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**Reimagining the Basque Country Area of Innovation through Tradition, Talent
and Technology**

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Reimagining the Basque Country Area of Innovation through Talent, Technology and Innovation
EXECUTIVE SUMMARY

The Basque Country Technology Parks, since their pioneer creation in Spain in 1985, have led the regional development in the Basque Country, which has known how to preserve its roots and industrial tradition by converting them into a differential value, adapting the value proposition, strengthening the joint work of the different institutions and focusing on those sectors with a high growth potential, as is the case of Industry 4.0., while combining talent, science, technology and innovation and including the city as a point of reference and convergence.

The aim of this paper is to present and focus on the main changes experienced and proposed for the forthcoming years in the Basque Country, to evolve towards the development of the Area of Innovation. These changes are related, among others, to the new business model, the new sectors of activity and the way in which society and tenants take part through the different campuses by means of cooperation, creating a shared identity and values among members.

1. INTRODUCTION

For the past 50 years, the landscape of innovation has been dominated by places like Silicon Valley, suburban corridors of spatially isolated corporate campuses, accessible only by car, with little emphasis on the quality of life or on integrating work, housing and recreation. A new complementary urban model is now emerging, giving rise to “innovation districts”, geographic areas where leading-edge anchor institutions and companies cluster and connect with start-ups, business incubators, and accelerators. They are also physically compact, transit-accessible, and technically-wired and offer mixed-use housing, office and retail¹.

The IASP calls these spaces “innovation areas” considering them places designed and created to attract entrepreneurial-minded people, skilled talent, knowledge-intensive businesses and investment². Science and Technology Parks would be among the various types of areas of innovation created in the world.

This trend towards the development of areas of innovation and innovation districts is also reflected in the natural evolution of the Technology parks in the Basque Country, since their pioneer creation in Spain in 1985. In recent years, the Parks have been evolving towards a new multi-campus layout attracting new kinds of tenants, actors and sectors to the existing campuses and strengthening the position of the Parks as the main science, technology and talent gatherer in their region.

Given this, the next challenge for the Basque Country is to evolve in the upcoming years towards an Area of innovation and become more diverse, inclusive and accessible, and consequently, more competitive, innovative and cross-cutting.

However, to move from the Science and Technology Park concept to the concept of an Area of innovation, the changes experienced in recent years and those still to come are numerous, and would need the joint action and strategy of the main stakeholders of the Park, including local and regional governments and university; and also, the city as one of the future key players together with society and the talented professionals of the Park that give sense to this new concept and joint challenges.

2 SETTING-UP AND EVOLUTION OF THE TECHNOLOGY PARK AS THE LEADING FORCE FOR REGIONAL DEVELOPMENT IN THE BASQUE COUNTRY.

Science and technology parks play a key role in the economic development of their environment through a dynamic and innovative mix of policies, programmes, quality space and facilities and high value-added services³.

This is the case of the Basque Country, which has placed itself among the most innovative regions in Europe thanks to the standing and steady strategy for growth during the last decades and due to the development of the Basque Country Technology Parks network.

This network consists in three initiatives with a total of six multi-disciplinary campuses strategically distributed in the three territories that make up the Basque Autonomous Community, and where from a coordinated management, business, research centres, technological centres and innovator promoter stakeholders are located.

