



INTERREG EUROPE

STRING PROJECT: *S*trategies for *R*egional *I*Nnovative Food Clusters

ACTION PLAN
PROJECT PARTNER 7 & 8
Castilla y León Region

- Institute for Business Competitiveness of Castilla y León (ICE)
- Food Industry Cluster of Castilla y León (VITARTIS)

August 2019

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Part I. General information

Project: ***STrategies for Regional INnovative Food Clusters (STRING)***

Partner organisation: Institute for Business Competitiveness of Castilla y León (ICE)

Other partner organisations involved (if relevant): VITARTIS Food Industry Cluster of Castilla y León

Country, region: Spain, Castilla y León

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Self-defined performance indicator: Number of agro-food companies performing innovative activities at regional level : 25.

Part II. Policy context

The Policy Instrument addressed is the **ERDF Regional Operational Programme of Castilla y León 2014-2020**.

ERDF Operational Programme of Castilla y León is structured in five priority axis, linked to five thematic objectives:

1. Fostering R&D and Innovation
2. Improving the use, quality and access to ITCs.
3. Improving the competitiveness of the small and medium-sized enterprises.
4. Low carbon economy in all sectors.
5. Preserve and protect environment and promote the efficiency of resources.

Priority number 1 concerns STRING project. The objectives of the region are in line with those of STRING:

- Strengthening R&D and Innovation institutions and improving the R&D infrastructures. (O.1.1.2)
- Promoting R&D&I activities by enterprises and supporting the creation and consolidation of innovative SME's (O.1.2.1)
- Transferring new technology and fostering cooperation between innovation chain entities (O.1.2.2).

The specific objectives of the priority 1 mentioned above are:

- Encouraging projects of regional interest in research, development, demonstration, transfer and innovation.
- Providing and modernizing infrastructures for research and innovation.
- Promoting the transfer of university-business knowledge.
- Promoting entrepreneurship and the outer opening of the technology industry.
- Raising awareness of entrepreneurship in education.
- Supporting companies specializing in innovation and internationalization services.
- Promoting technological investment by SME.
- Developing actions to facilitate business financing.

The final purpose is to increase the intensity and quality of R&D& innovation expenditure with regard to GDP in CyL. (1,14% in 2014) to make it closer to the UE27 figure (2,06%) since scientist and technical researches are key components to economic growth and competitive improvement.

ICE, as a regional public entity, implements programs, policies and financial measures related to national and international R&D&I policies and programs assisting the private sector. ICE has financed more than 32.000 projects for enterprises, mobilizing more than 3.200 M€ of investment in the private sector of the region. Approximately, 15% of the supported projects by ICE are agricultural and food projects. ICE collaborates with other regional agents (RTD infrastructures, universities, regional ministries, and also the managing authority) in order to generate the most appropriate food-innovation ecosystem and to foster cross-collaboration. *ICE is in charge of the managing of innovation ERDF funds and the Director of the Innovation and Entrepreneurship Department will endorse this action plan by signing the document.*

Vitartis as a regional agri-food cluster, promotes the competitiveness of the food industry in the region and enhances the collaboration between companies and research agents and it is also in contact with other international players. ICE is in charge of the managing of ERDF funds and the Director of the Innovation and Entrepreneurship Department will endorse this action plan.

Regarding the indicators ICE Self-defined performance indicator is 25 agro-food companies performing innovative activities at regional level. It is expected to influence in 8 million € of Structural Funds.

We consider it is feasible to achieve this indicator through the project. There aren't additional or unexpected factors from the beginning of the project up to now, so everything goes as it was planned when the project was presented.

Part III. Details of the actions envisaged

III.1. Nature of the action.

This Action Plan is based in the learnings derived from:

- **Engines for change document**, produced by STRING project partners, through which we can compared agri-food sectors from regions participating in the project:

Rural areas in Castilla y León represent 96.2% of the total area. The average population density is lower than in Spain (10.4% against 18,6%), but it is higher in rural areas (36,9% against 16,7% at national level). Farming and food industry are the main economic activities of the region: Primary sector represents 3,8% of the regional VAB (2014), while food industry is 5,7% of this value in 2014 (last data published). Food companies have a turnover of 10.347.000€ and generate 35 529 jobs. This represents 29,23% of the regional industry turnover and 29,63% of the employment generated by industry in Castilla y León.

Regarding company size, 99,4% of food industries in the region are SMEs, and 81,9% are micro-SMEs (less than 10 employees).

The quality of the food products, the high specialization and the internationalization of the food companies have facilitated the increase of food industry competitiveness during last years and despite economic crisis, even creating new jobs, while other sectors have destroyed them (rate of change of 0.1% and -0,9%, respectively, during 2014).

In regards to exports, the trade balance is positive since 2005 (exports>imports). Food raw materials and food industry exports represent, jointly, 11,3% of the total value of regional exports. The main market for food exports is EU (75,58%), following far behind by Asia (9,5%). The main groups of products exported are meat, dairy products, drinks, and bakery and confectionery.

However, the regional agri-food sector has also weakness: it is widely scattered, with small, family firms dominating the market. Approximately 3,500 companies operate in agri-food industry in the region, which have a business duality, due to the coexistence of family businesses operating in local and/or regional market and which have a craft production focusing on quality, with large multinational companies that have automated and market-oriented chains.

Besides, there are some specific barriers when it comes to RDI, as geographic dispersion of the industrial infrastructure, lack of qualified human resources and lack of collaboration culture with universities and research centres. These barriers are even greater in the case of the agri-food sector due to the higher percentage of SMEs and its higher dispersion in rural areas. Taking also into account that this sector represents more than 30% of the industrial sector in CyL, it is paramount to work to boost innovative activities in it, since a small improvement will generate a great impact.

- **Regional Learning needs document**, produced in the first phase of STRING project, highlighting:

- Lack of culture of cooperation among SMEs with RTD and innovation infrastructures.
- Lack of alignment among RTD infrastructures, (research centres, Universities...) with agri-food sector needs.
- Low involvement of SMEs in R&D programmes, calls and projects.
- Low evolution from SMEs to Mid-Caps.
- Lack of strategies to create high added value food products.
- Low deployment level of the sustainability concept in the sector
- Difficulties to commercialize R&D project results on SMEs.

