



RESEARCH AND INNOVATION STRATEGY FOR SMART SPECIALISATION (RIS3) OF CASTILLA Y LEÓN 2021-2027



**Junta de
Castilla y León**



**RESEARCH AND INNOVATION STRATEGY
FOR SMART SPECIALISATION (RIS3) OF
CASTILLA Y LEÓN 2021-2027**

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Introduction

The Research and Innovation Strategy for Smart Specialisation (RIS3) of Castilla y León for the period 2021-2027 builds on the progress achieved in the RIS3 2014-2020 and is a step further towards the economic transformation of our economy and our society. For this new period, this transformation faces the challenges of the digital transition and ecological transition and also the need to make Castilla y León competitive, sustainable and resilient (with organisations and structures capable of withstanding critical situations).

The RIS3 2021-2027 is a finalist strategy, as it seeks to achieve results at both economic and social levels, but it is also an open and evolving strategy, as it includes mechanisms to implement a continuous process of discovery of business opportunities, based on participatory governance. This process will allow our Community to adapt to, and even anticipate, opportunities which, by taking advantage of scientific and technological changes, will contribute to a better development of the shared vision on which the strategy is based.

The strategy is approached from a twofold perspective: on the one hand, to meet internal

demands that can benefit from the application of science, technology and innovation. On the other hand, maintaining the international vision that takes advantage of the capacities of our community to generate competitive and comparative advantages abroad.

In its deployment, the strategy is the initial planning element for R&D&I and Information Society policies, setting out the guidelines with which the different sectoral or horizontal plans and programmes, developed within the scope of their competences by the different management centres of the Regional Government of Castilla y León, must be aligned in the 2021-2027 period.

At the same time, as a planning element, the strategy is coherent with other elements of policy planning in the Community, and considers the existing commitment in Castilla y León to the achievement of the Sustainable Development Goals of the 2030 Agenda, the integration of gender perspective in the design and implementation of actions, the participation of social and economic agents in the design and evaluation of public policies, and evaluation as a central element of planning and transparency in strategic management.

Finally, it is worth mentioning that the RIS3 2021-2027 is being developed in accordan-

ce with the approaches of the IV Framework Agreement for Competitiveness and Business Innovation of Castilla y León. The Framework Agreement establishes the guidelines for the Community's enterprise policy for the coming years, with the RIS3 2021-2027 being the planning instrument for R&D&I and digitalisation policies. Specifically, the RIS3 contains the planning of the actions of the areas of Digitalisation, Science and Innovation, Financing, Efficient public management (with regard to digital administration), Internationalisation (with regard to participation in projects of common European interest), Business environment (concerning infrastructures supporting R&I and digitalisation), Rural environment and endogenous resources (concerning innovation and economic diversification in rural areas), Transition to a circular economy and Human capital and training (linked to human capital for R&I, STEM vocations and digital skills). ●

RIS3 is the planning element of the Community's R&D&I and Information Society policies for the 2021-2027 period





Diagnosis



1.1 Background

Castilla y León was a pioneer among European territories in the formulation of strategies linked to technology and innovation, with the launch of the Regional Technological Plan in 1997. Since then, our Community has consolidated its own science and technology system, thanks to the development of infrastructures, a legal framework, a supportive institutional architecture in the Regional Government of Castilla y León and various planning elements, including the latest RIS3 2014-2020.

Thus, Castilla y León has a long history of participatory strategic planning in R&D&I and Information Society. This planning has been integrated in the different Framework Agreements for Industrial Competitiveness and Innovation, since 2006, the main reference for the economic, social and territorial development of the Community, agreed by the Public Administration of the Community and the main economic and social agents.

This path for consolidation of the science and technology system in Castilla y León has had some outstanding milestones such as the implementation of technology and science parks, the

network of technological centres, the network of knowledge transfer offices in universities, the network of incubators and accelerators, the creation and consolidation of innovative business clusters, the development of research institutes linked to the universities and/or the CSIC, the implementation of Singular Scientific and Technical Infrastructures (ICTS) of a national nature in the region, and the existence of a Biomedical Research Institute (IBSAL) in Salamanca accredited by the Carlos III Health Institute.

The RIS3 of Castilla y León 2014-2020 was defined with the idea of having an operational instrument that would make it possible to develop innovations at European level based on the prioritisation of regional capacities, i.e. a series of economic, technological and knowledge areas as potential sources of competitive advantages on which to focus efforts.

After the first three years of implementation, a mid-term evaluation was carried out and it was considered appropriate to update it for the period 2018-2020, a document that is in force until the entry into force of the RIS3 2021-2027, and whose final evaluation is pending. ●



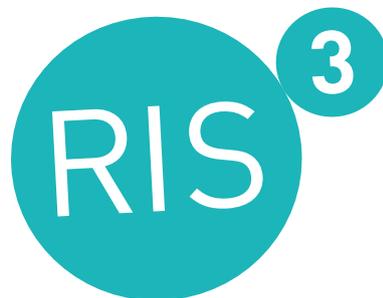
1.2 Smart specialisation

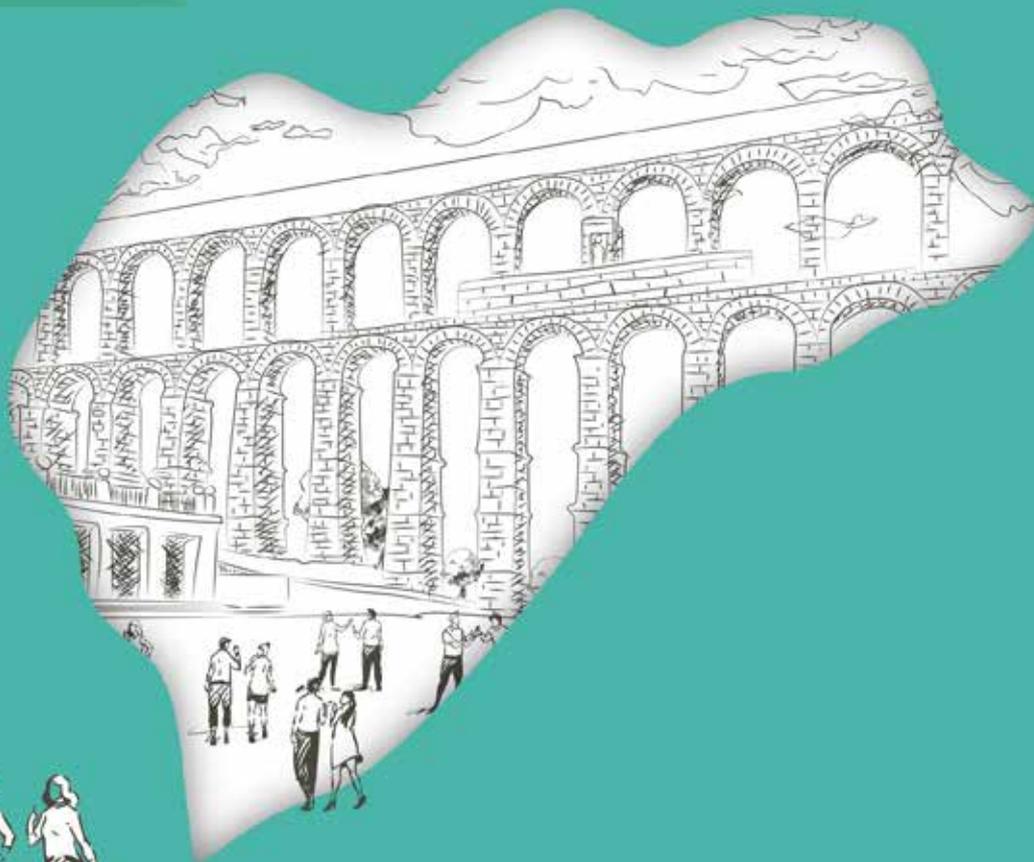
RIS3 are agendas for economic transformation based on research and innovation, defining priorities to generate competitive advantages that take advantage of business opportunities and market developments while avoiding duplication and fragmentation of efforts. Their definition therefore requires the participation of companies, universities, research and innovation centres, technology centres, training centres, public administrations and society in general.

The Smart Specialisation Strategies (RIS3) were a new approach to EU regional policy in the 2014-2020 period, being a prerequisite for the approval of the European Regional Development Fund (ERDF) operational programmes.

One of the novelties introduced by the 2021-2027 cohesion policy regulations is the enabling conditions for the implementation of these funds, which must be maintained throughout the programming period. Some directly affect RIS3, such as the need to maintain a continuous participatory process of business opportunity discovery, and to address industrial transition and international collaboration. ●

The RIS3 are agendas for economic transformation based on research and innovation...





1.3 Context

The new Research and Innovation Strategy for Smart Specialisation in Castilla y León 2021-2027 has been drawn up in a context marked by the so-called ecological and industrial transitions. At the same time, progress is being made towards a knowledge-based society that addresses social challenges linked to health, the demographic challenge and equality, both in terms of rights and opportunities.

The RIS3 2021-2027 has been defined in a context clearly influenced by the impact and crisis generated by the Covid-19 pandemic, which, in addition to the health crisis, has led to a socio-economic crisis at global level. Alongside the goal of competitiveness, it is now necessary to build an economy and society that are resilient to future threats.

In addition, our Community is committed to contributing to the UN 2030 Agenda for Sustainable Development. The RIS3 2021-2027 of Castilla y León will contribute more prominently to the following Sustainable Development Goals:



1.3.1 European strategic context

The main European R&I programme is the *Horizon Europe*¹ Framework Programme, which is structured in three pillars: Excellent Science; Global Challenges and European Industrial Competitiveness; and Innovative Europe. The Framework Programme will support excellence in research as well as the competitiveness of the Community's enterprises by funding top-level R&D&I linked to smart specialisation, as well as facilitating the visibility of the Community's R&D&I and the collaboration and exchange of knowledge with other European regions.

One of the coordination mechanisms of Horizon Europe will be the so-called R&I Missions, to respond to existing challenges. Of particular interest to Castilla y León are the Cancer, Soil Health and Food missions, Adaptation to Climate Change and Smart and Climate Neutral Cities. In addition to the R&I Missions, in the Global Challenges and European Industrial Competitiveness Pillar, the so-called *Clusters* will also be a reference for the Community's R&I, especially those linked to Health, Digital World, Industry and Space, Climate, Energy and Mobility and the

Food, Bioeconomy, Natural Resources, Agriculture and Environment *Cluster*.

Also relevant for RIS3 2021-2027 are the approaches of the *Industrial Strategy for Europe 2030*², which is committed to the technological leadership and sustainability of European industry, due to boosting strategic value chains and creating a competitive ecosystem at European level. It also includes the anticipation and development of skills that facilitate the generation and dissemination of knowledge, together with the promotion of strategic innovations.

The context for the Castilla y León Digital Agenda is set by the *Digital Compass 2030: Europe's way forward for the digital decade*³. This European Commission roadmap identifies four areas for action: secure and sustainable digital infrastructures, the digital transformation of businesses, the digitalisation of public services and skills. One of the identifying aspects of this strategy is the commitment to multi-country projects, combining public-private investment.

1 Horizon Europe Programme : <https://www.consilium.europa.eu/es/policies/horizon-europe/>

2 Industrial Strategy for Europe: https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-industrial-strategy_es#documents

3 Digital Compass 2030: https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_es

The *Digital Europe Programme 2021-2027*⁴ completes the European context for the Castilla y León Digital Agenda, focusing on strategic skills in five areas: supercomputing, artificial intelligence, cybersecurity, advanced digital skills and the widespread use of advanced technologies in the economy and society.

The *Digital Education Action Plan 2021-2027*⁵ sets the European context for digital skills, with two priorities: driving the development of a high-performing digital education ecosystem and enhancing digital competences and skills for digital transformation.

The context of economic and social policy development is also marked by the *European Green Pact*⁶, which aims to guide Europe towards meeting various sustainable objectives, such as the efficient use of resources and the reduction of net greenhouse gas emissions by 2050. The Green Pact is committed to economic growth that is compatible with the protection of Europe's natural capital and the health and well-being of its citizens. Its measures aim at a higher level of EU climate ambition for 2030 and 2050, moving towards

a clean and circular economy, energy and resource efficiency in the construction and renovation of buildings and accelerating the transition to sustainable and smart mobility. The Green Pact is complemented by other more sectoral strategies, such as the European Commission's *Climate and Energy 2030*⁷ strategy and the *Circular Economy Action Plan*⁸.

On the other hand, and as a result of the economic and financial crisis, as well as the health and social consequences, generated by the Covid-19 pandemic, the European Commission has approved the *Next Generation EU*⁹ Programme. This programme aims to support the exit from the crisis by transforming the economy to make it more sustainable and resilient through the modernisation of traditional policies, as well as by addressing and developing the green and digital transitions, both economically and socially. To this end, it is counting on additional funds to those traditionally provided by Europe and which represent a financial injection for the regions, which should positively support their smart specialisation.

4 Digital Europe Programme 2021-2027:

<https://www.consilium.europa.eu/es/press/press-releases/2021/03/16/digital-europe-programme-gets-green-light-from-council/>

5 Digital Education Action Plan 2021-2027: https://ec.europa.eu/education/education-in-the-eu/digital-education-action-plan_es

6 European Green Pact-Green Deal: https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0004.02/DOC_1&format=PDF

7 Energy and Climate Framework 2030: https://ec.europa.eu/clima/policies/strategies/2030_es

8 Action Plan for the Circular Economy: https://ec.europa.eu/commission/presscorner/detail/es/ip_20_420

9 NEXT GENERATION EU Programme: https://ec.europa.eu/info/strategy/recovery-plan-europe_es

1.3.2 State strategic context

In the specific framework for the formulation of RIS3 2021-2027 for Castilla y León, the main reference frameworks are the *Spanish Strategy for Science, Technology and Innovation 2021-2027*¹⁰, the *Strategy Spain Entrepreneurial Nation*¹¹ and the *Digital Spain Plan 2025*¹², to whose objectives they contribute:

- ✧ National Digital Skills Plan.
- ✧ Public Administration Digitalisation Plan.
- ✧ SME Digitalisation Plan.
- ✧ Plan for Connectivity and Digital Infrastructures.
- ✧ 5G Technology Promotion Strategy.
- ✧ National Artificial Intelligence Strategy.