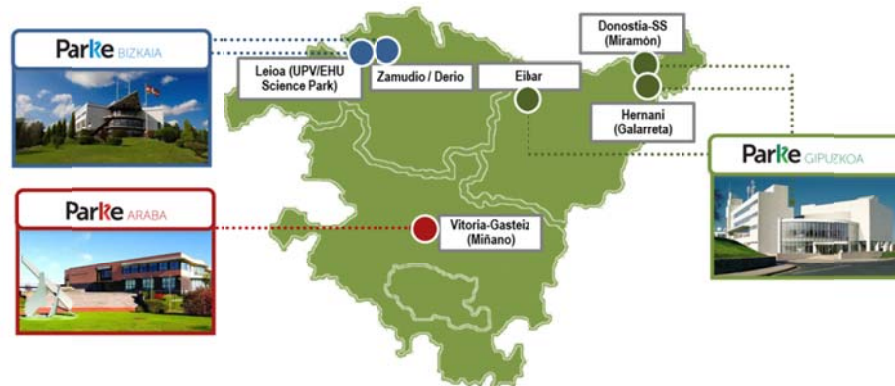


Figure 1: Own Source

Basque Country Science and Technology Parks Network

They come together in just one region, the Basque Country, with a high degree of development, 129%, above the European level; a high weight of industry, of 23.6% of the GDP; and a priority and continued well developed cluster policy, developed since 1991 in collaboration with the well-known Professor Michael Porter, with 11 strategic clusters in key areas.

The activities connected to the Basque Technology Parks contribute to the improvement of the economy of the Basque Country, producing 5,5% of the GDP and 5,4% of employment⁴. In fact, the Basque Technology Parks unite 30% of the employment engaged in R&D&I in the Basque Country, and are a reference point in their environment. Over 120 agents are working in an integrated and coordinated fashion, most of them located in the Technology Parks.

As one of the most industrialised regions in Europe, the changes experienced by the Basque Country in the last 30 years have been amazing and are mainly due to the efforts of the Basque institutions to **foster talent development, the diversification of the economy and the creation of cutting-edge enterprises working in research, development and innovation.**

Having reached maturity and become firmly established, the Basque Parks have become an essential element in the science, technology and innovation system of the Basque Country.

The development and flourishing of the Technology Parks in the Basque Country is the result of the different phases and challenges achieved, explained throughout the document, that will lead the transition towards an Area of Innovation in the upcoming years.

2.1. First Stage. The creation of Bizkaia Technology Park: The Pioneer

Created in 1985, Bizkaia Science and Technology Park was the first Technology Park in Spain. Its origins are closely linked to the economic situation of the 80s that pushed the government towards rethinking the basis of its economic development and to focus on regional development through high value-added activities and major investment in research, development and innovation.

This milestone gave birth to the first Technology Park in the Basque Country, with a mission to decisively contribute to technological development and innovation in Bizkaia in a sustainable way, encouraging the exchange of knowledge and transfer of technology between businesses, technology agents and universities, promoting the creation and growth of innovating businesses and offering top quality installations and value-added services.

This Park can be considered a greenfield model, strategically located in a privileged environment just 10 km away from the city of Bilbao, and with excellent connections by sea, air and land. In fact, its strategical position has turned out to be key for its success.

In the 90's, several crucial obstacles to economic growth were identified. These included limited skills in critical areas concerning strategy or international knowledge, and little emphasis on research and development by both companies and government⁵.

The Basque Government was clear that Industry had to play a key role for an economic recovery and the wealth of the region. As there was no specific sector to "anchor" the newly-created Park, it was defined as a cross-sectorial Park, gathering together the main cutting-edge business existing in Bizkaia and the Basque Country in emerging new sectors such as aeronautics, engineering, and Information and Communication Technologies (ICTs).

Initially, maximum effort focussed on the construction of the buildings and on attracting and creating highly competitive and technological businesses, boosting sectors which at the time were almost non-existent in the Basque Country. This was the case of the aeronautical industry in the 80s or the biotechnology sector in the first decade of the new millennium, or in the last decade, the industry 4.0. or advanced manufacturing which has seen an unbelievable increase. This is discussed in later chapters.

By 1997, three Technology Parks were created in the Basque Country, giving birth to the first Technology Parks network, a pioneer network in Spain, to coordinate its development better and exploit synergies between the Parks. At that time, the innovation aspect is also fostered, with the creation of the Basque Science, Technology and Innovation Network and the participation in it of the Basque Parks.