Since tackling all of these needs through STRING project would have been too ambitious and unrealistic, a prioritization of the learning needs was made at the beginning of the project, where two of them were identified:

- Lack of culture of cooperation among SMEs with RTD and innovation infrastructures
- Low involvement of SMEs in R&D programmes, calls and projects

Besides, based on the experiences, insights and good practices, shared during the knowledge exchange phase by other European partners, and also on the feedback of the regional stakeholders, a new need was included as a priority:

- Low deployment level of the sustainability concept in the sector.

So this Action Plan is focused on providing answer to the three learning needs prioritized above.

Since the self-performance indicator is “number of agri-food SMEs performing innovative activities”, it is clearly related to the needs detected, because an increase in the indicator’s value will only happen when new food companies started to participate in RDI support programme and calls, which also will generates more collaboration with RTD infrastructures, since the public programmes promotes collaborative projects in many cases. Besides, in the mid-term, it is expected that these new collaborations would have an indirect positive effect on the alignment among research institutions and food sector’s needs.

- Project partner’s good practices:

- **LIB programme from North Brabant** (<http://www.stuurgroeplib.net/>): this programme was presented during the site visit that took place in June 2018 to this region of The Netherlands.

This programme is the result of a public-private collaboration among ZLTO and the province of North Brabant, and is was launched in 2011 for first time. Basically, the activities of the Steering Committee of LIB programme have three different approach:

- Implementation: throughout innovations supported by projects.
- Strategic: Based on thematic meetings hold around a different topic: farming, markets, relation among agriculture, food and society...
- Vision: as a representative platform, they discuss these topics from a social perspective, establishing connections among policies, organizations and needs detected.

Regarding thematic meetings, they hold about four per year, discussing about the challenges and barriers to be overcome in next years. For example, during the Knowledge exchange phase of STRING project, they were working in the development of their food strategic for 2030. North Brabant’s team explained that they invited millennials to this meeting, in order to have their opinions and ideas about the agri-food ecosystem they would like to have in ten or fifteen years.

In relation to the innovation projects supported, they fund small projects that should have a direct positive impact in farms. These projects should be focused on one of the following topics:

Making agriculture more sustainable and socially integrated:

- Biodiversity
- Soil quality
- Healthy environment
- Circularity; closing mineral loops

New business models:

- New business connecting urban – rural
- Diversification of activities on the farm.

Adding value by new product market combinations

- Biobased economy
- Niche products
- Alternative proteins

Transferrable aspects: The key components of this programme identified were:

- The thematic meetings, for which they identify relevant stakeholders that should be involved.
- Flexible budget, which means the entry of small business to the innovation system.
- Administrative simplification (2 pages)
- Quick answer (up to three months maximum)
- Flexibilization of the participation terms: Evaluation focused on the real impact of the project, making almost an individual assessment of the financial conditions and the staff participating on the project in each case.
- Personalized technical support from the LIB programme's team.
- Promotion of more sustainable agriculture models and new business chains on bio-based products

So, this action plan is based on the key components identified in the LIB programme.

- **The public-private triple helix partnership**, from Central Denmark Region. The idea of working in a network of collaboration to build a coherent innovation ecosystem is the clue of this good practice. The cooperation among the different agents of the innovation environment avoid a confusing and distracting system for companies and unify resources.

Transferrable aspects: This idea will help us to influence in the lack of alignment of some RTD infrastructures with agri-food sector's needs. Those Regional Group Forums means the establishment of a regional network for prioritization of the business development initiatives. Goals from those groups joint with goals from the second action of this action plan:

- Enhancing innovation capacity and differentiation in the food sector of the region.
- Help to create shorter distances between companies and knowledge communities.

- **Derecske Orchard**, a Hungarian Company visited by project partners in Debrecen, (<https://derecskegyumolcsos.hu/>), aligned with this action plan because of the strategy of commercialization of the products that come from the R&D projects.

Transferrable aspects: The importance of the sustainability and the bioeconomy in this action plan is directly related to this good practice. This company, operated by Bold Agro Ltd, is a good example that combine innovation and tradition with new quality products and new ways to commercialize them. Derecske Orchard is working with sustainable methods and works also with bioproducts. The company is operating with a strategy of marketing to show their products to the citizens through different action lines:

- The Orchard Pedagogical Program focus on schools and kinder gardens, with activities for about 4500-5000 children every year where they show the company and what do they do.
- The Apple Flower Restaurant, where they serve meals made from their own processed fruit and the raw materials produced in the region in the form of short supply chain.
- The visitor centre with exhibition halls, classrooms and thematic parks.

Those options are relevant for Castilla y León region to become a living example not only for the consumers, but for the workers of the companies and other agrifood producers.

- **Outputs from the stakeholder group meetings.** The group is composed by agents from the regional innovation ecosystem:

- Public sector (national, regional and local administration)
- Science and innovation (universities, clusters, and technological centres)
- Companies (SMEs, Big Companies, Self-Employment. Entrepreneurs)
- International and national networks (APTE (Association of Science and Technology Parks of Spain), Enterprise Europe Network, ERIAFF, ECSO, ERRIN, EURADA, Regional Development Agencies Forum (RDAs), ERANET, S3P on Industrial Modernisation, among others) financial shuttle and other facilitators (Foundations, associations).

The background of those agents in the region support the project from the beginning and they will continue doing it for the coming years. The network generated among the participants allow to flow the initiatives, information, proposals and to be closer to the agrifood SMEs. Demands, needs and suggestions from those agents are taking into account for the public administration to contribute in policy instruments.

- **Site visits and staff exchange** done in Debrecen (Hungary), Eindhoven (Netherlands) and Emilia Romagna (Italy), visiting companies facilities and institutions, and talking to technicians, responsible, directors about their way of working and their situation of the agri food sector in the region.

III.2. Reaching the objectives

The two general objectives to be reached through the implementation of this Action Plan are:

1. Promoting the competitiveness of the agri-food sector through the development of R&D&I strategies in agri-food SMEs.
2. Identifying new opportunities and value chains related to sustainability and bio-economy, in order to promote regional competitiveness, especially in rural areas.