Linked to the *Next Generation EU* Programme, Spain has a *Recovery, Transformation and*

Resilience Plan (“España Puede” (Spain Can))¹³. The Plan is structured along four main lines: 1) Green Spain; 2) Digital Spain; 3) Spain without gender gaps; 4) Cohesive and inclusive Spain.

In the field of digitalisation, the objectives of the *Connected Industry 4.0 Strategy*¹⁴ are to increase industrial added value and skilled employment in the industrial sector; to favour the industrial model of the future, increasing the growth potential of Spanish industrial sectors and the development of the local supply of digital solutions; and the development of competitive levers that help to favour Spanish industry.

The sustainability dimension is part of the *Fair Transition Strategy*¹⁵. The main objective is to maximise employment opportunities and minimise the impacts of the energy transition.

¹⁰ Spanish Strategy for Science, Technology and Innovation 2021-2027: <https://www.ciencia.gob.es/site-web/Estrategias-y-Planes/Estrategias/Estrategia-Espanola-de-Ciencia-Tecnologia-e-Innovacion-2021-2027.html>

¹¹ Strategy Spain as an entrepreneurial nation: https://www.lamoncloa.gob.es/presidente/actividades/Documents/2021/110221-Estrategia_Espana_Nacion_Emprendedora.pdf

¹² PDigital Spain 2025 Plan: https://portal.mineco.gob.es/ca-es/ministerio/estrategias/Paginas/00_Espana_Digital_2025.aspx

¹³ “España Puede” Recovery, Transformation and Resilience Plan: <https://www.lamoncloa.gob.es/temas/fondos-recuperacion/Paginas/plan-de-recuperacion.aspx>

¹⁴ Connected Industry 4.0 Strategy: <https://www.industriaconectada40.gob.es/programas-apoyo/Paginas/programas.aspx>

¹⁵ Fair Transition Strategy : <https://www.miteco.gob.es/es/prensa/ultimas-noticias/la-estrategia-de-transici%C3%B3n-justa-ser%C3%A1-el-marco-de-actuaci%C3%B3n-para-optimizar-las-opportunidades-de-la-transici%C3%B3n-ecol%C3%B3gica-/tcm:30-487299>

1.3.3 Strategic context of the community

This strategy is complemented by the *Mine Restoration Plan* and the *Renewable Energy and Energy Efficiency Plan*.

The *Spanish Climate Change and Clean Energy Strategy*¹⁶, which aims to comply with the measures established for Spain in terms of climate change and the promotion of clean energies, and the *Spanish Circular Economy Strategy*¹⁷ (EEEC) (España Circular 2030).

The State's strategic framework for sustainability is complemented by the *National Integrated Energy and Climate Plan (PNIEC) 2021-2030*¹⁸, which aims for a 23% reduction in greenhouse gas emissions compared to 1990; and the *National Strategy for Green Infrastructure and Ecological Connectivity and Restoration*¹⁹.

The main reference framework for RIS3 is the IV Framework Agreement for Business Competitiveness in Castilla y León. The Framework Agreement establishes the guidelines for the Community's enterprise policy for the coming years, with the RIS3 2021-2027 being the planning instrument for R&D&I and digitalisation policies.

At the same time, the RIS3 establishes the orientation of R&D&I and digitalisation actions in sectoral and horizontal plans and strategies for the competitive development of Castilla y León, including the Strategy for Entrepreneurship, Innovation and the Self-Employed, the Master Plan for Industrial Promotion 2021-2025; the General Plan for Vocational Training; the Sectoral Plan for the Habitat of Castilla y León; the Circular Economy Strategy of Castilla y León (2021-2030) or the V Business Internationalisation Plan, among others.

Finally, mention should be made of the Recovery and Resilience Initiatives of Castilla y León²⁰, which should contribute to tackling structural changes in the economy, and to advancing in the challenges of digitalisation and sustainable energy transformation. ●

¹⁶ Spanish Climate Change and Clean Energy Strategy: https://www.miteco.gob.es/es/cambio-climatico/legislacion/documentacion/est_cc_energ_limp_tcm30-178762.pdf.

¹⁷ Spanish Circular Economy Strategy (Circular Spain 2030): <https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/economia-circular/estrategia/>

¹⁸ National Integrated Energy and Climate Plan: <https://www.miteco.gob.es/es/prensa/pniec.aspx>

¹⁹ National Strategy for Green Infrastructure and Ecological Connectivity and Restoration: <https://www.boe.es/boe/dias/2021/07/13/pdfs/BOE-A-2021-11614.pdf>

²⁰ <https://economia.jcyl.es/web/jcyl/Economia/es/Plantilla100Detalle/1284250105595/Programa/1284991970539/Comunicacion>



1.4 Methodology for definition the RIS3 Participatory approach

The process of defining the RIS3 2021-2027 has followed the methodology of the European Commission, already used in the 2014-2020 period, reinforcing the participation of the agents of the so-called quadruple helix of innovation (companies, R&I centres, Administration and society). As the main novelty, RIS3 initiates a continuous process of discovery of business opportunities, also known as the Entrepreneurial Discovery Process (hereafter EDP).

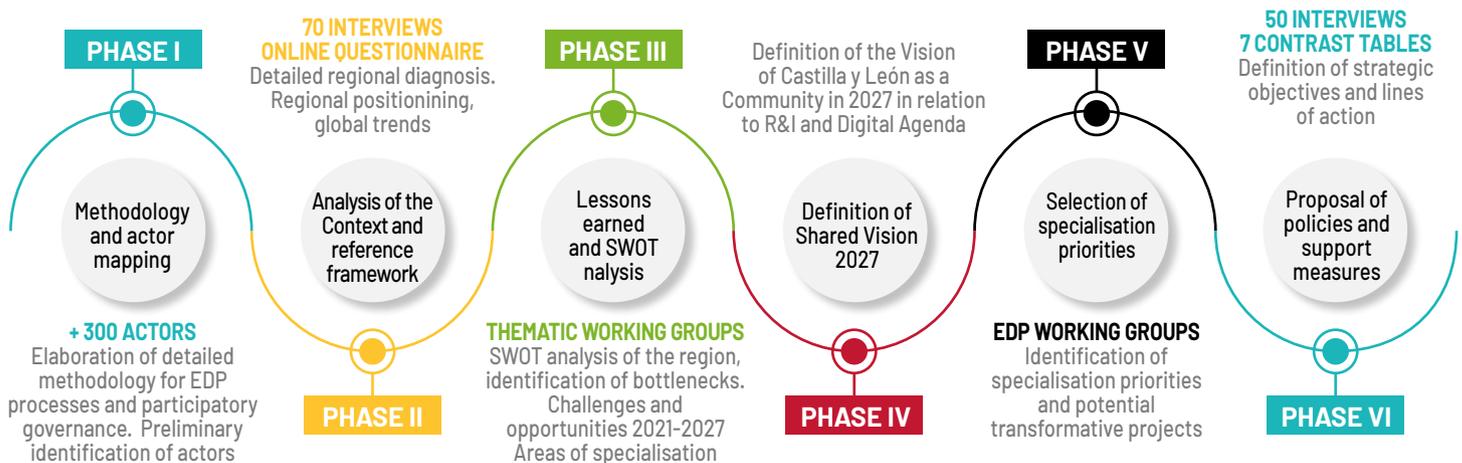
The first phase of the work consisted in the preparation of the EDP methodology and a mapping of

public and private agents in the Community, with a view to their participation in both the process of definition and subsequent implementation of the RIS3.

The second phase of the work consisted of an analysis and diagnosis of the initial situation of Castilla y León in terms of R&I and digitalisation. In addition to the bibliographic, statistical and documentary analysis, in-depth interviews were carried out with various agents, as well as an *online* survey of companies in the Community. National and European reference frameworks were reviewed, as well as technological, scientific and market trends.

CHART 1. WORK PHASES OF THE PREPARATION OF THE RIS3 2021-2027

Source: Own compilation.



The third phase identified the challenges for innovation dissemination, the SWOT analysis ²¹ and the lessons learned from the previous period. In this phase of the work, the implementation of the plans, programmes and strategies of the Regional Government of Castilla y León was reviewed and different thematic working groups were organised, with the participation of companies, knowledge-generating agents (universities, technology centres and research centres), representatives of society and the public administration of the Community.

The roundtables were organised on the basis of the sectoral areas of the economic specialisation pattern: agri-food, transport and mobility; health and social care; advanced technologies and cybersecurity; energy and environment; tourism and heritage; and habitat (considering in this last area endogenous forestry and mining resources, as well as construction).

This work contributed to the definition of the Shared Vision of Castilla y León in the year 2027 in terms of R&I and the Digital Agenda, constituting the fourth phase of the work.

The fifth phase of the work consisted of the identification, selection and preparation of the contents of the specialisation priorities of Castilla y León, together with the initial identi-

fication of some potential challenges of a transformational nature that could, a priori, reflect the Community's niches of opportunity. For this identification, and prior to the organisation of the EDP roundtables, surveys were carried out in relation to the work themes.

In the sixth phase of the work, the objectives, lines of action, programmes and instruments that make up the RIS3 were defined, which in turn were also contrasted with all the agents of the quadruple helix of innovation through in-depth interviews and roundtables.

The chart below shows the summary of the participatory process developed for the preparation of the RIS3 of Castilla y León 2021-2027. In total, the RIS3 preparation process mobilised 550 people (32% women), with a continuous participation of 252 companies at the roundtables and 280 through the online questionnaire. ●

21 Analysis of strengths, weaknesses, opportunities and threats.

CHART 2. PARTICIPATORY PROCESS IN THE DEFINITION OF THE RIS3 2021-2027

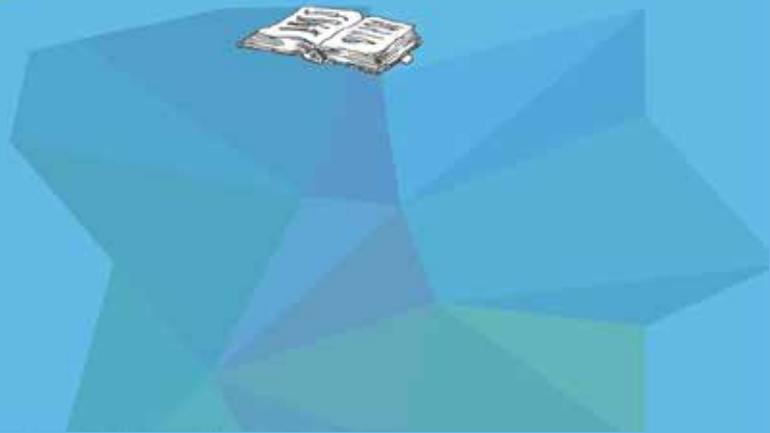
TECHNICAL MANAGEMENT GROUP (Phase II)		
THEME	PARTICIPANTS	NUMBER
RIS3 2021-2027 preparation context	Members of RIS3 Technical Management Group	38
R&I		18
Digitalisation of public services		18
Capabilities and skills for specialisation and entrepreneurship		17
Business Competitiveness		15
Internationalisation		10
Key trends and technologies		17

THEMATIC TABLES (Phase III)		
THEME	PARTICIPANTS	NUMBER
Agri-food	Quadruple Helix Innovation Actors	66
Transport and mobility		47
Health and Social Care		66
Advanced technologies and cyber-security		86
Energy and Environment		76
Tourism and heritage		52
Habitat: endogenous resources and construction		53

ENTREPRENEUR DISCOVERY TABLES (Phase V)		
THEME	PARTICIPANTS	NUMBER
Agri-food	Quadruple Helix Innovation Actors	58
Transport and mobility		41
Health and Social Care		75
Advanced technologies and cyber-security		89
Energy and Environment		79
Tourism and heritage		47
Habitat: endogenous resources and construction		46

CONTRAST TABLES (Phase VI)		
THEME	PARTICIPANTS	NUMBER
Priority 1. Castilla y León, a territory with quality of life	Business and Society	18
Priority 2. Castilla y León, carbon-neutral and fully circular		18
Priority 3. Castilla y León, a commitment to smart manufacturing and cybersecurity		22
Digital Agenda	External national experts	18
RIS3 21-27: actors' role	Technology and research centres, clusters, hubs, universities, etc	33
Main lines of action, programmes and instruments	Members of RIS3 Technical Management Group	25
Governance and Indicators		22

IN-DEPTH INTERVIEWS WITH ACTORS IN THE QUADRUPLE HELIX OF INNOVATION	
THEME	NUMBER
Interviews Phases II and III	70
Interviews Phases V and VI	50



1.5 Analysis of the baseline situation of Castilla y León

1.5.1 Socio-economic analysis

Castilla y León has a total of 2,248 municipalities²² (20% of the total number of municipalities in Spain), distributed over an area of more than 94,000 km², mostly rural and with a population density of 25.42 inhabitants/km², making it one of the largest regions in Europe and with a high geographical dispersion. These characteristics determine economic and social aspects of the Community.

Table 1 shows the main socio-economic indicators for Castilla y León over the last ten years. The year 2020 already reflects the impact of the crisis generated by Covid-19, such as the employed population, the number of companies or the decrease in the volume of exports.

²² Source: DG Budget and Statistics of the Regional Government of Castilla y León with data from the INE.
<https://conocecastillayleon.jcyl.es/web/es/geografia-poblacion/poblacion.html>

TABLE 1. MAIN SOCIO-ECONOMIC INDICATORS FOR CASTILLA Y LEÓN

Source: Prepared by the authors on the basis of data from the INE and DG Budget and Statistics of the Regional Government of Castilla y León.