2.2. Second Stage. The Scientific Park: leveraging university talent and driving entrepreneurship

After the successful consolidation of the first Campus of the Technology Park, in the early 2000s, the Park and its main stakeholders moved a step forward and laid the foundation for the creation of a meeting point between university, science and business, thereby giving rise to the first Scientific Campus at the Park. The Scientific Campus, follows the greenfield model of the former Park and is once again located 10 km from the main City of Bilbao, on the main Campus of the University of the Basque Country.

Opened in the summer of 2016, its launch marked a change in the management model and it has successfully achieved the inclusion of the University of the Basque Country as a shareholder of the Park, the ownership until then being mainly dominated by the regional and provincial governments.

The Park aims to foster relations between university and business, to create new spin-off companies with a technological base and highly qualified employment, and to encourage the inclusion of highly qualified research personnel in the firms. The links with the university make the park unique in the Basque Country, promoting innovation, transfer and entrepreneurship, and establishing close ties between university research and the social and economic network.

2.3. Main challenges achieved in the Basque Country

After three decades of existence the Basque Network, is now a **thriving and prosperous innovation ecosystem**, gathering together 429 research centres, technology centres, innovation developers and a good selection of the most advanced and cutting edge organisations in the Basque Country from innovative sectors with potential for development. With a staff of nearly 16,000 highly qualified and talented people, it is a reference point for researchers in the most prominent industrial sectors, providing an excellent location in quality sustainable environments.

Thus, the Park acts at the vanguard of innovation and technology, to continue as a benchmark in the future, contributing to increasing the competitive edge of businesses and providing society with added value.

Nevertheless, in order to advance towards the creation of the Basque Country area of innovation, it is necessary to boost the connection among the different ecosystems of innovation developed through the territory, including the city and society as a fundamental asset of the Park.

3. STEPPING INTO THE FUTURE: REIMAGINING THE BASQUE COUNTRY AREA OF INNOVATION

3.1. CITIES AND REGIONS AS POLES OF ATTRACTION AND CATALYSTS OF TALENT: THE CASE OF BILBAO

People are the driving force behind regional growth. Studies find a clear connection between the economic success of nations and their human capital, as measured by the level of education. That is why places with a higher number of talented people grow faster and are better able to attract more talent⁶.

Talent discourses at organizational level have been around for decades, and share a rich and layered history. As cities and regions come to the forefront in designing innovative talent strategies, they are well-advised to borrow and critically adapt from what has worked and what has been discarded in the way corporations and other organizations compete for talent⁷.

To become a reference, and to be able to mobilise talent to boost regional prosperity, in recent years, the city of Bilbao has advanced towards a position as a city of knowledge and technology, a city to live and work in.

The industrial restructuring has led to cultural, social and educational development, combined with the creation of new pioneer infrastructures designed by renowned architects such as Norman Foster, Santiago Calatrava, and the iconic Guggenheim Museum, the masterpiece symbol of the city, designed by Frank Gehry.

The main changes that the city has experienced have led to receiving two international awards, namely, the Smart City and the Education Cluster awards from the prestigious Financial Times Group, which contribute to its position⁸. The first award, Smart City, recognises the strategy for obtaining a perfectly-connected city through the use of new technologies, and the commitment to innovation, knowledge, excellence and internationalisation. The second, Education Cluster, highlights the city's commitment to promoting innovation and the exchange of knowledge between universities and training centres. These awards are, unquestionably, a seal of quality for the cities receiving them and contribute to placing the city of Bilbao on the international map.

This positioning is also reflected in the recently published study which explains how cities and regions compete globally for tomorrow's talent⁹, and in which the City of Bilbao excels above other European Regions in certain areas related to talent management.

The study shows how the City of Bilbao dramatically outperforms in the indicators related to Building Global Knowledge and Retaining Talent, placing it in the Top 3 out of 27 European cities. This is a remarkable achievement and will serve as a cornerstone for the city's continued efforts to market itself as a European and global talent destination. Moreover, a high ranking in the global knowledge area of talent competitiveness indicates that the city and the region are well-prepared and positioned to punch above their weight, and size, in forging and cultivating global knowledge networks, partnerships and links.