To reach this objectives, five specific subobjectives have been established:

- Promoting the participation of agri-food companies on regional R&D&I programmes, not only to develop specific projects, but also to gain innovation culture that allow them to enforce successful innovation strategies in the middle and long term.
- Fostering private inversion on R&D&I. The participation on R&D&I public programmes involves also private inversion, which will have a positive effect in agri-food sector competitiveness.
- Creating new qualified employment and multidisciplinary teams: R&D&I's activities and management are usually developed by technicians with academic qualification, which supposes to incorporate young talent to food companies. Besides, the development of R&D projects will promote the involvement of different profiles: (technicians, production area staff), helping to change the organization culture.
- Stablishing new working methodologies involving stakeholders from different areas of the innovation ecosystem, to analysing the potential of bioeconomy resources in the region, the state of the art of the viable technologies, and to define new initiatives and programmes in this field.

The specific resources to reach the objectives are described in the actions proposed, but basically, the resources needed to develop the action plan are:

- Human resources from ICE: The team in charge of the design and development of public programmes, and the ex-post evaluation of the proposal presented, is the responsible of readapting some of the calls in order to facilitate the participation of the agri-food sector. To do this, they work at internal level, jointly with the staff participating directly in the project, to analysing the good practices selected in order to draw key components and to apply them in the new or rebuilt calls.

In the same vein, the team in charge of boosting and making dynamic the bioeconomy group belongs to ICE. Since ICE is in charge of the innovation policies, it counts with a wide contact network in the regional innovation ecosystem, which facilitates, at first instance, the identification of the agents and stakeholders to be involved in the working group. Also the institutional nature of ICE will facilitate the positive response of all agents invited to participate. It important to highlight that, the success of this initiative needs the active participation of the

agents involved, in order to establish areas of work realistic and in line with the interest of the whole sector. So, the Knowledge and experience of technological centres, jointly with the data about potential resources provided by agri-food, forest-based sectors, and public entities is paramount to have a good starting point.

- Human resources from Vitartis: Vitartis team provides the agri-food sector perspective, based on its ten-years-experience helping their members on the development of R&D&I strategies, and in the good practices presented during STRING project. They work to provide practical suggestions to help ICE to improve the calls and to eliminate barriers detected to agri-food SMEs' in them. They also work in the second action proposed: Vitartis has a wide network of innovation agents, at regional, national and European level. So its team works to identify potential stakeholder who can participate in the bio economy working group, to identify similar initiatives in other European region, and to propose actions to be developed in the frame of the working group. Vitartis also collaborates with ICE to energize the working group and to disseminate its actions and outputs, and promoting collaborative initiatives in the bio economy field at regional level.

- Economic resources: As it is mentioned above, the budget of the new calls belongs to the priority 1 (Fostering R&D and Innovation), of ERDF Operational Programme of Castilla y León. In the case of the Bioeconomy and Circular Economy working group, there is no need of economic resources, since its objective is to identify opportunities and to promote raising private funds and European and national public funds to initiatives in the area of bio economy.

III.3. Actions

III.3.1 Action1: Improve regional support in SME's to increase their participation in calls for business competitiveness.

1. Background

Lesson learnt	Source of the lesson
Detecting needs	<ul style="list-style-type: none"> Engines for change document Regional learning needs Stakeholders proposals
Administrative simplification	<ul style="list-style-type: none"> LIB Initiative from the Netherlands (Landbouw Innovatie Brabant) Stakeholders proposals

Flexibilization of the participation terms	<ul style="list-style-type: none"> LIB Initiative from the Netherlands (Landbouw Innovatie Brabant) Stakeholders proposals
Quick answer	<ul style="list-style-type: none"> LIB Initiative from the Netherlands (Landbouw Innovatie Brabant) Stakeholders proposals
Personalized technical support	<ul style="list-style-type: none"> LIB Initiative from the Netherlands (Landbouw Innovatie Brabant) Stakeholders proposals

This action will establish a range of measures to enhance the participation of agri-food SMEs on the R&D public programmes. The success of this action, will be measured by the number of agri-food companies which have received a financial support by ICE calls for R&D and innovation of Castilla y León OP (priority axe 1)

Agro-food companies could participate on this calls directly (applying to R&D calls by themselves or in collaboration with other entities). Besides this, we will consider as “innovative activities” the ones developed by technology centres, through innovative diagnoses that allow the companies to improve their R&D capacities (in-kind assistance from ICE to perform different initiatives).

2. Action

The action will be the inclusion of modifications progressively in ICE financial calls, according to SME´s demands, stakeholder demands, learning needs detected in the region and good practices presented during the project, in order **to increase the number of companies participating in the calls.**

For this, the activities that will be developed are:

- Analysis of the financial calls open at regional level, its requirements, evaluation conditions, applicants, and projects financed so far.
- Selection of the calls considered with more potential to agri-food sector, and elaboration of the modification proposal of the aspects and barriers detected, based on the key components presented above.
- Communication and dissemination of the new conditions of the calls among the agri-food sector in order to promote its participation.

First modifications of the calls were done in the second semester of 2018 and the new ones are expected in 2019, as a result of the analysis of all the information mentioned above. ICE

is in charge of those financial calls so it can manage the changes and add requirements that make easier to apply for a financial support for the companies. Those calls are non-repayable grants co-financed by ERDF.

The project was designed to influence in the ERDF Operational Programme of Castilla y León, thorough the first of the sixth priorities: Fostering of R&D&innovation with the objective of strengthening R&D an innovation institutions and improving the R&D infrastructures; promoting R&D&i activities by enterprises and supporting the creation and consolidation of innovative SME's; transferring new technology and fostering cooperation between innovation chain entities. Within this priority 1, open calls will be revised and studied, and those considered more suitable for Agri-food sector will be modified.

Two of these calls have been already studied and modified and launched on 23th May 2018: Call for R&D projects: The modifications where based on the key components of LIB program listed above and consist on:

1. Broaden the profile of potential applicants including the participation of MIDCAPS (medium capitalization companies, up to one thousand employees), and the possibility to present singular projects (projects which have been favorably reported in international calls like H2020, COSME...but did not reach the score to be founds).
2. Budget flexibilization: From 20.000 to 700.000€, in the previous one the limit was 150.000€.

Call to R&D Strategic Plans: the modification in this case consist on the simplification of the description about the professional categories of the staff involved in the project in order to boost the participation of multidisciplinary teams. This modification in based on the key component "- Flexibilization of the participation terms" identified in the LIB programme.