VARIABLES	2010	2013	2016	2018	2019	2020
POPULATION (thousands of people)	2,558,463	2,494,790	2,425,801	2,399,548	2,394,918	2,381,281 ^A
EMPLOYMENT						
Activity rate	55.1%	54.9%	54.9%	54.49%	55.33%	54.21%
Unemployment rate	15.8%	21.7%	14.8%	11.21%	11.20%	11.61%
Working population (thousands of people)	1,006.4	909.0	972.9	990.8	1,003.9	976.6 ^B
Agriculture, Livestock, Forestry and Fisheries	6.6%	7.3%	7.0%	6.45%	6.11%	6.07%
Industry	15.4%	15.6%	17.2%	18.12%	17.85%	16.62%
Construction	9.1%	6.7%	6.7%	6.55%	6.72%	7.68%
Services	68.9%	70.4%	69.0%	68.86%	69.31%	69.63%
ECONOMY (million euros)						
GDP at market prices	5,8781,747	55,992,203	59,015,294	63,295,138	64,995,340	n.d.
GVA in agriculture, livestock and fisheries	2202377	2,239,551	2,338,947	2,938,297	2,840,458	n.d.
GVA industrial branches	10924640	10,446,157	11,027,197	11,773,606	11,822,755	n.d.
Energy branches	1680270	1,595,398	1,196,984	1,156,945	968,769	n.d.
Manufacturing branches	9,244,370	8,850,759	9,830,212	10,616,661	10,853,986	n.d.
GVA construction branches	5,356,911	3,335,438	3,446,665	3,538,249	3,654,558	n.d.
GVA services branches	34,935,366	34,667,597	36,465,975	38,997,588	40,469,565	n.d.
Market services	26,186,096	26,798,028	28,251,539	30,516,258	31,643,034	n.d.
Non-market services	8,749,271	7,869,569	8,214,435	8,481,330	8,826,531	n.d.
TOTAL GVA at basic prices	53,419,295	50,688,743	53,278,783	57,247,740	58,787,336	n.d.
Net taxes on products	5,362,453	5,303,460	5,736,511	2,938,297	2,840,458	n.d.
BUSINESSES						
Active companies (No.)	168,972	162,153	161,364	161,986	161,407	160,199
TRADE						
Imports (million euros)	9,017.7	10,780.7	12,703.6	13,216.0	12,276.9	10,020.80
Exports (million euros)	10,400.6	12,592.7	16,329.2	16,437.9	15,804.3	13,442.48
External balance (million euros)	1,382.9	1,812.0	3,625.6	3,221.9	3,527.4	3,421.68
Coverage rate	115,34%	116,81%	128,54%	124,38%	128,73%	134,15%

A On 1 January 2021.

B Following the guidelines of the International Labour Organisation and EUROSTAT, workers affected by ERTes are classified as employed.

Castilla y León had 2,381,281 inhabitants in 2020, following a trend of population loss over the last few years. The average age was 47.10 years in 2019, making our Community one of the most ageing in Spain. According to INE projections, in Castilla y León by 2033, people over 65 years of age will account for 33.5% of the population (733,674) and octogenarians will account for 25% of the total elderly population.

In 2020, the employed population reached a total of 976.6 thousand people, with an activity rate of 54.21% (lower than the average activity rate in Spain of 58.19%) and an unemployment rate of 11.61% (lower than the Spanish average of 16.13%), which, although it has been decreasing since 2013, has increased slightly with the pandemic.

In terms of employment by economic sector, over the last 10 years, the service sector is the sector with the highest number of employed persons with 69.6% of the total number of employed persons in 2020. It is followed by industry with a share of 16.62% in 2020. This is followed by construction with 7.68% and with a slightly lower weight, agriculture with 6.07%.

In relation to the GDP at market prices of Castilla y León in 2019, it reached the figure of 64,995,340 thousand euros, representing 5.22%

of the national GDP, with a similar percentage to the population weight, standing at 5.05%. In terms of growth, Castilla y León's GDP has shown a year-on-year growth of 3.10% in 2019 compared to 2018, higher than the national year-on-year growth of 2%.

Exports of goods from Castilla y León in 2020²³ have reached 13,442.48 million euros. The Community has followed the growth trend until 2019, with the impact of the pandemic on this indicator being felt in the last two years. Imports, on the other hand, reached 10,020.8 million euros. In any case, the external balance continues to be positive for Castilla y León. The Community represents 5.15% of total Spanish exports, which is also similar to the weight of the population and the weight of the regional GDP in the national total. Following the nomenclature of TARIC groupings, the main products exported by Castilla y León are Transport Material (39.46% of the Community's total exports), Non-electrical Machinery (15.09%) and Agricultural products (14.64%).

Exports of high-tech goods²⁴ have reached 9,499 million euros. As for their evolution, despite the increase in the 2008-2016 period (except 2012), they show a decreasing trend over the last 3 years. In monetary terms, they have been reduced from 11,549 million euros in 2016 to 9,499 million euros in 2019, a 17.8% decrease.

²³ Source: DG on the Regional Government of Castilla y León.

²⁴ Source: INE.

1.5.2 Situation of R&I and digitalisation

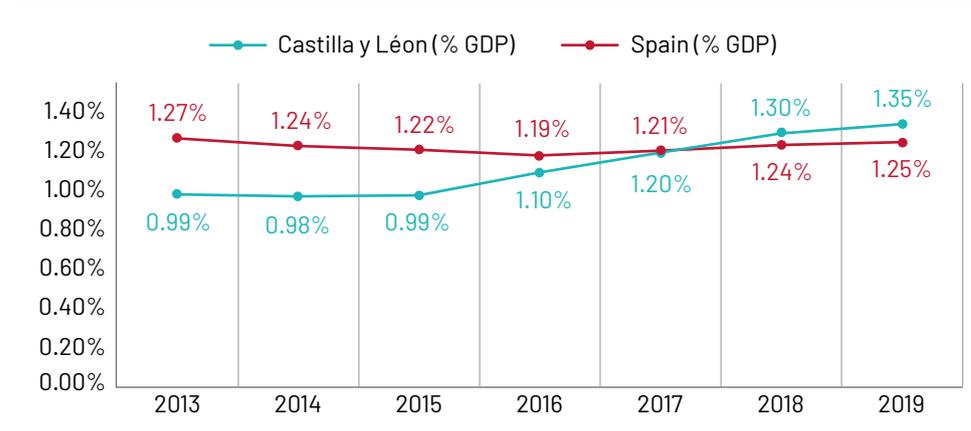
Research and Innovation in Castilla y León

The data on total R&D expenditure as a percentage of GDP places Castilla y León above the average for Spain as a whole, standing at 1.35% in 2019, compared to 1.25% nationally. This indicator has followed an upward trend since 2014.

Although still far from the European targets, these data place Castilla y León in the top Spanish regions, in fifth position, after the Basque Country, Madrid, Navarre and Catalonia.

CHART 3. R&D EXPENDITURE/GDP (2013-2019)

Source: Own compilation from the DG Budget and Statistics of the Regional Government of Castilla y León with data from the INE.



The business sector accounts for the largest R&D expenditure, accounting for 65.4% of the total in 2019, followed by Higher Education, with 28.3% of total expenditure and, lastly, Pu-

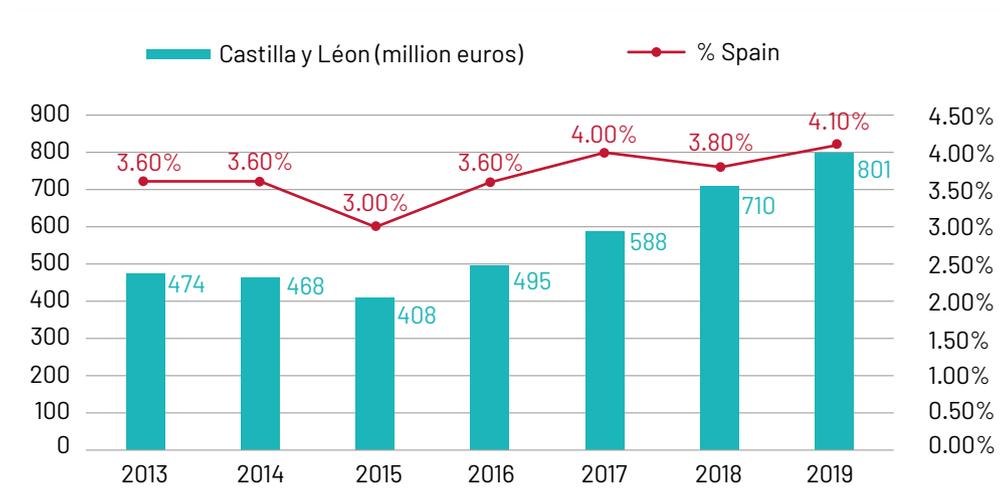
blic Administration, with 6.4%. This is another of the Community's characteristics, with a significant contribution from the business sector and an important contribution from the uni-

versity system. Both contributions are higher than the national average, at 56.1% in the case of businesses and 26.6% in the case of Higher Education.

With regard to expenditure on innovative activities ²⁵, Castilla y León shows a growing trend from 3% in 2015 to 4.10% in 2019, and it the sixth Autonomous Community with the highest expenditure on innovative activities.

CHART 4. EXPENDITURE ON INNOVATIVE ACTIVITIES (MILLION EUROS)(2013-2019)

Source: Own compilation from the DG Budget and Statistics of the Regional Government of Castilla y León with data from the INE and from ICONO (FECYT).



In terms of human resources in R&D, there has been an increase in R&D personnel and research personnel since 2014. The percentage of women has also been increasing, representing 42.6% of R&D personnel and 43.5% of research

personnel in 2019. In both cases, this is above the national average, where women represent 40.6% of the total number of researchers and 39.9% of R&D personnel.

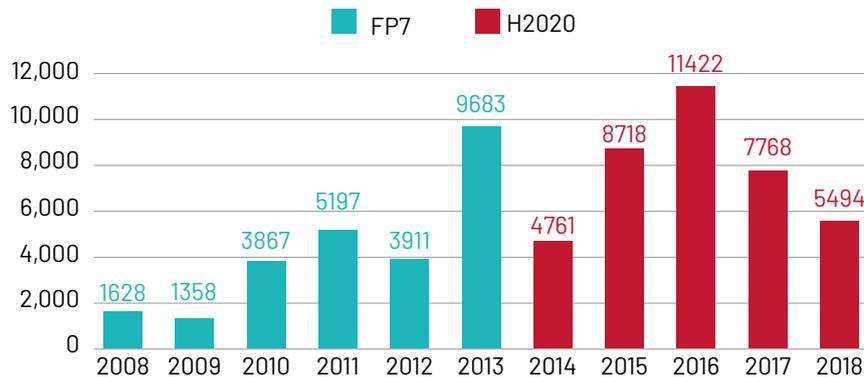
²⁵ Considering the autonomous community where the activities have taken place.

The percentage of R&D personnel in Castilla y León in relation to the national total has remained practically stable at around 4.6% ²⁶. This percentage is slightly lower than Castilla y León's contribution to the national total in socio-economic indicators, as population or GDP.

The rate of return on participation in the EU's Seventh Framework Programme (2007-2013), in

total for the period, Castilla y León has increased from 1,618 euros per thousand inhabitants in 2008 to 9,683 euros in 2013, which represents an increase of 498%. In total, the Community entities obtained 64,968,137 euros. Participation in the first five years of the Horizon 2020 programme (2014-2018) amounted to 93,731,722 euros, higher than in the entire previous programme.

CHART 5. RETURN OF THE PARTICIPATION IN HORIZON 2020
Source. Own compilation based on data from ICONO (FECYT).



In terms of scientific activity, the number of publications indexed in Scopus (through ICONO data ²⁷) decreased in 2019, the last year with available data. However, the indicators referring to publications in high impact journals (Q1), pub-

lications of excellence in 10% and publications in international collaboration were improved. This development is seen as positive, as it implies an increase in quality (global impact of our publications).

²⁶ Source: DG Budget and Statistics of the Regional Government of Castilla y León with data from the INE.

²⁷ Accessible from the ICONO website: <https://services.icono.fecyt.es/indicadores/Paginas/default.aspx?ind=98&idPanel=1>

Innovation Capacity in Castilla y León

One of the keys to be taken into account in order to make progress in smart specialisation is the existing capacity to tackle R&I processes, where the training and education of the population play an important role.

From the point of view of the education of the population, the percentage of adults with tertiary education in Castilla y León has improved during the period 2008-2019. This percentage has risen from 30.2% to 38.4%, an improvement of 8.2%. It is therefore almost at the same level as Spain and above the EU28 level.

In 2019, 10.9% of the population in Castilla y León aged 25-64 years old participated in some kind of lifelong learning activity. In terms of growth, it has declined from 11.2% in 2008 to 10.9%, however, its lowest value was recorded in 2016 at 9.6%. Thus, the Community is above the national average but below the European average.

On the other hand, according to the results of the PISA 2019 Report ²⁸, as an international assessment system for 15-year-old students, Castilla y León is the second Autonomous Com-

munity to obtain a better score in Mathematics (502) and Science (501), after Navarre and Galicia respectively, placing it above the Spanish average (481 in Mathematics and 483 in Science) and above the OECD average (489 in Mathematics and 489 in Science). These good academic results attest to the high level of the Community's education system in R&I-related knowledge.

Taking into account the innovation intensity value ²⁹, in 2019 Castilla y León stood at 1.3, only surpassed by the Basque Country (2.0), Catalonia and Navarre (both with 1.4), in any case above the national average of 1.1.

Despite the relatively high value of innovation intensity in Spain, in terms of regional innovation capacity, according to the RIS 2021 ³⁰, Castilla y León is classified as a "moderate innovator (-)" region, occupying a discrete position among the 240 European regions included in the report. Although the evolution of the index has been positive, the ranking has not improved and is therefore an area where the Community needs to make faster progress.

28 PISA Report (OECD): <https://www.oecd.org/pisa/pisa-en-espanol.htm>

29 Innovation intensity = Expenditure on innovative activities according to head office / turnover x 100.

30 The Regional Innovation Scoreboard (RIS) comprises a total of 27 indicators including the areas of investment in research and innovation, innovative activities and elements related to human resources and employment.

CHART 6. INNOVATION INTENSITY. 2019

Source: Own compilation from the DG Budget and Statistics of the Regional Government of Castilla y León with data from the INE.