With these developments, the city has tackled the difficult challenge of transforming the industrial society into a leading and thriving city connected internationally. The transformation of the city has taken place not only in environmental terms but also in urban terms. It has included the recovery of the estuary which passes through the city of Bilbao, and is the soul of the city and silent witness to its history, and the backbone to communication and trade. In this strategic area is precisely where the future Urban Park will be placed.

3.2. **DESIGNING THE FUTURE URBAN PARK: BREAKING BOUNDARIES AND REIMAGINING THE CITY CONCEPT**

Planned for the forthcoming years, the creation of an Urban Park within the city of Bilbao, the nerve centre of the Basque Country and principal hub of innovation in the region, will represent a new milestone and foster progress towards the reinforcement of the Basque Country area of innovation.

Located on what was previously a highly-industrialised zone or brownfield, the design of this new campus will represent a paradigm shift in the Park management model considered until now, as it will lead to a change in:

- Model and type of park, going from the so-called Greenfield model of the previous two campuses to a Brownfield model.
- Operating model, moving to a new model based on verticality on urban land.
- New type of tenants and residents, going from a merely business and value-added services model to a more inclusive society-conscious model which combines areas for residential purposes, business and science and technology.
- Cooperation among different developers and potential access to new local stakeholders who support the new initiative, with the involvement of the city of Bilbao.

The design of a new urban park in the city of Bilbao will contribute to the recovery and inclusion of the city in the science, technology and innovation landscape. Human capital will remain a fundamental asset in the design of this new model of park, which is more competitive and forward-looking.



Figure 2: Design of the Future Urban Park in the city of Bilbao

Masterplan of the Zorrozaurre Area

This new challenge will enable one of the most important urban projects to be built on the banks of the estuary, as it has been successfully achieved in certain other vibrant cities across the globe. In fact, this privileged space may be compared to the districts created in other expanding urban zones facing restructuring around the world where degraded zones have given way to new spaces and the creation of a new cultural district with large public spaces for shared uses. Here science and technology mingle with activities for society as is the case of cities such as Barcelona or London in Europe, or Boston, New York or Montreal in North America.

It will also enable the city to compete at international level for talent, complementing the current role of the Technology Park. In short, the Urban Technology Park and the inclusion of the city of Bilbao will offer a new opportunity for promoting and launching the already established image of Bilbao at international level as a dual city, both cosmopolitan and pole of development based on knowledge, innovation, and the talent of its citizens.

In the end, business is not only about maximizing value and realizing profit, but just as importantly, about people coming together, engaging with each other and in the process, learning, making sense of things and creating as well as adapting to new social realities and patterns. The task now is to translate this achievement into communication strategies which will help cement what has been accomplished, and to generate the “virtuous cycle” in which success calls for more success, and talent brings more talent ¹⁰.

4. FUTURE TRENDS AND FUTURE CHALLENGES FOR THE BASQUE COUNTRY TECHNOLOGY PARKS: ADDING VALUE THROUGH THE SMART SPECIALISATION STRATEGIES

4.1. TRACKING INNOVATION: DIVERSIFICATION AS A KEY DRIVER FOR PROSPERITY

New global trends have drawn attention to the need to promote specialisation and diversification towards new technologically advanced sectors with a high potential for development.

The Basque Country has spent decades implementing an active policy of support for industry, based on powerful manufacturing clusters and developing the strategy for smart specialization. This strategy has been led by the Basque Government, with the support of leading institutions such as the Technology Parks.

Thanks to this effort, today, the Basque Country already has a track record in developing policies to support competitiveness, specialization and diversification that comply with the requirements of Smart Specialization Strategies (RIS3) ¹¹.

But what is a Smart Specialization Strategy and how has it been implemented and deployed in the Basque Country? The RIS3 strategy seeks to develop smart strategies, through specialisation and the concentration of resources and investment in areas where clear synergies already exist with the existing and potential production capacities of the region.