Those changes involve politics, directors and heads of the different departments of ICE (Sectors, Innovation and Knowledge Transfer and Entrepreneurship)

STAKEHOLDERS INVOLVEMENT IN THIS ACTION

Stakeholders will be involved before the modifications, providing information about what are the needs of agri-food companies, and after them, to collaborate in the dissemination of the information of the calls (websites, trainings), in order to better support companies in the elaboration of the application and stimulating them to participate in the call. The stakeholders involved in this action belong to the Innovation and Entrepreneurship Network of Castilla y León (REDEI.ES). ICE is the secretariat of this network, and some of its members, related to the agrifood sector are

- Public institutions: Town halls of the main cities of Castilla y León (Valladolid, Zamora, Burgos...) and provincial councils.
- Universities and technological centres who collaborate with agri-food sector in R&D projects: Salamanca University, Burgos University, León University Isabel I de Castilla University, Miguel de Cervantes European University, CARTIF Technology Centre, CETECE (Technology Centre for Cereals...

- Vitartis, agri-food cluster of Castilla y León, who is in direct contact with agri-food SMEs and knows the barriers they find when it comes to apply to regional funds and public Universities from León, Burgos, Salamanca and Valladolid, who collaborate with agri-food sector in the development of the proposals to the regional calls.

Once the calls will be modified, Vitartis will inform their members about new calls. This information will be directly delivered by e-mail to the person in charge of R&D strategies in every company, previously identified when the entity joined the cluster. The information will be previously elaborated, in order to make it easier to understand, and to facilitate the identification of the key components of the call. Vitartis will also work as a help-desk for those who are not used to participate in public calls, solving queries about the procedure.

ICE will also work in the dissemination of the new calls. Information about them will be published in www.empresas.jcyl website and the regional directors will present the news through Centr@tec Program. This Program gives advanced support to SME's and it is structured in training actions focused in Innovation in Processes and Products/Services, Incorporation of ICT technologies and Digital Marketing, Immersion in 4.0 technologies, Bioeconomy and Circular Economy. Actions take place in all the region and in 2017-2018 there were around 150 actions. In each training the Regional Director of the province where that event is taking place, present and explain the participants how to apply for a financial call. Regional DG's are a contact point for companies to solve their doubts about requirements and the procedure of the calls.

3. Timeframe + cost

Calls are open from their publication up to the end of the grant or up to the publication of a new one that substitute the last one (Operational Program 2014-2020), so modifications will be done along this period.

ERDF grants:

- 70,24 M€ to boost R+D+i
- 87,36 M€ to improve competitiveness in SMEs.

These grants have been incremented (19/12/2017) in 4M€ as a consequence of the redistribution of the aims and productivity indicators respect to the initial approval.

In terms of the cost of the action, this action is going to be covered by internal resources (human resources). The estimated staff cost is 30.000 €, resulting of two people working 50% of their time for a year.

4. Target group

The target group are SMEs or midcaps located in the region, financing the sectors included in the RIS3 priorities, public and private universities, technological centres, non-profits bodies with R+D+I legally defined as an activity of the centre. ICE is in charge of the modifications to include in the new calls. Members of stakeholder group disseminate ICE financial calls among the companies.

5. Risk factors

2019 is expected to be a year with a lot of changes. General elections will be in April, regional and local elections will be in May, so maybe unexpected changes/actions will take place.

6. Summary

The Action plan of ICE is designed to improve the support to SMEs in Castilla y León Region, especially in rural areas, based on the contributions of VITARTIS, the suggestions done by STRING stakeholder group, the good practices identifies in Europe and the demands of the companies in the region.

The main goal is to stimulate the participation of the SMEs, and therefore, its competitiveness, through improvement of ICE Programs. ICE as Regional public entity, is in charge of the implementation of R&D&i programs, policies and financial measures at national and international level, supporting private sector, with a wide experience financing projects (more than 32000) and collaborating with other regional agents in order to generate the most appropriate innovation ecosystem. The development of this Action Plan and the implementation of its measures will allow influencing the policy instrument.

First action will be Improve regional support in SME's to increase their participation in calls for business competitiveness, improving the conditions to access to the grant, trying to stimulate the participation of the SME's.

Action 1 is influenced by the good practice provided by Central Denmark Region with the Regional Group Forums (triple-helix political organization) and LIB Initiative from the Netherlands (Landbouw Innovatie Brabant).

III.3.2 Action2: Improve regional support to the BioEconomy and Circular Economy Regional Working Group (GTBEC) to promote the participation of SMEs on circular bioeconomy projects/calls.

1. Background

Lesson learnt	Source of the lesson
Detecting needs	<ul style="list-style-type: none"> Engines for change document Regional learning needs Stakeholders proposals
Networking	<ul style="list-style-type: none"> Triple helix partnership, Central Denmark Region
Identification of the relevant agents	<ul style="list-style-type: none"> Triple helix partnership, Central Denmark Region Stakeholders proposals
Methodology of working	<ul style="list-style-type: none"> LIB Initiative from the Netherlands (Landbouw Innovatie Brabant) Stakeholders proposals
Improve commercialization	<ul style="list-style-type: none"> Derecske Orchard, Hungarian Company
Sustainability criteria	<ul style="list-style-type: none"> Derecske Orchard, Hungarian Company

In one hand, Agri-food and food industry waste, jointly with forest residues are important resources in Castilla y León that are practically unexploited so far. On the other hand, the potential for research, development and innovation in agribusiness of Castilla y León is considerable: In our region are set four public and four private universities with recognized research groups in areas of agricultural research, veterinary, food technology or process engineering. To these must be added a large list of food and agricultural technology centres with specific areas (CARTIF, INBIOTEC) and the presence of public research organizations (PROs) and the CSIC and the Agrarian Technological Institute of Castilla y León (ITACyL), the Agrarian and Agrofood Technology Centre (Itagra) and the Technology Centre for Cereals (CETECE). However, the lack of cooperation culture on SMEs and the lack of alignment among some RTD infrastructures with the agri-food sector are the main reasons why food and forest waste are not yet used for creating new business models. In this context, the main objective of this action is to create a group of agents with the knowledge, capacities and skills to promote new initiatives in the area of bioeconomy.