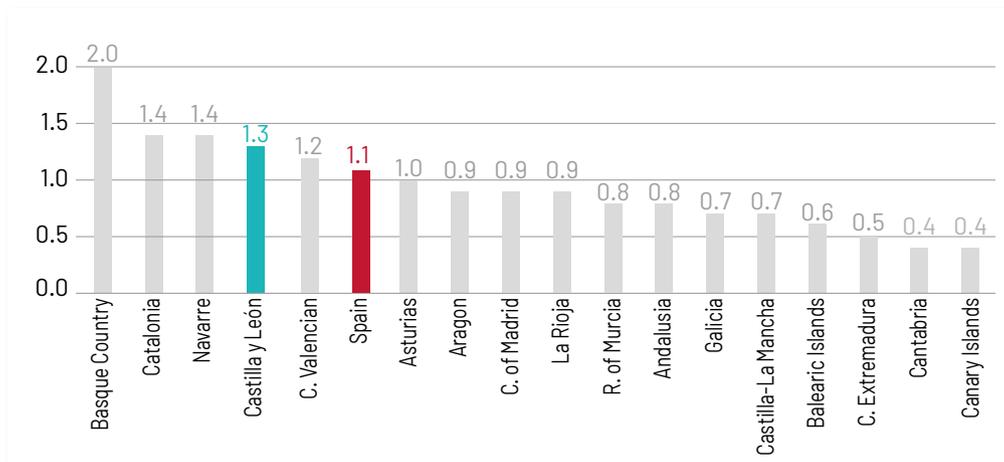
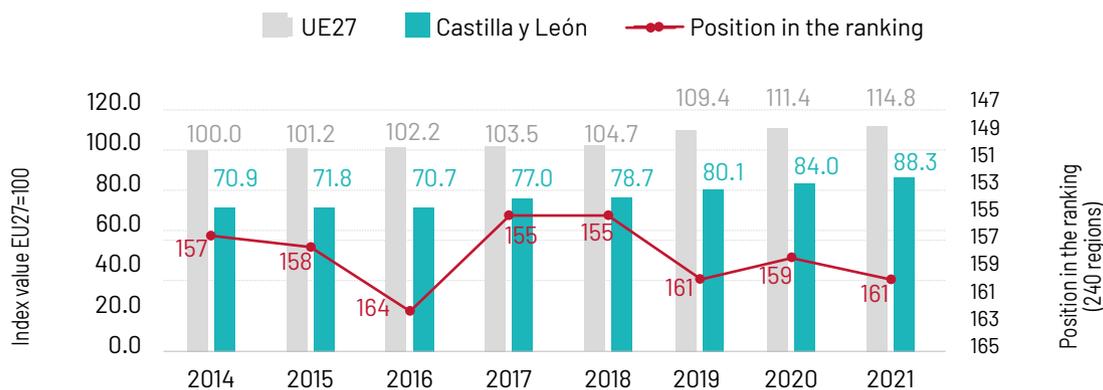


CHART 7. COMPOSITE INNOVATION INDICATOR AND ITS EVOLUTION. POSITIONING OF CASTILLA Y LEÓN IN THE EUROPEAN RANKING OF INNOVATIVE REGIONS

Source: Own compilation based on data from the Regional Innovation Scoreboard platform (Regional Innovation Scoreboard)
https://ec.europa.eu/growth/industry/policy/innovation/regional_en



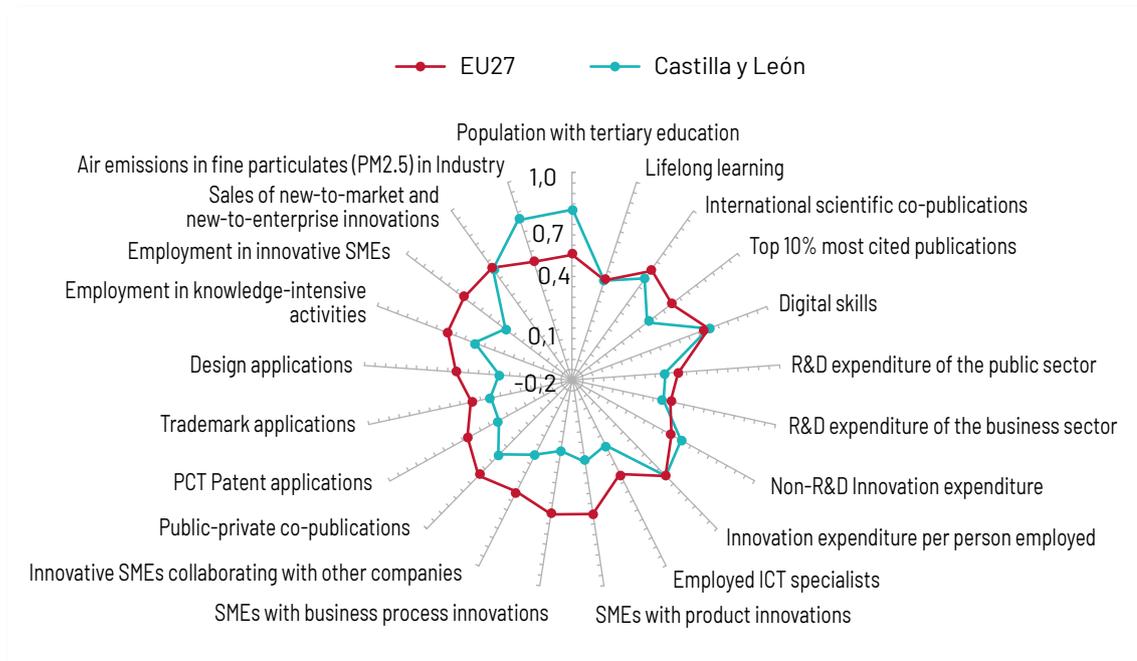
When analysing the components of the composite index, two characteristics stand out in comparison with the EU average:

✧ Castilla y León registers higher values (strengths) in the indicators of population with tertiary education, innovation expenditure other

than R&D and innovation expenditure per employed person.

✧ Castilla y León registers lower values (weaknesses) in several indicators, notably employment in innovative SMEs, employment in knowledge-intensive activities and most cited publications.

CHART 8. REGIONAL INNOVATION INDICATORS 2021 AND THEIR EVOLUTION
 Source: Own compilation based on data from the Regional Innovation Scoreboard platform
https://ec.europa.eu/growth/industry/policy/innovation/regional_en

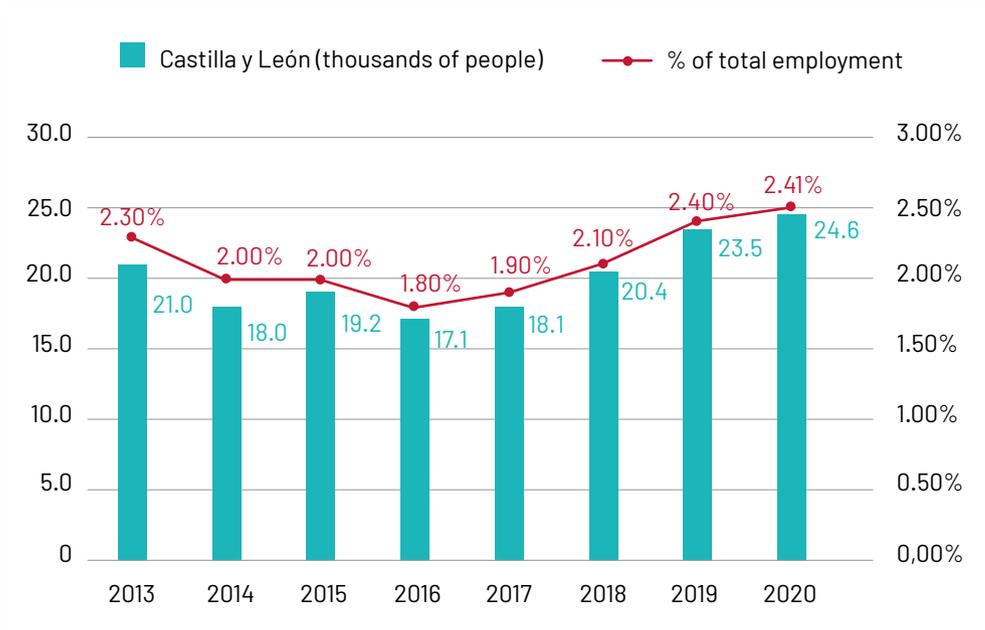


In terms of employment in technology and knowledge-intensive sectors, employment in 2019 stood at 24.6 thousand people in the Community, which is 2.51% of the total number of employees. It can be seen that over the last four

years, the evolution has been consistently positive. Even so, the Community is in seventh place in national terms, behind Madrid (8.1%), Catalonia (5.3%), the Basque Country (4.1%), Asturias (3.5%) and Navarre and Galicia, both with 2.9%.

CHART 9. EMPLOYMENT IN TECHNOLOGY AND KNOWLEDGE-INTENSIVE SECTORS (2013-2020)

Source: Own compilation based on EUROSTAT data.



Digitalisation

INFRASTRUCTURES AND CONNECTIVITY

The size of the Community, its geographical dispersion and the low population density in certain areas make it difficult to deploy telecommunications infrastructures, both physically (geography) and economically (lack of profitability for operators).

According to 2020 data, broadband coverage, both above 30 Mbp and above 100 Mbp, is lower in Castilla y León than the national average.

TABLE 2. SPEED COVERAGE
IN CASTILLA Y LEÓN AND SPAIN. 2020

Source: Own compilation based on Broadband Coverage Report as of May 2021. Secretary of State for Telecommunications and Digital Infrastructure.

	>= 30 MBP.	>= 100 MBP.
CASTILLA Y LEÓN	93.2%	73.8%
SPAIN	95.2%	87.5%

HOUSEHOLDS AND CITIZENS

According to INE statistics, in 2020, 79.4% of households in Castilla y León had a computer, a percentage that has been gradually increasing over the last 10 years but is still slightly below the national average (81.4%). In terms of households with Internet access, 93.9% of households in Castilla y León have broadband. Regarding the use of Internet services, 63.6% of Internet users in Castilla y León use e-banking services, compared to the national average of 66.6%. And 11.1% of Castilla y León inhabitants access personal health records via the Internet, a figure that rises to 18.9% nationally. Likewise, only 33% of the population of the Region request medical appointments via this method (web or mobile app), compared to the national average of 43.2%.

Regarding the digital skills of the population, 38.2% of the population between 16 and 74 years of age in Castilla y León consider that they have an advanced level (compared to 41.1% nationally), 20.3% that they have basic skills (19.1% nationally) and 30.8% that their skills are low (compared to 31.7% nationally).

TABLE 3. DIGITAL SKILLS

Units: Number of persons (16 to 74 years)
and horizontal percentages.

Source: INE. Survey on Equipment and Use of Information and Communication Technologies in Households 2020.

INDICATOR	SPAIN	CASTILLA Y LEÓN
Total	35,238,288	1,740,099
Digital skills: No Skills	1.6	1.7
Digital skills: Low Skills	31.7	30.8
Digital skills: Basic Skills	19.1	20.3
Digital skills: Advanced Skills	41.1	38.2

COMPANIES

100% of companies with more than 10 employees in Castilla y León have computers, 99.03% of which have an Internet connection. In 91.52% of cases, the Internet connection is broadband, a figure quite similar to the national average. 92.97% of companies use e-Government: in 81.23% of cases for routine procedures and in 72% of cases for Social Security payments. Likewise, 85.16% have an electronic signature, and it is more common to use it to carry out procedures with the Administration than in their relations with other companies.

If this analysis is carried out for companies with less than 10 employees, 81.25% of companies in Castilla y León have a computer, a figure similar to the national average (81.92%). Of these companies, 77.36% have an Internet connection (compared to 78.17% nationally), and of these, 77.94% have Broadband.

Thus, with regard to human capital, only 2.10% of companies with fewer than 10 employees have ICT specialists on staff.

On the other hand, the percentage rises to 13.29% in companies with more than 10 employees that have ICT specialists on staff, a higher percentage at national level, which stands at 18.40%. This may also be linked to the fact that in 75.79% of companies in Castilla y León with more than 10 employees, ICT functions are carried out by external suppliers, compared to 71% at national level.

On the other hand, 17.38% of companies in Castilla y León provide ICT training to their em-

ployees, compared to the national average of 20.77%.

TABLE 4. ICT SPECIALISTS AND PROFILES IN COMPANIES WITH 10 OR MORE EMPLOYEES (FIRST QUARTER 2020)
Source: Own compilation based on INE data. Survey on ICT Use and E-Commerce (EC) in companies 2019-2020. ICT in enterprises with 10 or more employees (first quarter 2020) by economic activity grouping.

	TOTAL COMPANIES	INDUSTRY	CONSTRUCTION	SERVICES	TOTAL COMPANIES	INDUSTRY	CONSTRUCTION	SERVICES
	SPAIN				CASTILLA Y LEÓN			
% of enterprises employing ICT specialists	18.40	17.34	7.48	21.58	13.29	10.48	13.87	14.83
% of companies that provided ICT training activities to their employees	20.77	18.50	13.04	23.67	17.38	11.92	15.80	21.09
% of companies that provided ICT training activities to their ICT specialist staff (1)	49.01	50.55	27.60	51.44	40.82	49.55	30.58	39.85
% of companies employing or attempting to employ ICT specialists	13.19	11.69	7.72	15.20	8.67	13.46	9.36	5.60
% of companies whose ICT functions were performed by external suppliers	71.56	74.22	63.49	72.43	75.79	80.26	57.62	77.86

Regarding the use of technologies, companies mainly use digital signatures, websites and social

media, as opposed to newer technologies such as cloud services, IoT, robots, *Big Data* and 3D printing.

TABLE 5. ICT USAGE IN CASTILLA Y LEÓN AND SPAIN
Source: INE. Survey on ICT Use and E-Commerce in companies. Percentage of total companies with Internet connection.

FIRST QUARTER 2020	INTERNET AND WEB	DIGITAL SIGNATURE	SOCIAL MEDIA	CLOUD SERVICES	BIG DATA	IoT	3D PRINTING	ROBOTS
SPAIN	78.1	84.3	63.0	28.2	8.5	16.8	5.0	8.9
CASTILLA Y LEÓN	73.2	85.2	61.3	23.1	6.2	18.3	4.7	8.8

EDUCATION, HEALTH AND SOCIAL CARE (DIGITAL PUBLIC SERVICES)

Within the framework of the RIS3 2014-2020, the Flagship Initiative “Connected Schools” has been developed. According to available information, 100% of primary and secondary schools have computer equipment and Internet access.

In terms of the ratio of computers per pupil in non-university education, Castilla y León has a higher ratio than the national average in Primary Education, while it is lower in Secondary Education and Vocational Training. Private schools are also below the national average

TABLE 6. STUDENTS PER COMPUTER USED FOR TEACHING AND LEARNING TASKS BY SCHOOL OWNERSHIP ^C. 2018- 2019 ACADEMIC YEAR. AVERAGE NUMBER
 Source: Statistics on Castilla y León, Equipment and use of ICT from MECD, Information Society and Communication in non-university educational centres.