In the process of identifying vertical priorities, the basic document used was the Basque Science, Technology and Innovation Plan 2020¹², which establishes a deliberate and explicit strategy for diversifying the Basque economy, based on three essential enabling technologies, one of these being advanced manufacturing, and four priority markets.

Consequently, three priorities have been defined, which affect different sectors in which the Basque Country has strong specialization and skills, with a commitment to diversifying the business fabric towards levels of high technology and a potential high growth sector.

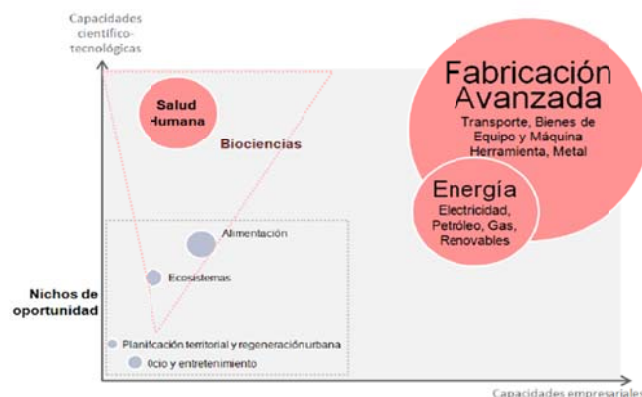


Figure 2: Vertical priorities of the Basque Country

BC Science, Technology and Innovation Plan, 2020

Advanced Manufacturing fulfils these requirements and has become one of the key areas. It affects several production sectors in the Basque Country, is key in the industrial tradition of the region and has significant technological capabilities linked to manufacturing. Progress in technologies such as nanotechnology, advanced manufacturing and ICT will be transferred to the most representative industrial sectors of the Basque economy: mainly metals, machine tools, transportation, environment and advanced services. The final goal is to increase their competitiveness and added value.

According to the Basque Science, Technology and Innovation Plan 2020, Smart specialisation will permit the Basque Country to continue advancing towards a knowledge-based economy. In fact, the RIS3 strategy is a dynamic process involving different stakeholders who form the “Quadruple Helix” of the innovation process: public authorities, business, academia and the civil society.

In this way, the strategy will enhance cooperation between the world of science and the world of business in order to direct R&D&I towards results with the objective of encouraging the concentration of resources and investment in R&D&I in areas where there are clear synergies with the existing and potential production capacities of each region.

Support for Industry 4.0. has allowed the economy to diversify, raising it to a higher technological level which will enable to increase the capacity and potential of the sector exponentially. The specialisation not only requires the reallocation of available resources but also, and above all, the launching of a process to generate new capacities and optimise existing resources, by substantially seeking to improve the returns on investment.

Therefore, a new approach is sought, aimed at increasing collaboration throughout the research and innovation chain, and enabling reductions in the time which elapses between the birth of an idea and its introduction to the market.

The Basque Country has adopted the new tendencies to place itself at the fore of new developments, considering diversification as a source of competitiveness. Thus, new levels of specialisation in which the Basque Country is more competitive, are added to the multi-sectoral nature with which the parks were founded; one of these is Advanced Manufacturing and Industry 4.0. After years of work, the first results have led to the establishment of top pioneer initiatives in this field, which are described in the next chapter.

4.2. **PIONEER INITIATIVES ON ADVANCED MANUFACTURING AND INDUSTRY 4.0. IN THE BASQUE COUNTRY.**

In the field of Industry 4.0. and smart specialisation, major advances have already been made in recent years in the Basque Country. Three pioneer initiatives in this field are presented below, articulated through the Basque Technology Parks and jointly promoted by the main Basque institutions.

- **Advanced Incubator in advanced manufacturing:** located in Bizkaia Science and Technology Park, the 6000 m² advanced incubator and entrepreneurship centre, called BIC Bizkaia¹³, is focused on priority sectors such as Industry 4.0.