STAKEHOLDERS INVOLVEMENT IN THIS ACTION

The group was launched in June 2017 and the members were originally STRING stakeholders, which have been participating in the project from the beginning. The group began as a

Bioeconomy group and recently it has been added the concept of Circular Economy (GTBEC group) to act in sustainability in our region.

Stakeholders of the group have grown, and nowadays it is composed by:

- Presidency: Technological Center, CARTIF Foundation
- Secretariat: ICE, Innovation and Entrepreneurship Department. Sectors Area.
- Members:
 - DG Industry and Competitiveness
 - ITACYL, Agricultural Technological Institutio of Castilla y León
 - DG Natural Environment
 - EREN, Public Institution of Energy of Castilla y León
 - INBIOTEC, Biotechnological Institute of León
 - VITARTIS, Food Industry Cluster of Castilla y León
 - Natural Heritage Foundation of Castilla y León
 - Technological Center of Miranda de Ebro
- With the collaboration of:
 - URCACYL, Regional Union of Agrarian Cooperatives of Castilla y León
 - GEO, Group of Sheep Entrepreneurship
 - CESEFOR, Center for services and forest promotion of Castilla y León
 - AGROPAL, AgroCooperative of Palencia
 - BIOTECYL, Health Cluster of Castilla y León
 - AVEBIOM, Spanish Association of Energetic Valorisation of Biomass
 - AEICE, Cluster for the social and economic promotion of the region
 - CYLSOLAR, Cluster of Renewable Energies and Energy Solutions in Castilla y León
 - USAL, University of Salamanca
 - FUNGE, General Foundation of the University of Valladolid

This action has been inspired by Central Denmark Region, with their good practice in the creation of a public-private triple helix partnership approach on building one coherent innovation ecosystem. The key components identified from this good practice are:

- The identification of the relevant agents at regional level to be involved in the promotion of R&D&innovation in a specific field (public-private triple helix partnership)
- The establishment of a methodology of working with them at mid- and long-term to enhance innovation capacity and differentiation.

Regarding the identification of the relevant agents, we have work to involved actively the suitable organizations in the GTBEC group, reaching public authorities with competences in agri-food forestry and environmental issues, technological centres and universities with

technical Knowledge, clusters representing the business sector in order to create a public-private triple helix partnership

This approach will help us to influence in the lack of alignment of some RTD infrastructures with agri-food sector's needs, and to improve the low deployment level of sustainability concept in this sector.

The establishment of a methodology of work has been done by the identification of areas of work throughout different dynamics (brain storming, design thinking...) , named of responsible of these areas or work, establishment of periodical meetings to follow-up the task scheduled, and creation a common digital space to share information

Also the inspiration comes from the good practice of Northern Great Plain (Hungary) in Derecske Orchard Hungarian Company, Derecske Orchard (<https://derecskeigyumolcsos.hu/>), because of the strategy of commercialization of the products that come from the R&D projects. The importance of the sustainability and the bioeconomy in this action plan is directly related to this good practice. This company, operated by Bold Agro Ltd, is a good example that combine innovation and tradition with new quality products and new ways to commercialize them. Derecske Orchard is working with sustainable methods and works also with bioproducts. The company is operating with a strategy of marketing to show their products to the citizens through different action lines:

- The Orchard Pedagogical Program focus on schools and kinder gardens, with activities for about 4500-5000 children every year where they show the company and what do they do.
- The Apple Flower Restaurant, where they serve meals made from their own processed fruit and the raw materials produced in the region in the form of short supply chain.
- The visitor centre with exhibition halls, classrooms and thematic parks.

.Therefore in this case, the key components identified are:

- Production chains based on sustainably, socially responsible and environmental-friendly principles to give response to society demands and also to generate added value in the agri-food sector.
- Communication and marketing strategies focused on giving direct experiences to costumers in which they can understand the principles and policies of the sector and how sustainability contributes also to social welfare and economic development.

2. Action

The objective of the action will be to improve the support of the Bioeconomy and Circular Economy Regional Working Group in order to increase the number of SME applying to ICE financial calls through Bioeconomy and circular economy projects. The key components identified in STRING good practices will contribute to work with the GTBEC with a new methodology which will help to consolidate the group and create a strong regional network. As

a first result of the work of this GTBEC group, a common project has been proposed and will be developed during the next two years (INBEC project), working together in Bioeconomy and Circular Economy in our region and getting also an interregional cooperation with some areas of Portugal. This project and its methodology will allow to [create awareness and Knowledge in the area of circular economy among the agri-food sector, and therefore, agri-food companies will be ready to generate](#) new projects in the region in the field of Bioeconomy and Circular Economy. Consequently, we will have, the increase of participation of SMEs in financial calls, regarding bioeconomy and circular economy, calls financed by the Operational Program addressed in this project. This initial project has been built in the stakeholders' meetings and members of the group will be partners in the project.

The launch of INBEC project will help the group to give a better support to SMEs in the region, promoting their participation in ICE financial calls.

The project will be launched in autumn 2019 and ICE will be the coordinator.

Stakeholders of the project will be:

- Institute for Business Competitiveness (ICE)
- University of Salamanca (USAL)
- CARTIF Foundation
- Natural Heritage Foundation of Castilla y León (PRAE)
- Provincial Government of Ávila
- INBIOTEC, Biotechnological Institute of León
- Instituto Politécnico de Bragança (IPB) - Portugal
- Pedro Nunes Institute (IPN) - Portugal

The project will be developed in the provinces of Valladolid, Zamora, Ávila, Salamanca and León and also in the cross border areas of the region, north and center of Portugal.

Actions planned are:

- Through personalized visits it will analyze how Bioeconomy and Circular Economy is in those areas (a document with all the data will be produce), based in stakeholder proposals and under the frame of the GTBEC networking generated thanks to the inspiration in the Triple helix partnership, Central Denmark Region
- As a result of this research, individual diagnostics and implementation plans will be planned (7 Implementation Plans will be done) based in LIB good practice
- Training actions and workshops will be organized to develop the offer of Bioeconomy and Circular Economy products and services (At least 18 actions will be done)
- It would be created a Project Bank for innovative projects, to support companies on the development of new productive activities (At least 22 projects will be in the project bank))
- Promoting the demand and develop of markets with individual plans of digital marketing, through training actions and workshops, and individual diagnostics and implementation plans (At least 34) - Joint Commercialization plan

- International Forum
- Promotion and communication plan

Those last four points have been inspired by Dereckse Orchard experiences in Hungary. STRING stakeholders will be involved in the development of the actions planned: Visiting companies, organizing trainings and workshops and supporting companies under the project.