INDICATOR	SPAIN	CASTILLA Y LEÓN
Total (public and private schools)	2.9	3.1
Total public schools	2.8	2.8
Total primary education in public schools	2.3	2.8
Total secondary education and VT in public schools	3.4	2.7
Total public schools	3.2	3.9

^C Computers intended primarily for use by teachers and for teaching students have been taken into account.

In the health sector ³¹, in 2019, in terms of ICT equipment, it should be noted that public hospitals in the region are better equipped than private hospitals. It is noteworthy that only 37.5% of public hospitals and 25% of private hospitals are equipped for telemedicine services.

In public hospitals, applications for order, inventory and logistics management are available in 100% of cases, while 87.5% are available for appointment and medical records management.

31 Statistics of Castilla y León, based on data from the Regional Ministry of Health and DG Budget and Statistics.

Challenges

1.5.3

Bottlenecks and challenges

The analysis of existing bottlenecks and challenges in the Community has been based on a review of the challenges, some of which are already of a structural nature, which as a country and as a Community were previously identified

in the *Country 2020 Report*³² prepared by the European Commission. In the field of R&I and digitalisation, the main vectors of the specialisation strategy, some of these challenges are:

- | | |
|---|---|
| <ul style="list-style-type: none"> • Low innovation performance, although progress has been made since 2011. | <ul style="list-style-type: none"> • The difficulty of multi-level governance of research and innovation policies. |
| <ul style="list-style-type: none"> • Low investment in R&D, which is detrimental to innovation performance. | <ul style="list-style-type: none"> • The low participation of SMEs in innovative projects. |
| <ul style="list-style-type: none"> • The lower quality of the Spanish public research system compared to the European average. | <ul style="list-style-type: none"> • The poor performance of public aid for private investment in research and innovation. |
| <ul style="list-style-type: none"> • Limited progress in developing systematic evaluations of public research and innovation policies. | <ul style="list-style-type: none"> • The shortage of ICT specialists, which interferes with the challenge of digitalisation. |
| <ul style="list-style-type: none"> • The low proportion of researchers employed by companies and the mismatch between tertiary education and market needs. | <ul style="list-style-type: none"> • SMEs' low take-up of new technologies. |



At Community level and during the working groups held for the preparation of the RIS3, the main challenges and bottlenecks for smart specialisation, industrial transition

and entrepreneurship were identified and contrasted, which will serve as a reference for the design of the actions of the smart specialisation strategy of Castilla y León. These

³² Report on Spain 2020 accompanying the COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN CENTRAL BANK AND THE EUROGROUP document. European Semester 2020: Assessment of progress on structural reforms and the prevention and correction of macroeconomic imbalances, and results of the in-depth reviews under Regulation (EU) No. 1176/2011.

are grouped into the following areas: R&I, digitalisation, business competitiveness, capacities and skills for specialisation and entrepreneurship, internationalisation-international collaboration and participatory governance.

With regard to industrial transition, challenges and bottlenecks have been identified and incorporated into the different areas of analysis, with particular emphasis on those related to digitalisation, training and capacity building, and business competitiveness and entrepreneurship.

SOCIO-ECONOMIC FACTORS

- Low talent retention capacity.
- Population ageing and population decline.
- Loss of companies.

R&I

- Ageing of researchers and general loss of R&D personnel. To a certain extent, it exceeds regional competences as it is subject to state regulations for replacement rates.
- Scarce effective collaboration between research groups to advance larger R&D projects and the multidisciplinary nature of these projects.
- Role of University-Business knowledge transfer below its potential and insufficient collaboration between R&D&I agents to face new challenges.
- Low capacity of international leading companies to: 1) perform R&D in the Community; 2) articulate innovation in the value chain.
- Lack of capillarity of R&D&I in small and medium-sized enterprises throughout Castilla y León.
- Role of clusters and hubs in R&D&I policy below their potential.
- Papel de clusters y hubs en la política de I+D+I por debajo de su potencial.
- Excessive administrative burden in the management of R&D&I projects, although progress has been made in digitalisation
- Low mobility of research staff between knowledge centres and companies and insufficient promotion of industrial doctorates.
- In the field of heritage, dependence on archaeological laboratories and companies that are not located in the Community, together with the absence of digitalisation activities and new technologies applied to the sector.
- Low visibility of the health sector in regional R&D&I, as a knowledge-generating agent, despite having high-level structures and carrying out translational research.

DIGITALISATION

- Lack of high-speed broadband infrastructure throughout the territory: hindering the development of tourism, new economic activities in rural areas, remote provision of health and social services, online training, etc.
- Lack of digital skills and competences of citizens and businesses.
- Lack of digital skills and competences in public administration (managers, health staff).
- Some resistance to change and use of digital media by public administration staff.
- Need for more investment in digital equipment and ICT applications for education, health, cultural policies and heritage.
- Lack of a national framework for student digital competence, as well as common models/tools for certification of teacher and student digital competence.
- Lack of business knowledge relating to disruptive technologies and their applications in processes: improvements and cost-benefit (returns on investment, not only economic).

BUSINESS COMPETITIVENESS AND ENTREPRENEURSHIP

- Territorial dispersion hinders collaboration between companies.
- Insufficient qualification of professionals to advance business competitiveness.
- Lack of connection of the education system and the businesses, especially in ICT and how to deal with digitalisation in small and medium-sized enterprises.
- Lack of information on the support lines available throughout the territory.
- Difficulties in accessing the Internet, especially in rural areas, which hinder economic activity.

CAPABILITIES AND SKILLS FOR S3 AND ENTREPRENEURSHIP

- Lack of adaptation of training to business and social challenges: both at university level and in vocational training.
- Shortcomings in vocational guidance: difficulties in providing adequate information to citizens on training pathways. Lack of knowledge on the part of students regarding the possibilities of companies in Castilla y León (except for the very large ones).
- Loss of talent.
- Ageing of teaching and research staff.
- Lack of digital skills at all levels.
- Lack of entrepreneurial skills and culture.
- Lack of technological profiles with the capacity to develop certain entrepreneurial ideas and of commercial or management profiles to bring innovative ideas to the market.
- Insufficient stimulation of STEM vocations in early childhood, primary and secondary education.
- Low scaling up of new innovative and/or technology-based business initiatives.
- Excessive administrative burdens for entrepreneurship.

INTERNATIONALISATION – INTERNATIONAL COLLABORATION

- Lack of a shared vision of the international positioning of Castilla y León in R&D&I: business, scientific and technological.
- Small size of businesses.
- Lack of specialised human resources to generate and manage international projects (proposal writing, contracts, financing, regulations, etc.).
- Low international attractiveness of universities and research centres for attracting talent.

PARTICIPATORY GOVERNANCE

- There is a lack of real and effective coordination between ministries and management bodies.
- Lack of continuous and permanent mobilisation of public and private actors in the development of the strategy.

1.5.4 Conclusions of the RIS3 2014-2020 implementation analysis

During the definition of the RIS3 2021-2027, an assessment was performed relating to the implementation of the specialisation strategy in the 2014-2020 period, based on the analysis of its annual monitoring reports.

The main conclusions of this assessment are the adequate execution of all the programmes and measures contemplated in the RIS3 2014-2020, highlighting the greater sophistication of financial instruments, the consolidation and good results of specific programmes such as Centr@tec (collaboration of technology centres with companies) and TCUE (university-business knowledge transfer) and the advances in digitalisation at all levels (companies, citizens and public services).

Less progress has been made in aspects linked, above all, to the dissemination and communication of the RIS3 as well as the existing instruments and aid to support companies, especially smaller ones and those far from innovation circuits, and the attractiveness of the Community for research and investment, the latter aspect linked to attracting talent to the Community, especially from a business point of view, which, although it was included as a specific programme in the 2018 update of the Strategy, still has a broad field of development.

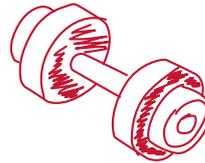
From the point of view of monitoring and evaluation, on the other hand, the difficulty in measuring progress in specialisation has been noted.

SWOT ^{1.5.5} analysis

The analysis of strengths, weaknesses, opportunities and threats is a central element for the definition of the RIS3 and the design of its actions. The intensive participatory process of RIS3 elaboration has generated an important source of information, including specific SWOT analyses for R&D&I, Digital Agenda, business competitiveness, capacities and skills for smart

specialisation and entrepreneurship, internationalisation and participatory governance. All this information forms part of the RIS3 2021-2027 Management Guide, a working document for the development of the strategy. The following table summarises the general SWOT of the Community, as a starting point for the strategic definition for the 2021-2027 period:

□ STRENGTHS



- Experience in the design and implementation of regional R&D&I and Information Society strategies.
- Good positioning of certain areas of the economy in international value chains (agri-food, transport) and a good starting position compared to other territories in terms of quality of life (uncrowded cities, natural and cultural heritage) and sustainability.
- Advanced level of R&D&I support infrastructures: technology centres, science and technology parks, clusters, and the more recently created digital hubs.
- R&D&I system reorganised around specialisation priorities.
- A powerful regional university system, reinforced by the presence of CSIC institutes and Singular Scientific and Technical Infrastructures (ICTS), with established models of collaboration between agents, which will facilitate progress in the smart specialisation of Castilla y León.

○ OPPORTUNITIES



- There is potential and interest for the integration of actions between sectors and priority areas of action to enable the development of transformative projects and new economic activity linked to regional smart specialisation and the challenges identified by Europe.
- A major mobilisation of both public and private actors in the quadruple helix of innovation, in the context of the definition of RIS3, and with the aim of perpetuating participation.
- Active participation of the RIS3 management bodies and those responsible for the management of European funds, which lay the foundations for the fulfilment of the enabling conditions set out in the Regulations for the 2021-2027 period.

◇ WEAKNESSES

- Population loss and ageing.
- Lack of communication of regional attractiveness for talent retention and attraction.
- Gradual loss of business fabric (already prior to the crisis generated by the Covid-19 pandemic).
- The need to strengthen participatory governance, with clear mechanisms and instruments for collaboration and decision-making with a view to specialisation.
- Need for further coordination and establishment of synergies and complementarities between existing capacities and infrastructures.
- Although it has increased significantly in recent years, further progress needs to be made in the university-business-society relationship and in knowledge transfer.
- University education and vocational training are still poorly adapted to the requirements of companies, especially in the face of the challenges of digitalisation and circular economy.
- Lack of STEM vocations, where there is also a gender gap.



⤿ THREATS

- Negative impact of the crisis generated by Covid-19 on Community businesses, both in terms of employment and general economic activity.
- Risk of talent relocation, due to the global rise of teleworking.
- The rise in Europe of policies for the integration of complete value chains in the same territory, which would hinder the development of certain key sectors for the economy of Castilla y León (agri-food, automotive, capital goods, etc.).
- Risk of loss of competitiveness of smaller companies if they fail to progress in their digitalisation, with adequate connectivity infrastructure.



1.5.6 Recommendations for the 2021-2027 period

On the basis of the results of the previous diagnosis and the results of the work carried out with the agents of the Community's R&I ecosystem, it is necessary to advance in policies, programmes or measures that, among other aspects, address the retention and attraction of talent to the Community, so that, in addition to contributing to the consolidation of capacities for innovation, they can address critical aspects for the Community, such as population ageing and the demographic challenge.

Likewise, given the size of the territory and the profile of existing companies, where micro and small enterprises predominate, and many of them are linked to more traditional activities, it will be necessary to address the extension of innovation and digitalisation, as well as business support services throughout the Community, thus contributing to greater territorial cohesion. Infrastructure, both in terms of connectivity and mobility of people and goods, will also play a key role in this regard. The digitalisation of the economy and society and the creation of digital skills for this purpose, at all levels (population, public administration and business) should also be the focus of the new RIS3, as well as addressing a greater link between training-education and the needs of the productive fabric.

On the other hand, Castilla y León has an ecosystem of R&I agents with experience and trajectory, and with skills aligned with the bases established for the smart specialisation of the Community, hence supporting these agents (technology centres, research centres, *clusters*, *hubs*, etc.) should be a priority to address the challenges of ecological and digital transition faced by the Community.

Meeting spaces and stable collaboration between R&I agents and between these and companies in Castilla y León must also be the focus of public activity for the 2021-2027 period, above all in order to maximise knowledge and technology transfer and improve competitiveness. In addition to intra-Community collaboration, inter-regional and international collaboration, both at public and private levels, will facilitate the development of excellent research and business R&D.