Opened in autumn 2014, it is promoted by the Basque institutions together with the Park and has become a reference for start-ups and pioneer innovatives, hosting many cutting-edge projects in this field.

Being the first incubator of this kind in the Basque Country, and having received the award as the “Best practice” 2016 by the Spanish Association of Science and Technology Parks (APTE), the incubator has become a point of reference in the field of advanced manufacturing, fostering collaboration between top start-ups and business through different kind of programmes and initiatives.

- **Basque Industry 4.0. (BIND 4.0.) programme¹⁴:** BIND 4.0 is a public-private accelerator program with an international vision based on Industry 4.0. Its goals are twofold: on the one hand, the acceleration of start-ups by means of collaboration in large companies and on the other, the selection of businesses committed to and interested in capturing talent from the start-ups.

The initiative is promoted by the Basque Government and has the support of the leading Basque institutions, the incubators located in the Basque Country Technology Parks and the main Basque industries of international standing. Thanks to their strategical location, a good selection of the companies located in the incubator of the Parks have already taken advantage of this programme.

Following the success of the first edition, the second edition is already underway and is more international and more competitive. Thus, the Technology Park Network has become the main player in bringing together cutting-edge businesses projects working on sectors of the future and collaborating closely with entrepreneurs and cutting-edge businesses in Industry 4.0. and Advanced Manufacturing

- **Centre for Advanced Manufacture, CFA¹⁵.** The Centre for Advanced Manufacture is a space, representative of the whole of the Basque Country, which will permit optimisation of the Basque industry's potential to offer high valued added industrial products and services. It is a public and private initiative promoted by the University of the Basque Country, the Basque Government, the Regional Government of Bizkaia, and nearly 40 companies from the aeronautical and machine tool sector, including both clusters of reference.

Founded and based in the Park, the Centre is responsible for conducting tests in its laboratories which will help to increase business competitiveness, with the use of latest-generation technology.

It enables the validation of advanced technological developments in the auxiliary industry of the sector, guaranteeing transfer to the market for its subsequent improved commercialisation. It also permits the profits of activities with a cost, only an assumable one, to be shared collectively. Without doubt an international milestone, as the European Union itself refers in the Horizon 2020 Strategy to the creation of this type of structure.

Following several years of work, its start-up represents a milestone at the Park, and will contribute to generating value through Industry 4.0., promoting collaboration in the research and design of advanced manufacturing technologies, and in the subsequent transfer of results to said R&D of the industrial stakeholders through specific projects.

5. TRACKING INNOVATION: DIVERSIFICATION AS A KEY DRIVER FOR PROSPERITY POSITIONING AS A LEADER REGION IN EUROPE

Thanks to commitment to areas such as Industry 4.0. and the efforts of the different Basque administrations in recent years, the Basque Country has established itself as a driving force behind innovation at international level.

Thus, the Regional Innovation Scoreboard¹⁶, promoted by the European Commission places the Basque Country as a “remarkable” innovative region standing out from the general tendency in Spain, as the most innovative region in the country and at the level of other prosperous European cities and regions, excelling in all the indicators.

The scoreboard states that Specialisation in Key Enabling Technologies (KETs) increases regional innovation performance, and reveals that the most innovative regions are located in the most innovative countries, although regional innovative hubs exist in moderate innovator countries. This is the case of the Basque Country and few other additional regions of Europe.



Figure 3: Regional performance groups RIS 2017

Source: European Commission: Regional Innovation Scoreboard 2017

After decades of work, we are able to confirm that the commitment of the different Basque institutions to diversification towards the new high development potential and technologically advanced sectors has demonstrated the need to continue driving new sectors of the future from the Technology Parks, as is the case of Industry 4.0. and Advanced Manufacturing in order to continue moving forwards along this cutting-edge path of excellence.