3. Timeframe + cost

GTBEC is one of the groups created under the umbrella of the Innovation and Entrepreneurship Network of Castilla y León (REDEI) which started working in October 2016 when was launched the Entrepreneurship, Innovation and self-employment Strategy of Castilla y León 2016-2020, and its ongoing now. The project, which will be the tool to consolidate the Bioeconomy and Circular Economy Regional Working Group, will be launched in October 2019 and will have a length of more than two years, up to December 2021.

The budget of the project will be approximately 2 million euros, 75% financed by the EU ERDF under Interreg Poctep Programme and 25% public/private collaboration. The project will finance the actions detailed below, focused in visits, trainings and action plans. As a consequence of the participation in INBEC project, regional SMEs will be more aware of the opportunities offered by circular economy and will apply to ICE financial calls, which are funded by the Operational Program addressed in STRING project.

Regarding the actions, timetable will be:

- Visits to companies, individual diagnostics and implementation plans - 2019/first semester 2020
- Training actions and workshops (offer) and Projects Bank - April 2020/December 2021
- Individual plans of digital marketing, trainings and workshops, individual diagnostics and implementation plans, Commercialization plan, International Forum and Promotion and communication plan - Second semester 2020/December 2021.

The distribution of the cost will be:

- Visits to companies, individual diagnostics and implementation plans – 400.000€ aprox.
- Training actions and workshops (offer) and Projects Bank – 1.000.000€ aprox.
- Individual plans of digital marketing, trainings and workshops, individual diagnostics and implementation plans, Commercialization plan, International Forum and Promotion and communication plan – 600.000€ approx.

4. Target group

More than one hundred members are involved in REDEI, the main agents of the ecosystem of entrepreneurship and innovation that come from public sector (national, regional and local administration), science and innovation (universities, clusters, and technological centers), companies (SMEs, Big Companies, Self-Employment. Entrepreneurs), international and national networks (APTE (Association of Science and Technology Parks of Spain), Enterprise Europe Network, ERIAFF, ECSO, ERRIN, EURADA, Regional Development Agencies Forum (RDAs), ERANET, S3P on Industrial Modernisation, among others) financial shuttle and other facilitators (Foundations, associations). The members of the Bioeconomy and Circular Economy Regional working Group are stakeholder from STRING project and the project itself will be coordinate by the Entrepreneurship and Innovation Department of ICE.

5. Risk factors

Risk factors identified are:

- Difficulties to stablish a clear definition and scope of the bioeconomy concept.
- Number of Bioeconomy companies in the selected areas.
- Number of companies working in Circular Economy areas.
- Companies size
- Level of innovation of the companies.
- Lack of human resources in companies.

Regarding these factors financial support provided by ICE financial calls could be one of the ways to solve that problems.

6. Summary

The Action plan of ICE is designed to improve the support to SMEs in Castilla y León Region, especially in rural areas, based on the contributions of VITARTIS, the suggestions done by STRING stakeholder group, the good practices identifies in Europe and the demands of the companies in the region.

The main goal is to stimulate the participation of the SMEs, and therefore, its competitiveness, through improvement of ICE Programs. ICE as Regional public entity, is in charge of the implementation of R&D&i programs, policies and financial measures at national and international level, supporting private sector, with a wide experience financing projects (more than 32000) and collaborating with other regional agents in order to generate the most appropriate innovation ecosystem. The development of this Action Plan and the implementation of its measures will allow influencing the policy instrument.

Second action will be to improve regional support to the BioEconomy and Circular Economy Regional Working Group (GTBEC) to promote the participation of SMEs on circular bioeconomy projects/calls. This action will be materialize through the launch of a new project of Bioeconomy and Circular Economy in our region, with actions that will involve SMEs

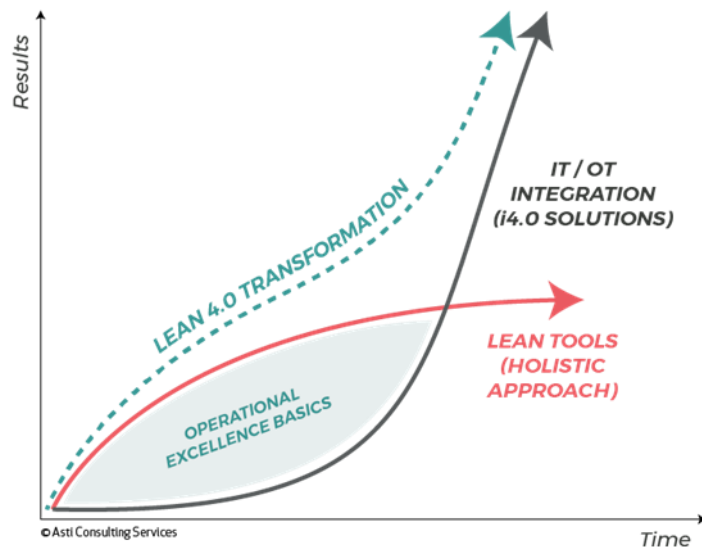
Action 2 is influenced by the good practice provided by Central Denmark Region with the Regional Group Forums (triple-helix political organization) and the good practice of Northern Great Plain (Hungary) in Derecske Orchard.

Part IV. Other areas of work identified through STRING project

Digitization has entered the agri-food sector, albeit the technology adoption and use are still in its initial phase. yet, some researchers suggest that digital technologies will lead to the next agricultural revolution, potentially reversing some of the most negative effects of the “green revolution” witnessed by the sector a few decades ago [Powell 2017, walter et al. 2017]. Digitization and new technologies raise hopes not only for improving agricultural productivity, but also for alleviating some of the most pressing global problems related to climate change and biodiversity loss. Several examples of that were presented during the site visit to North Brabant, (June 2018): Philips Growwise Center, where they develop specific projects for precision farming, or The Van den Borne potato farm, where they have implemented smart technologies in the whole process of production. These experiences has shown the prominence of including specific programmes to promote the adoption of smart technologie among the agri-food sector in Castilla y León.