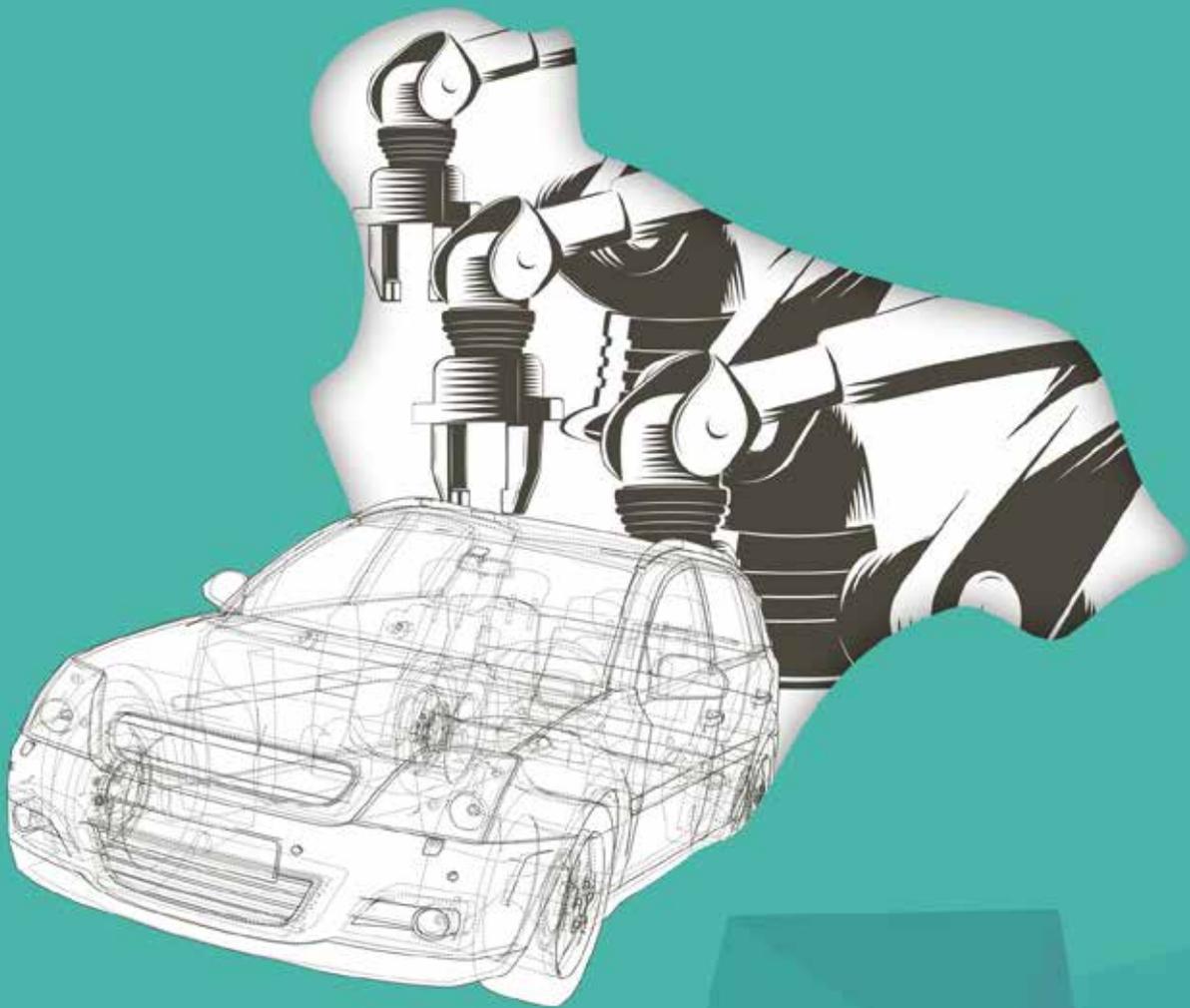
From the public sphere, smart specialisation and the necessary commitment to the discovery of new business opportunities, which arise on the basis of the hybridisation of knowledge and multi-sector technologies, will require further progress in the coordination of policies and their management bodies. ●



Research and
innovation
strategy
for smart
specialisation
(RIS3) of
Castilla y León
2021- 2027

A decorative graphic consisting of three concentric circles in shades of light blue and teal, with the number 2 centered in the innermost circle.

2



2.1 Vision and mission

The Vision of the strategy constitutes the horizon towards which to direct the actions carried out in the coming years in Castilla y León in the field of R&I and the Digital Agenda. The statement has been constructed and contrasted during the participatory process of the RIS3 and encompasses the shared vision of the agents of the science, technology, business and society system of Castilla y León. This vision reflects the strengths of which we are most proud, such as having a territory with quality of life, an exemplary education system, with opportunities for training and personal and professional development in various fields, and with highly competitive sectors worldwide.



**CASTILLA Y LEÓN,
A TERRITORY WITH QUALITY
OF LIFE, WITH TALENT AND SKILLS
THAT DRIVE A PERMANENT
TRANSFORMATION BASED ON ITS
COMPETITIVE ADVANTAGES.**

The Mission defines the *raison d'être* of the RIS3 2021-2027, identifying the way forward to achieve the Community Vision by 2027. Its wording is also the result of the participatory process and conceives RIS3 as a transformative element, with the aim of advancing smart specialisation. ●



**TRANSFORMATION OF SOCIETY
AND ECONOMY TOWARDS A MORE
DIGITAL AND SUSTAINABLE MODEL,
CONSOLIDATING AN ECOSYSTEM
THAT APPLIES INNOVATIVE
SOLUTIONS TO OVERCOME
THE CHALLENGES WHICH
CASTILLA Y LEÓN IS FACING.**

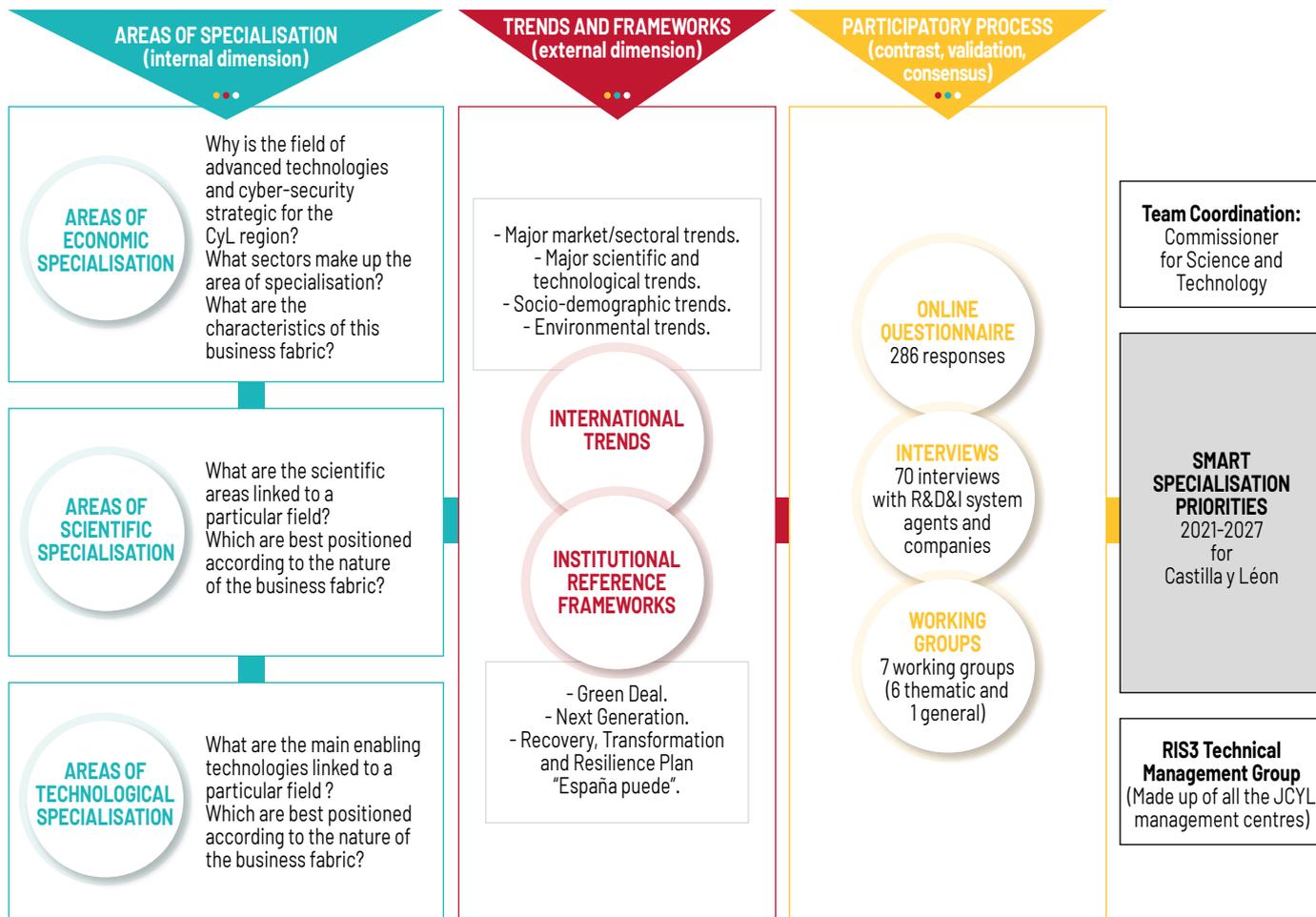


2.2 Priorities for smart specialisation in Castilla y León. A new approach

Smart specialisation is based on prioritising investment in areas identified through an inclusive and evidence-based participatory process, with the engagement of all stakeholders.

The preparation of the RIS3 has been based on a rigorous analysis of the context and reference framework, including the economic structure, the science, technology, business and society system, educational and R&D&I

capacities, and the characterisation of Castilla y León's areas of specialisation. This analysis has been completed with the evaluation of the implementation of work plans, indicators and resources mobilised in RIS3 2014-2020. Finally, a review of current international trends and frameworks has been carried out. All of this has fed into a participatory process in which the possible stakes for our Community have been identified, defining the priorities for the coming years.



70

diagnostic interviews

280

companies online survey

332

actors in the Thematic Tables

335

actors in the EDP Tables

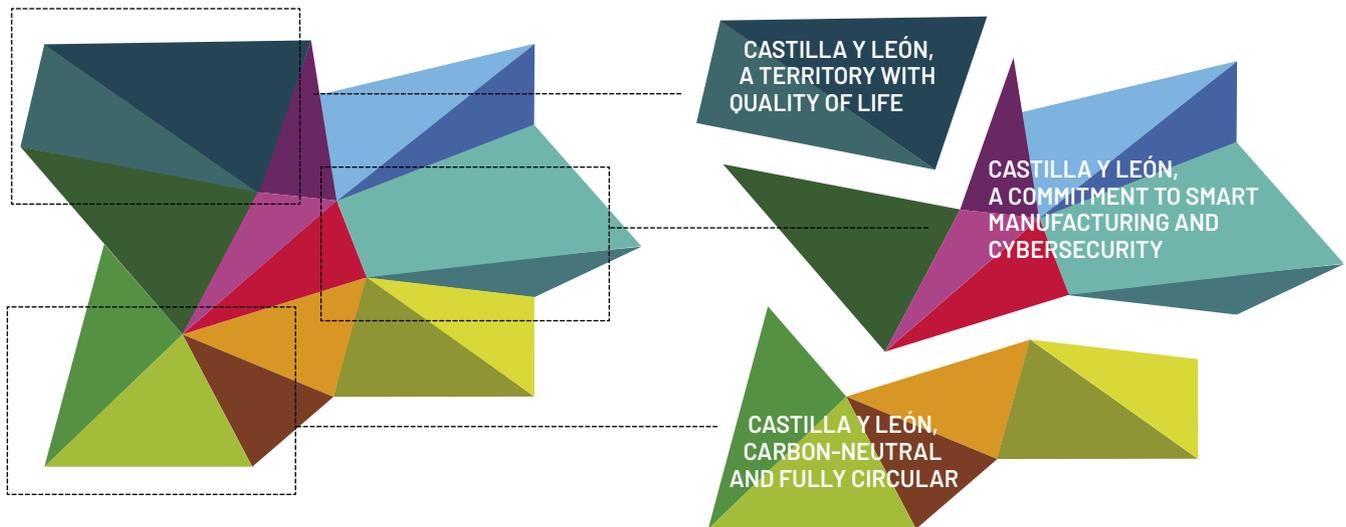
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interviews contrast phase

The result of this process has been a new focus on priorities, which no longer describe specific sectors or areas of action, as in the previous period, but define three vectors of transformation, which reinforce the transformative role identified in the strategy's mission and

which will align efforts in a more cross-cutting, inclusive and powerful way.

These priorities will be developed within the participatory entrepreneurial discovery process, which will be maintained on an ongoing basis throughout the life of RIS3.



The RIS3 of Castilla y León 2021-2027 sets out **three main specialisation priorities**. All of them are closely connected to the characteristics and assets of our Community, granting them a differentiating element even in global trends such as sustainability or digitalisation.

These priorities are conceived as **transformational vectors for the economy and society, aligning the efforts of the different economic sectors and the Community's scientific and technological capacities with the vision for 2027.**

Important!

**PRIORITY: Castilla y León,
a territory with quality of life**



Agri-food sector: Positioning in niches related to demand shifts, safe and quality food, food and health.

New **business opportunities in biomedicine** (personalised medicine, cancer, etc.)

Innovative **health and care services** (telemedicine, telecare), robotic devices for care, artificial intelligence and technology platforms for integrated service delivery.

New **habitat concepts** in the design of a sustainable and quality environment for people in urban and rural areas (smart rural territory).

Silver Economy: products and services for senior and pre-senior population, active and healthy ageing.

New formulas for **experiential tourism** in the cultural, gastronomic, nature and language areas.

This high priority is focused on one of the distinctive features of Castilla y León: there are no overcrowded cities, we have an incomparable cultural heritage and an internationally acclaimed cultural and gastronomic offer. We also have a diverse natural heritage, well preserved and connected to the cities and towns so that citizens can enjoy it, and which offers natural resources, such as natural foods and medicines, in line with new trends in demand. In our Community there is also a widespread social and political awareness of the specific contribution of health promotion to social welfare.

We also have very good opportunities for training and personal development, with specialised and quality employment. Our education system stands out in international reports such as PISA and TIMSS, and we have an important educational offer in vocational training and a very strong university system. This priority aims to build on the unique advantages that our Community offers to generate economic opportunities, social progress and make this an area where people want to live.

Castilla y León is a leader in food quality figures and has an agri-food industry and sector with many possibilities to take advantage of global trends to position itself in previously identified niches (changes in demand, health and quality of life, etc.). The potential of agri-food to contribute to this priority is decisive, given that

the quality and food safety of our food products are appreciated worldwide.

This sector is closely linked to the territory and can also contribute to alleviating the problem of depopulation with the implementation of technological and innovative measures that increase the transparency of the value chain, favouring the profitability and competitiveness of the primary sector, ensuring its permanence in the rural environment.

At the same time, the very characteristics of the Community's population (demographic ageing) and territory (remote population centres) make it an ideal territory for positioning itself among many of the important global trends in health and health care. The issues being worked on today in Castilla y León, to respond to rural dispersion and ageing and the general increase in the number of elderly people living alone, are several years ahead of the needs of other European territories. This constitutes an opportunity to position itself in the implementation of innovative health and care services (telemedicine, telecare) based on new technologies, and in the design, production and marketing of robotic devices for care, artificial intelligence and technological platforms for the provision of comprehensive services. All this makes the Community of Castilla y León a leader in the so-called *Silver Economy*, and significant progress is already being made in Active and Healthy Ageing, which

is directly linked to the meaning of this priority. In the field of health, we can also be pioneers in certain fields of biomedical research (cancer and personalised medicine), which can be exploited to generate new business opportunities and attract talent. And, also, beyond leading advances in biomedical research, a territory with quality of life must aspire to lead in the application of advances and technologies in the prevention and early detection of illnesses.