New sectors, such as Advanced Manufacturing, can be said to provide value to the system as new highly technological sectors, enhancing collaboration among the different stakeholders from the science, technology and innovation system and promoting the transfer to the market of the new highly competitive and technological products.

6. **CONCLUSIONS AND FUTURE PERSPECTIVES: STPS VS AREAS OF INNOVATION. MOVING TOWARDS THE NEW DIMENSION**

Areas of innovation mirror the changes and the high pace of contemporary economies, and their best participate as leaders in the process. While fairly a new phenomenon, they transform knowledge-based economies and societies in territories aiming at sustainable growth and the development of cities and regions¹⁶.

The development of these new spaces, provides a sense of belonging and affiliation to the members of the area of innovation, both tenants and talent, bringing them together with more than a physical connection, as occurred in the traditional parks. International networks of talent, universities, companies, and clusters contribute to the global links of an area of innovation¹⁷

Globalisation has brought with it a series of changes that have affected international economies at all levels. To remain competitive at global level, and to continue at the forefront of science, technology and innovation, it has been necessary to redefine the value proposition of the Basque Parks. A value proposition which permits the impact of actions to be maximised and a meeting point to be found between the different stakeholders making up the quadruple helix favouring networking, creativity, the exchange of knowledge and commitment to global talent. This value proposition should welcome new actors on board and should include the new emerging sectors such Industry 4.0. or advanced manufacturing which have already become key players for the natural evolution of the innovation ecosystem in the Basque Country.

To evolve from the Technology Park concept to an Area of Innovation, the steps already achieved and proposed by the Parks will include the connection of the different ecosystems of innovation developed through the territory, and also:

- A shared strategy for **talent attraction and management** that will include the main city as a new agent in the process.

In fact, there is a direct correlation between the ability of a city to gather highly skilled people and the region's potential for innovation and economic growth. Generating ideas and their processing as innovative tools applied to business no longer depends on classical items of business location: the very personality of the city becomes crucial in creating and attracting certain groups that provide new capacities and growth potentials for the region¹⁸.

- The **participation of the different actors of the ecosystem** towards a common value proposition: the establishment of a shared space requires coordinated commitment among the different institutions in order to redefine a value proposal to remain at the forefront in science, technology and innovation and to maximise the impact of the measures through meeting spaces which favour networking, creativity and the bringing into contact of the different profiles of professionals, and highly qualified individuals from different environments.
- A high-class and tailored wide range of **added-value services**, to move from the era of top infrastructures to the era of knowledge, in which the exchange of knowledge and collaboration generates new opportunities for business and for the professionals in these spaces.
- The validation of **greenfields and brownfields** for the development of new science, technology and innovation spaces:
Regardless of their origin, both Greenfield and Brownfield developments need to create an ecology of innovation that will include all the stakeholders of the ecosystem. The starting point may be different but the vision is the same¹⁹.
- The establishment of a **smart specialisation strategy**: focused on the fields in which the region has strong specialization and skills, namely advanced manufacturing and Industry 4.0., one of the key areas for strengthening and making the most of the industrial tradition in the Basque Country.
- Development of **spaces and initiatives to promote the strategic sectors**: the opening up to new strategic sectors of the future, as is the case of Advanced Manufacturing and Industry 4.0., and the setting up of spaces such as the Centre of Advanced Manufacturing or the specialised Incubator, permit confirmation of its participation in the ecosystem, providing value, offering differentiation and promoting collaboration among the different stakeholders in the system.

Throughout this paper, it has been described the evolution of the Basque Country as a hub for innovation and talent, and the main challenges to face in a near future. For more than 30 years, the Technology Park Network has proved itself able to adapt to changing times at the same time, preserve its roots and industrial tradition by converting them into a differential value, adapting the value proposition and strengthening the joint work of the different institutions. The next challenge includes a movement towards the development of an area of innovation, with the support of those sectors with a high growth potential, as is the case of Industry 4.0., while combining talent, science, technology and innovation and including the city as a point of reference and convergence.

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