The current technological advances in the sector have their roots in the precision agriculture concept, but at the same time go far beyond it. With the emergence of big Data, (massive volumes of digital data coming at high speeds from a wide range of sources and in different formats) new opportunities for the agri-food sector have opened up. Thanks to the internet of things, cloud computing and machine learning big Data can be analysed in real or near-real time to extract new insights and economic value for the benefit of virtually all actors in the agri-food chain. These opportunities might change farming into smart farming and other agribusiness operations into smart businesses. nonetheless, there are also various barriers that may impede a digital transformation in the agri-food sector. (Kosior K, 2018) Some of these barriers are the lack of technological Knowledge among SMEs to select the best technologies in every case, and also the lack of broadband connections in rural areas. In this line, it is necessary to establish potential areas of working regarding smart technologies, where public administration could support Castilla y León's Agri-food sector in its digital transformation. Although it won't be possible to address all of these measures in the frame of STRING project we consider it interesting to make a reflection about the future needs of the agri-food sector that should be taking into account for the next Operational Programme.

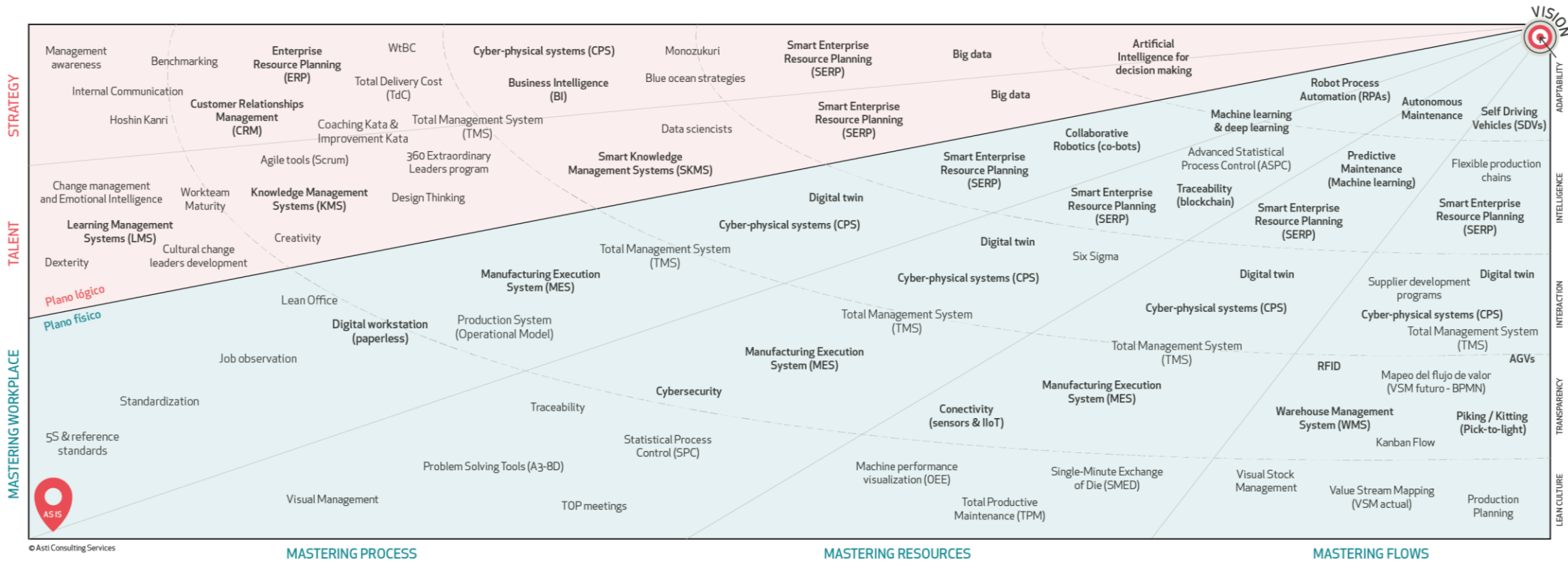
Below we included a chart indicating the added value provided by digital technologies over time. The red line represents the value offered by basic technologies (CRM...), which decreases throughout the time, while the green dashed line represents the value of the projects associated to more disruptive technologies that involve more risk, but whose value increased exponentially with time.



To define an appropriate roadmap towards 4.0 industry in the agri-food sector, it will be necessary to support the transformation process with a double strategy, with two different speeds:

- Boosting concrete actions to promote the implementation of digital technologies in the day-to-day management (operational excellence basics) to establish new behaviours and routines that allow to define a new industrial model (holistic approach) required to accelerate the transformation process, because neither lean tools or enabling and facilitating technologies can do it by themselves.
- Promoting more ambitious initiatives that allow the agri-food sector to link traditional technologies with emerging ones at operative-model level, that means to manage the technology with a comprehensive approach, from the corporate side to the plant production level, achieving to create IT and OP fully integrated systems.

In the chart below are represented different technologies in the phases of the digital transformation: “digitalization”, lean culture”, “4.0 industry” (In the upper right-hand corner it is represented the ideal state regarding digital transformation)





According to the information presented, it will be necessary a strong support from public administration to facilitate the adoption of digital technologies in the agri-food sector in next years. The measures and programmes to be launched will depend on the final beneficiaries to be reached. In this sense, it should be taken into account that agri-food SMEs are in most cases, in the “lean culture” phase, mentioned above:

SMES DIGITAL STAGE	NEEDS	RESOURCES TO MEET THE NEEDS DETECTED	POTENTIAL MEASURES AND PROGRAMMES FROM THE PUBLIC ADMINISTRATION
LEAN CULTURE	<p>Creation of a production system based on lean culture and its associated tools:</p> <ul style="list-style-type: none"> - 5S & reference standards - Standardization - Job observation - Lean office / service - Hoshin Kanri - Visual Management - Value Stream Mapping - Total Productive Management - Machine performance visualization (OEE) - Benchmarking 	<p>- Training and coaching in lean tools to promote new behaviours and routines in agri-food SMEs:</p> <p>- Training in change management in high uncertainty environments.</p> <p>- Investment: Pilot actions (internal resources and external consultancy) to test technologies before its implementation in other areas of the organization.</p>	<ul style="list-style-type: none"> - Awareness and training programmes. in lean culture in different areas of the region to facilitate the participation of SMEs - Identification and standardisation of external experts on digital technologies. - Programmes and calls for investment in small projects (pilot actions), including external support. <p>These are the first actions to boost the implementation of digital technologies in the organizations. Depending on the degree of industrial maturity it can take up to 2 years to bring in lean routines and behaviours in the organisational culture, so public programmes should be developed taking into account at the very least, this time frame.</p>