On the other hand, Castilla y León has unique characteristics to lead new habitat concepts in the design of a sustainable and quality environment for people, taking advantage of public-private collaboration in the Habitat sector, promoting production, construction and responsible consumption and, in short, making this economic activity a generator of well-being, balance and sustainability. In the urban sphere, taking advantage of the characteristics of our cities, there is an opportunity to implement new solutions based on more accessible, comfortable and healthy buildings and environments, in addition

to the opportunities offered by the rehabilitation and reuse of cultural heritage and historic urban centres. In rural areas, the opportunity lies in a new concept of quality of life and economy, which integrates landscape, natural and cultural values with an adequate supply of services and opportunities (smart rural territory) as one of the doors to the future of our Community. In this new concept, technological measures allow rural and urban cohesion, making our villages a means for entrepreneurs to settle down, advancing in the implementation of sustainable and multifunctional management, linking economic activities (e.g. forestry management and extensive livestock farming, or tourism and agri-food).

Also important in this priority will be the integration of social sciences and humanities aspects in the development of new business ideas, which will benefit the exploration of new experiential tourism formulas in the cultural, gastronomic, nature and language areas, and in general the capacity of Castilla y León to retain and attract talent.

Important!

**PRIORITY: Castilla y León,
carbon-neutral and fully circular**



Sustainable approach to **primary sector** activities, preserving biodiversity, boosting the circular economy and minimising the carbon footprint.

Bioeconomy: Bioproducts and biomaterials for industrial application, comprehensive assessment, bio-based industrial processes for the development of bioproducts.

Eco-innovation and industrial environment in the **modernisation of the economy:** decarbonisation, eco-design, implementation of eco-efficient technologies, promotion of the circular economy.

Use of **renewable energies** and progress in manageability, decentralised generation and distribution, self-consumption as well as in zero consumption building and urban planning.

Sustainable transport and mobility: development of electrified, connected, autonomous and sustainable vehicles; and the use of recycled materials or lightweight biomaterials and new functionalities in rural and urban mobility.

Castilla y León is a territory with excellent biodiversity and environmental indicators and is a model territory in areas such as bioeconomy, or for leading responses to global challenges such as climate change, biodiversity loss and environmental pollution. The confluence of our Community's capacities with global trends and the challenges of the European Union for the coming years will enable Castilla y León to position itself as a spearhead in the transition of society and the economy towards a sustainable model. This priority aims to decarbonise activity (productive and non-productive), making progress in the implementation of more circular processes and economies throughout the value chain, including the primary sector, the transformational sector and the marketing; promoting the values of sustainability in all areas of organisations and encouraging a commitment to responsible consumption acquired by citizens. The ecological transition of the economy is a global challenge in which Castilla y León has very interesting opportunities and advantages compared to other regions and which will contribute to increasing its resilience in the face of future crises.

A first area of this priority is to boost the sustainability of agricultural, forestry, livestock and mining activities, promoting circular economy and minimising the carbon footprint in the framework of the fight against climate change and the conservation of biodiversity (reduction

of inputs, preservation of water and environmental resources, biodiversity, soil recovery, etc.). Sustainable and multifunctional forest management, overcoming the challenge of smallholdings, professionalising and digitalising management and developing reforestation and management for carbon sequestration, will also contribute to forest fire prevention.

Continuing Castilla y León's commitment to the bioeconomy is another area of this priority, given the size of its agricultural and forestry sectors, the weight of agro-industry and its strengths in biotechnological R&D. Bio-based products and materials with industrial applications offer the advantage that they can be renewable and therefore have a very important role to play in this priority. However, bioproducts have also shown great potential in a variety of applications, where they sometimes have advantages over conventional products. The development of innovative value chains for these bio-based products and materials will therefore be of interest. There are also opportunities for Castilla y León to specialise in the promotion of innovative solutions for the use of natural materials from sustainable and renewable sources, such as wood construction. These solutions, together with the development of forest product value chains, will have a positive impact on the areas most threatened by depopulation, on territorial cohesion and on climate neutrality.

This priority also includes progress in eco-innovation and the industrial environment, in the modernisation of all sectors of our economy. This will involve the decarbonisation of the industry, the full adoption of eco-design, the implementation of eco-efficient technologies, the development of sustainable industrial processes, and the promotion of the circular economy for the recovery of by-products and waste. In particular, this process must focus on those sectors in which Castilla y León is a leader, such as the automotive and agri-food sectors, and those in which there are important niches of opportunity.

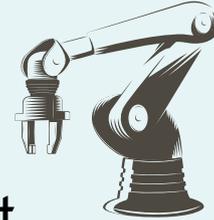
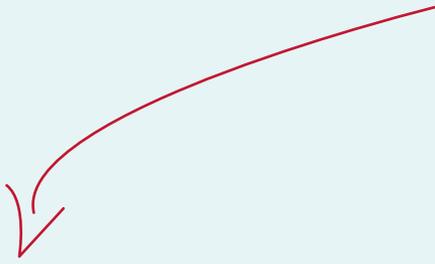
The concept of ecological transition is particularly relevant to energy, which has implications for all human activity, economic or otherwise. This implies the development of different aspects of renewable energies, including new greens, technologies, processes, etc., progress in the concepts of management capacity, decentralised generation and distribution, self-consumption, zero consumption building and urban planning, as well as energy communities, participative financing systems or the

synergistic collaboration of rural entities in the energy field. In addition, it will be necessary to find ways to make energy activity a driver for rural development.

Establishing meeting points between the primary sector (producer of raw materials and consumer of products and energy), with industrial rural development, the energy industry and the implementation of bio-based industrial processes focused on the development of bio-products, is a necessary aspect to maintain food and energy independence and to increase the resilience of the economy in the event of crisis situations.

Finally, this priority envisages sustainable transport and mobility as essential elements for the ecological transition in our Community, including the development of the electrified, connected, autonomous and sustainable vehicle; the use of renewable fuels and the use of recycled materials or lightweight biomaterials and with new functionalities in rural and urban mobility (which is complemented by some aspects included in the next priority).

Important!



PRIORITY: Castilla y León, a commitment to smart manufacturing and cybersecurity

Application of **advanced technologies** (artificial intelligence, 5G networks, data and metadata analysis, Internet of Things (IoT), etc.). From Industry 4.0 to Industry 5.0.

Agriculture and Livestock 4.0,
Forestry 4.0, **Mining** 4.0.

Advanced manufacturing: Incorporation of intelligence in production processes, use of emerging technologies, advanced electronics, new materials, and integration of the concepts of efficiency and sustainability.

Cyber-security.

The capacity of companies in Castilla y León to develop their activity in more competitive sectors will contribute to strengthen the generation of wealth and employment in our Community, resulting in greater economic and social welfare and greater resilience. One of the main drivers of

our economy lies in a large and highly specialised business fabric, which represents an important contribution to the gross domestic product of our Community. Our economy is facing a new digital context and the application of advanced technologies. Areas such as artificial intelligen-

ce, 5G networks, data and metadata analysis, Internet of Things (IoT) in companies achieve more flexible and efficient processes and the development of better products, services and business models. All of this opens up new horizons, placing companies in general and industry in particular before the global challenge of the fourth industrial revolution, the so-called Industry 4.0. Together with advances in the circular economy and the development of human-machine interaction, the foundations will also be laid to address the emerging Industry 5.0, a sustainable, resilient and people-centred industry.

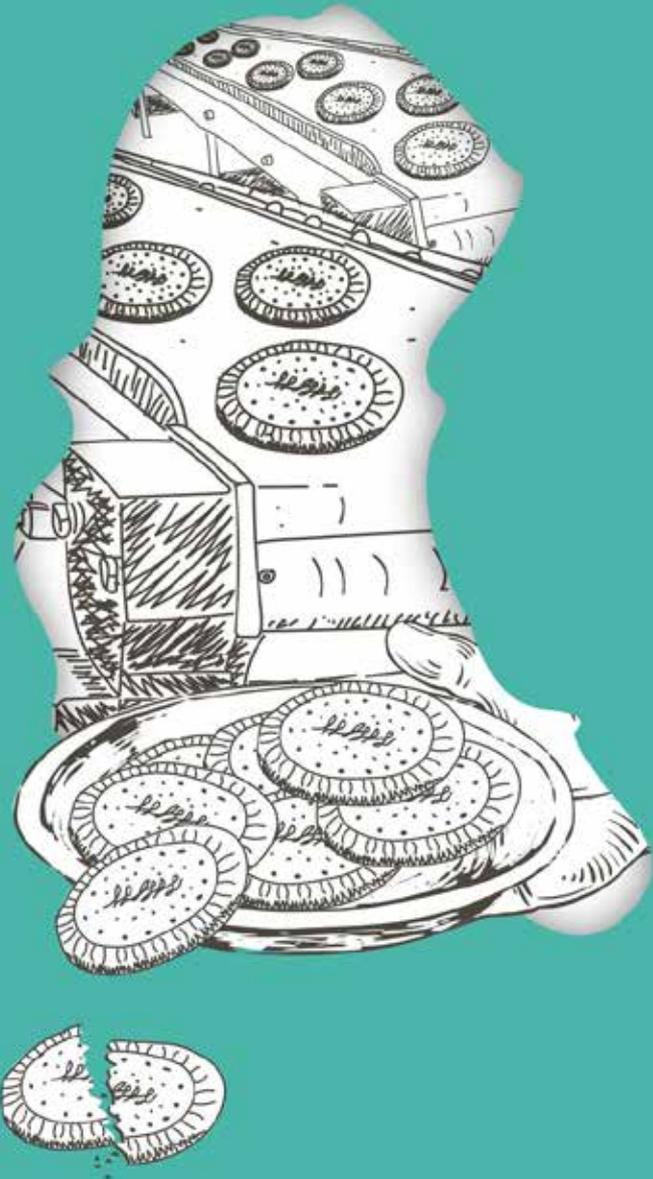
It is also necessary to consider the clear commitment to the so-called agriculture and livestock 4.0, the digitalisation of the forestry sector and mining 4.0, with very positive implications in sparsely populated territories.

Advanced manufacturing goes beyond Industry 4.0, requiring the incorporation of intelligence in production processes, the use of emerging technologies, new materials, and the integration of the concepts of efficiency and sustainability. It is a Community commitment that affects not only manufacturers of consumer goods but also agents along the entire value

chain that provide products and services with a solid domestic market in the Community, capable of generating employment and retaining the population, but at the same time opening up national and international markets with its own technologies, generated in Castilla y León.

This positioning will increase as our companies contribute to the development, and also the application, of the emerging enabling technologies that will emerge over the next seven years. This deployment will involve technological areas such as innovation in materials, which will be increasingly important in the incorporation of new functionalities and the development of products with greater added value, without forgetting advanced electronics and all those technologies that contribute to the improvement and innovation in the production processes of companies in Castilla y León.

Connectivity and digitalisation also require advances in cybersecurity, where Castilla y León is a pioneering community, with a digital ecosystem based on cybersecurity and advanced technologies, to bring the benefits of digitalisation to companies and help them to accelerate their processes of adopting digital technologies. ●



2.3 RIS3 2021-2027 objectives

The Research and Innovation Strategy for a Smart Specialisation of Castilla y León 2021-2027 is conceived as an instrument to increase the competitiveness of the activities in which Castilla y León specialises, not only through its digital and ecological transition, but also by taking advantage of digitalisation, decarbonisation and the sustainability demanded at European and global levels as niches of opportunity, without losing the hallmark identity of Castilla y León.

All this, under the premise of developing the scientific and technological potential of the Community's innovation ecosystem, taking advantage of existing capacities and developing those required to tackle economic and social challenges through the collaboration of public and private agents, with an international perspective.

The definition of the objectives of the RIS3 2021-2027 of Castilla y León is based on the diagnosis presented in the first part of this do-

document, which includes an analysis of the main socio-economic indicators, the existing capacities, the identification of the main challenges and bottlenecks for the diffusion of innovation in Castilla y León, the evaluation of the actions implemented in the previous RIS3 (2014-2020) and the current trends in international technology markets.

Thus, the objectives cover four essential aspects of the strategic approach: developing smart specialisation priorities, improving and strengthening the R&I ecosystem, advancing the digitalisation of the economy and society, and strengthening participatory governance for specialisation.

Each of these aspects corresponds to an objective of the RIS3 2021-2027. These will include actions aimed at responding to the challenges and bottlenecks identified in the diagnosis, as well as taking advantage of strengths and opportunities; and solving, as far as possible, existing weaknesses and threats.

OBJETIVOS	EJES DE ACTUACIÓN
<p>OBJECTIVE 1:</p> <p>Developing specialisation priorities.</p> <ul style="list-style-type: none"> ● Castilla y León, a territory with quality of life. ● Castilla y León, carbon-neutral and fully circular. ● Castilla y León, a commitment to smart manufacturing and cybersecurity. 	<ol style="list-style-type: none"> 1.1. Promote flagship initiatives in a public-private partnership framework. 1.2. Develop the system of support for transformative challenges for the economy and society of Castilla y León. 1.3. Promote the implementation of plans, programmes and other sectoral initiatives that contribute to the development of RIS3.
<p>OBJECTIVE 2:</p> <p>Improve and strengthen Castilla y León's research and innovation ecosystem to advance specialisation.</p>	<ol style="list-style-type: none"> 2.1. Develop and maintain capacities for smart specialisation. 2.2. Increase R&I in Community businesses. 2.3. Foster and support entrepreneurship and intra-entrepreneurship in the area of R&I 2.4. Develop excellence in research and enhance knowledge transfer.
<p>OBJECTIVE 3:</p> <p>Castilla y León's Digital Agenda: taking advantage of the benefits of digitalisation.</p>	<ol style="list-style-type: none"> 3.1. Digital Connectivity and Infrastructures. 3.2. Digital transformation of companies. 3.3. Digitalisation of public services. 3.4. Digital skills.
<p>OBJECTIVE 4:</p> <p>Strengthening participatory governance for specialisation.</p>	<ol style="list-style-type: none"> 4.1. EDP^D for the development of transformative challenges. 4.2. EDP in the strategic management of specialisation.

^D EDP: Entrepreneurial discovery process, or process of discovery of entrepreneurial opportunities.

Detailed objectives^{2.3.1} and lines of action

OBJECTIVE 1: Developing specialisation priorities

Prioritisation remains one of the core concepts of smart specialisation strategies, with the ambition to reinforce more powerful and result-oriented innovation ecosystems. The priorities of the RIS3 2021-2027 of Castilla y León aim to concentrate business and institu-

tional efforts and the scientific and technological capacities of the Community, in a multidisciplinary, multi-sectoral and integrating manner; overcoming barriers between areas and sectors of action to align around three major vectors of transformation:

Castilla y León, a territory with **quality of life**.

