by cluster associations or other agents. • Projects are very close to the market (high TRLs, demonstration projects)
Integration of social & non-technological innovation	<ul style="list-style-type: none"> • Through social agents
Links to EU-wide initiatives	<ul style="list-style-type: none"> • There are European projects but not very linked with the strategy
Evaluation & Impacts (Is it taking place? Are impacts detected?)	<ul style="list-style-type: none"> • No evaluation
Main achievements	<ul style="list-style-type: none"> • More holistic view • Incorporation of innovation to the sectoral agenda • Cooperation with other SG
Pending Challenges	<ul style="list-style-type: none"> • Reorganise the SG- too many people and not very manageable • Increase the funding for projects and better align the proposals to the strategic lines • More balance between research and demonstration projects • Incorporate digitalization and concentrate in less and bigger projects (country bet)

Creative and Cultural Industries

Main changes since 2016 in Organisation / Structure	<ul style="list-style-type: none"> • Involvement of DEDI department alongside culture department
Involvement of SMEs & entrepreneurs	<ul style="list-style-type: none"> • SMEs involvement is articulated through the support programmes and through the technology centers. The SG is composed of 50 people (not manageable that SMEs are involved). Plans to divide it in working groups and then they will be involved
Involvement of universities & research institutes	<ul style="list-style-type: none"> • Universities are not involved • Technology centres have been incorporated to facilitate the technology innovation axis of the support programme (they receive the funding)
Involvement of other significant actors	<ul style="list-style-type: none"> • Clusters are involved but with not a strong role
Changes in Focus of Strategy	<ul style="list-style-type: none"> • Boost of Innovation as a key element of the sector and integration of creative and cultural industries.
Characteristics of strategic projects (actors, leaderships, definition, closeness to market, etc.)	<ul style="list-style-type: none"> • The main projects have been led by the BG (Culture department mainly): • Policy-mix mapping • Working with EUSTAT in integrally defining the sector • Creadis3 (Interreg project) • KSI Berritzaile-support programme • Launch of Basque CC District to create critical mass
Integration of social & non-technological innovation	<ul style="list-style-type: none"> • In the support programme (innovation in the business model and in the financing model)
Links to EU-wide initiatives	<ul style="list-style-type: none"> • Interreg project and RIC network very positive
Evaluation & Impacts (Is it taking place? Are impacts detected?)	<ul style="list-style-type: none"> • They are working with EUSTAT for having data
Main achievements	<ul style="list-style-type: none"> • Inclusion of DEDI in the leading of the group
Pending Challenges	<ul style="list-style-type: none"> • SG very big (is only for legitimizing) • Better integration of cultural and economic development views • Need of cross-fertilization among priorities/niches • Incorporation of support programmes for internationalization and intellectual property • Prioritize among sectors • Bigger involvement of Provincial and City Councils



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