SMES DIGITAL STAGE	NEEDS	RESOURCES TO MEET THE NEEDS DETECTED	POTENTIAL MEASURES AND PROGRAMMES FROM THE PUBLIC ADMINISTRATION
TRANSPARENCY	<p>Connectivity and interoperability between IT and OT technologies along the whole supply chain (Total Management Systems). The technologies that should be promoted in the agri-food sector at this stage are:</p> <ul style="list-style-type: none"> - Cybersecurity. - Coaching Kata & Improvement Kata - Want To Be Condition - Digital Workstation (paperless) - ERP / CRM - MES (Manufacturing Execution Systems) y SCADAs - WMS (Warehouse Management Systems) - IIOT, RFID... - AGVs - Design / Thinking - Knowledge Management Systems - Agile methodologies (SCRUM) 	<ul style="list-style-type: none"> - Training on cybersecurity at first stage, since the capacity of components of the production plan to connect, communicate and operate together could involve high risk due to incorrect handling. (From sub-optimal performance to loss of confidential data). - Training on enabling and facilitating technologies, since their strength is based not in their individual characteristics but in their capacity to be combined. <p>Investment:</p> <ul style="list-style-type: none"> - Investment in emerging technologies and innovation and R & D projects to adapt these technologies to the production environment. - Investment in the deployment of high-speed connections, equipment and radio-links in rural areas <p>the different digital solutions and emerging technologies will be linked simultaneously in the operations model with a vision of value contribution (user-center vs. Technology-push approach)</p>	<ul style="list-style-type: none"> - Training and awareness programmes in cybersecurity. - Setting up standards and certification systems to cybersecurity entities, in order to facilitate the identification of appropriate suppliers by agri-food SMEs. - Public investment and coordination with the telecommunication sector to promote the quick deployment of high-speed connections in rural areas. This is a paramount aspect since the point of view of the agri-food sector, since the most of its companies are located in rural areas and they need quality internet connection to get success in the implementation of digital technologies. - Public programmes to support R&D&innovation projects focused on the adaptation of the digital technologies to the productive processes of the agri-food sector.



SMES DIGITAL STAGE	NEEDS	RESOURCES TO MEET THE NEEDS DETECTED	POTENTIAL MEASURES AND PROGRAMMES FROM THE PUBLIC ADMINISTRATION
INTERACTION	<p>During this stage companies should work to create a digital replication of the organization processes by applying virtualization technologies (digital twin). It will help to a better understanding of the variables and factors affecting a process, and to produce new Knowledge that support the complex and fast decision making based in large amount of data. The technologies that should be implemented are:</p> <ul style="list-style-type: none"> - Digital twin - Cyber-physical Systems (CPS) - SERP (Smart Enterprise Resource Planning) - Business Intelligence (BI) - Six Sigma - Advanced Statistical Process Control - Artificial vision - Augmented reality - Co-bots 	<p>-Training and attraction of talent in data scientists.</p> <p>-Investment: implementation projects in business intelligence technologies, sensorics, artificial vision...</p>	<p>- Training programmes in business intelligence and cyber physical systems.</p> <p>- Public collaboration with the high education system to promote the development of new profiles focused on digital skills.</p> <p>- Public programmes to promote benchmarking actions and cross sectorial collaboration projects.</p> <p>-Public programmes to promote private investment in implementation projects focus on cyber-physical technologies.</p>



SMES DIGITAL STAGE	NEEDS	RESOURCES TO MEET THE NEEDS DETECTED	POTENTIAL MEASURES AND PROGRAMMES FROM THE PUBLIC ADMINISTRATION
INTELLIGENCE	<p>In this stage, agri-food companies are able to simulate different future scenarios and to identify more likely ones. It involves projecting the digital twin developed in the previous stage to the future, in order to represents a wide variety of possibilities and evaluate them in terms of probability to be able to anticipate events and un wanted situations on time. The technologies that should be implemented during the intelligence phase are:</p> <ul style="list-style-type: none"> - Big data - IA / Machine learning - Predictive Maintenance (PdM) - Blockchain (Trazability) 	<p>Training in emerging technologies: big data, machine learning...</p> <p>Training in innovation.</p> <p>Programmes to support projects in emerging technologies.</p>	<p>-Promote training programmes in emerging technologies</p> <p>- Public collaboration with the high education system to development master and post-university degrees in emerging technologies.</p> <p>-</p> <p>-Public programmes to promote private investment in implementation projects focus on emerging technologies.</p>
ADAPTABILITY	<p>Decentralization allows different systems within the smart factory to use digital twin data for autonomously making decisions (without human help), in order to adapt the process to a changing business environment as quickly as possible without deviating from the ultimate organizational objective. the technologies that should be implemented at the adaptability stage are:</p> <ul style="list-style-type: none"> - Self-driving vehicles (SDVs) - RPAs: Robot process automation - Autonomous maintenance - IA to facilitate the decision making 	<p>Investment in R&D projects to test disruptive technologies: autonomous maintenance...</p>	<p>- Public programmes to promote staff exchange and to attract external specialized talent.</p> <p>- Public programmes to support R&D projects in disruptive technologies (great added value, but great risk of performance)</p>

Part V. Commitment

This Action Plan has been developed by ICE – Institute for Business Competitiveness of Castilla y León, who commit themselves implement the actions envisioned within their respective capabilities

Date: 09 th of October 2019
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Name of the organisation(s): ICE – Institute for Business Competitiveness of Castilla y León

Signatures of the relevant organisation(s):

**Beatriz Casado Sáenz,
Director of the Innovation & Entrepreneurship Department,
Institute for Business Competitiveness of Castilla y León.**