Castilla y León, **carbon-neutral** and fully **circular**.

Castilla y León, a commitment to **smart manufacturing** and **cybersecurity**.

The development of specialisation priorities becomes the first of the RIS3 objectives for the 2021-2027 period. This represents a change from the structure of RIS3 in the previous pe-

riod, which had a matrix structure of priorities on the one hand and strategic objectives on the other. This new approach aims to further reinforce the prioritisation nature of the strategy.

The development of these priorities is mainly articulated through three mechanisms:

- ✧ Implementation of flagship initiatives, with the leadership of the Regional Government of Castilla y León in a public-private partnership framework.
- ✧ Develop the system of support for transformative challenges for the economy and society of Castilla y León.
- ✧ Promote the implementation of plans, programmes and other sectoral initiatives that contribute to the development of RIS3.

This should help to define roadmaps for each priority within a participatory governance process for specialisation, described below.

LINES OF ACTION

1.1. Promote flagship initiatives in a public-private partnership framework

These initiatives are conceived as a series of clear commitments by the Administration in collaboration with the business sector of Castilla y León, capable of having an impact on the objectives of the RIS3 by concentrating resources and aligning instruments. These are initiatives that build on an already articulated and functioning ecosystem.

Initiatives must be aligned with the priority approach and approved by the management structures before becoming part of RIS3 2021-2027 (the approval process is set out in the RIS3 management guide). This is a significant novelty given that, although there were flagship initiatives in RIS3 2014-2020, there was no possibility that the development of priorities within a participatory process could incorporate new ones

To ensure their impact, flagship initiatives have to meet both thematic and formal criteria:

The priorities aim to concentrate efforts in a multi-disciplinary, multi-sectoral and inclusive manner.

FLAGSHIP INITIATIVES

Criteria relating to subject matter and content:

- ➔ They must be initiatives that are already defined, that are clear commitments on the part of the Regional Government of Castilla y León in terms of budget and leadership.
- ➔ Existence of a functioning ecosystem in the Community that can develop the activities (clusters, technology centres, universities, with evidence that there is already collaboration between agents).
- ➔ Castilla y León is already clearly positioned in relation to other Spanish and European regions.
- ➔ The activities to be developed in the flagship initiative (in many cases, the supporting instruments) are already identified.
- ➔ Impact on the Community's economy (employment generation, business competitiveness, etc.) in one of the RIS3 priority areas.
- ➔ Proximity to the market of existing scientific and technological capabilities in terms of technological maturity (TRL 5-9) and time to achieve the desired impact.

Formal criteria:

- ➔ Management centre of the Regional Government of Castilla y León responsible for the coordination of the initiative.
- ➔ Quantified objectives, timetable and investment plan.
- ➔ Identification of the quadruple helix actors who can achieve the objectives.
- ➔ Training plan.
- ➔ Communication plan that gives visibility to the Community's transformation in this area.
- ➔ Body for monitoring and evaluating the actions.

1.2. Develop the system of support for transformative challenges for the economy and society of Castilla y León

RIS3 2021-2027 is intended to be an agenda for economic and social transformation; and as such, the implementation of transformative challenges aligned with the focus of the priorities is a central element for this period.

Transformative challenges arise at the initiative of the agents involved in the entrepreneurial discovery process (companies, techno-

logy centres, research centres and universities, the Administration and society in general). The challenges have to be aligned with the focus of the priorities and approved in accordance with the governance system before becoming part of the RIS3 2021-2027.

Transformative challenges must meet thematic and formal criteria:

TRANSFORMATIVE CHALLENGES

Criteria relating to subject matter and content:

- ⇒ Ambitious, in line with the specialisation priorities, multidisciplinary in nature, with an impact on the Community's economy and for which there is no transformative challenges already underway that totally or partially overlaps the objectives.
- ⇒ Proximity to the market of existing scientific and technological capabilities in terms of technological maturity (TRL 5-9) and time to achieve the desired impact.
- ⇒ It may be the sum of smaller projects which, a priori, are not yet fully formulated, as they are defined in the context of the EDP.
- ⇒ Existence of agents of different natures (quadruple helix) that, although not articulated, can form the ecosystem for the development of the challenge. Representation of all the components of the quadruple helix: companies, R&I centres, Administration, society.
- ⇒ Open to the incorporation of new members and smaller projects aligned with the focus of the overall challenge.

Formal criteria:

- ⇒ Consortium that can be coordinated by an agent external to the Regional Government of Castilla y León.
- ⇒ Quantified objectives, timetable and planned sources of investment.
- ⇒ Management, monitoring and evaluation body for the actions, comprising both the actors involved and the Regional Government of Castilla y León.

Developing the support system for the transformative challenges will involve working on and identifying the financing mechanisms that the Regional Government of Castilla y León can put in place for their development. Likewise, it will be essential to identify sources of funding that, at national and international level, prominently contemplate thematic areas similar to those prioritised in Castilla y León, and which, therefore, represent an additional source of resources.

It also means continuously working on the identification of agents of the quadruple helix of innovation, who can play an important role in the development of these challenges, esta-

blishing contact and collaboration networks. In this respect, it will be important to identify the so-called "hidden innovators", who can contribute a differential vision and capabilities to the development of transformative challenges, in addition to the promotion of open innovation by the Community's public administration.

Although the transformative challenges arise from the competitive and comparative advantages of the Community's ecosystem, they are an element that will enable the establishment of interregional collaboration relations, given that elements such as the decarbonisation of productive activity, sustainability, health

challenges, social care and ageing, to name but a few, are of a global nature.

The support system will also include the sources, networks and platforms of information and collaboration in which public and private agents in Castilla y León participate, from the point of view that they will provide information on the state of the art and technological development, which is key to making progress in new products, new technologies, new services and new knowledge.

*Transformative challenges
arise in the proces of
entrepreneurial discovery,
at the initiative of companies,
technology centres, research
centres and universities.*

1.3. Promote the implementation of plans, programmes and other sectoral initiatives that contribute to the development of RIS3

The third axis for the development of the specialisation priorities indicated in the RIS3 is based on coordinated support for the implementation of the different plans, programmes and actions of a sectoral nature promoted by the Regional Government of Castilla y León through its different management centres.

In this strategic axis, a roadmap will be maintained for each specialisation priority, facilitating the alignment of the different plans and programmes with the RIS3 priorities and identifying opportunities for the future.

These roadmaps will be based on the detailed formulation of priorities and will be developed with contributions from the different sectoral plans, programmes and actions, as well as from the flagship initiatives and transformative challenges that are launched.

OBJECTIVE 2: Improve and strengthen Castilla y León's research and innovation ecosystem to advance towards specialisation

In order to achieve smart specialisation, it is essential to ensure a powerful, cohesive research and innovation ecosystem, with top-level scientific and technological skills capable of dealing with the challenges identified in the diagnosis, which Castilla y León faces.

This objective includes measures promoting education and training, knowledge generation, business innovation, innovation-based entrepreneurship and knowledge transfer.

As a characteristic aspect of our Community, this objective also includes innovation and the development of the skills of the business fabric located in the rural territory of Castilla y León.

LINES OF ACTION

2.1. Develop and maintain capacities for smart specialisation

This first axis focuses on building capacities for specialisation on two fronts simultaneously: education and training, on the one hand, and capacities to meet the R&I challenges, on the other.

In order to achieve smart specialisation, it is necessary to have a solid R&I system that allows knowledge to be generated, and for innovative solutions to be developed and implemented in the market and society. This means having the talent and structures in place for specialisation.

At the same time, education and training play a very important role in capacity building through the development of skills for research, innovation, digitalisation and entrepreneurship at all levels of education and in job training.

LINES OF ACTION

PERSONS

- Training and recruitment of researchers, offering opportunities throughout their research career (from the doctoral stage to recruitment as distinguished researchers), support technicians, training of R&D&I managers, consolidating and intensifying research activity in biomedical research and other training actions, such as international mobility. Practical training in innovative entities through R&D practices of excellence and promotion of the recruitment of these professional profiles.
- Fostering expert technological talent: creating "digital leaders" in companies through high-level training in future issues and disruptive technologies, promoting specialist profiles linked to the requirements of digitalisation in all economic areas.

R&I STRUCTURES

- Funding of R&I structures, including support to public universities in Castilla y León for capacity building (INFRARED network infrastructure programme and investment programme). Support for the consolidation of the network of technology centres, support for IESCYL and biomedical research structures in the field of health, the Centre for the Conservation and Restoration of Cultural Heritage in the field of heritage and the ICTS located in our Community (CENIEH, CLPU and SCAYLE).

EDUCATION AND TRAINING

- Development of STEM vocations in school education.
- Linking education and business in the field of vocational training and higher education: curricular adaptation of educational content (bachelor's and master's degrees) to smart specialisation opportunities, dual VT in the field of vocational training, industrial doctorates at university level.

2.2. Increase R&I in Community businesses

This strategic axis responds to the need to boost the competitiveness of Community businesses on the basis of innovation and the generation of economic activity from innovative products, processes or services. To this end, it is necessary to continue to increase R&I activity in the Community, supporting companies that already carry out R&I activities on their own initiative with their own resources and in collaboration with other agents, but also smaller companies through the key agents of the innovation system.

Under this approach, technology centres and other agents dedicated to knowledge transfer will be key to fostering an innovation market with the Castilla y León brand, which will also benefit from the existence of financial instruments and other lines of support from the administration, such as innovative public procurement or the approach to national and international programmes.

All of this will be complemented with a greater effort in the dissemination and communication to companies of the existing support opportunities from the Regional Government of Castilla y León,

trying to ensure that more and more companies in our Community participate in these R&I aid programmes developed by the different ministries and paying particular attention to the rural area.

LINES OF ACTION

INNOVATION

- Intensifying innovation along the value chains in the priority areas of Castilla y León requires dissemination, communication and training actions (technical, management, ecological, entrepreneurship, etc.), promoting collaborative dynamics (mobilising the capacities for specialisation that we are developing), favouring open innovation and the combination of knowledge and technologies.
- Development of different lines of aid for R&D&I, including the financing of strategic projects for companies, collaborative projects between businesses and technology centres and support programmes for clusters in Castilla y León, as key agents in the innovation ecosystem that facilitate the dynamics of collaboration and the transfer of knowledge and technology. .

FINANCIAL INSTRUMENTS

- For the financing of R&I in the territory, the Community Administration will continue to work on the evolution and sophistication of existing financial instruments, as well as developing others that are more in line, for example, with the requirements of interregional investment for specialisation, always in accordance with the profiles and casuistry of companies and agents in Castilla y León.

PARTICIPATION IN NATIONAL AND INTERNATIONAL PROGRAMMES

- Support for participation in national and international projects and programmes, not only as funding mechanisms, but also as tools that facilitate the establishment of contacts and the acquisition of knowledge, thus facilitating the open innovation processes that we wish to promote and encourage in this period. One mechanism for their promotion will be the co-financing of international R&D&I programmes by the Community administration.

INSTITUTIONAL COLLABORATION

- From the Administration's point of view, and as has been the case in recent years, work will continue on the establishment of agreements and collaboration agreements at international level and, specifically, with European regions. These agreements will also include the exchange of experiences and good practices in R&I and digitalisation policies and programmes; this aspect of knowledge exchange between peers is more relevant in the current period where global challenges such as decarbonisation, climate change, health, population ageing, the demographic challenge, etc. are common to many territories.

INNOVATIVE PUBLIC PROCUREMENT

- Promotion of innovation and the development of new markets through public procurement from the different management centres of the Regional Government of Castilla y León. Detection of technological needs not covered by the market, dynamisation and accompaniment in innovative public procurement processes. Qualification of administrative units. Programmes will also continue to be developed to support concept testing, prototyping and validation of products, technologies and solutions, both for established companies and for start-ups and/or newly created companies, both from the business and scientific spheres.

PROJECTS BANK IN RURAL AREAS

- Promotion and dynamisation of a projects bank in rural areas, establishing the necessary support mechanisms for their development. The rural environment of Castilla y León is a source of wealth and has great potential for the development of new economic activity, especially linked to strategic areas of the Community's economy such as agri-food, tourism and the forestry industry.

2.3. Foster and support entrepreneurship and intra-entrepreneurship in the area of I&I

The third line of action focuses on promoting the creation of new companies and lines of business, and even the creation of *start-ups*, in existing companies, around the priorities of specialisation,

with continued support to ensure their consolidation and growth, thus covering niches in the value chains and strengthening the Community's business competitiveness.

LINES OF ACTION

INTRA-ENTREPRENEURSHIP

- Actions will include support for intra-entrepreneurship and the development of specialised advisory or mentoring services, both for entrepreneurs and for entrepreneurial companies and organisations that want to diversify and/or have opportunities to do so. Open innovation programme, within the WOLARIA accelerator.

SERVICES

- Support services in three phases: strategic acceleration, market acceleration (aligned with RIS3 priorities) and scaling up. As infrastructures to support the creation and consolidation of companies, the ICE business project launcher, the Bioincubator and the accelerator for companies with high growth potential will continue to be supported and provided with more services.

ENTREPRENEURIAL UNIVERSITY

- The university sector will promote the creation of knowledge-based spin-offs and the development of transformational social entrepreneurship ecosystems through the TCUE programme. This programme will be complemented, in a coordinated manner, with the ICE-University lines of collaboration.

ENTREPRENEURSHIP LINKED TO RIS3 PRIORITIES

- Entrepreneurship Support Line linked to RIS3 priorities, covering the entire life cycle from the idea, the creation of start-ups and their scaling-up phase and support for growth in markets.

RURAL ENTREPRENEURSHIP

- Entrepreneurship and the generation of economic activity in rural areas will also take on special importance in this period, where national and European policy guidelines are clearly committed to this as one of the mechanisms for tackling the demographic challenge and depopulation. In Castilla y León, furthermore, and as mentioned in the specialisation priorities, the enhancement of endogenous resources and the quality of life in rural areas are key elements in tackling territorial cohesion and generating quality employment.

2.4. Develop excellence in research and enhance knowledge transfer

The fourth strategic axis of the objective capacities focuses on an essential aspect of strengthening the Community's R&I ecosystem:

supporting excellent R&D and the transfer of knowledge and technology to business and society.

LINES OF ACTION

R&I EXCELLENCE

- Support for R&I excellence. As in the previous period, the concept of excellence has to be selective and understood as being linked to international recognition and leadership, with research activities of above world average impact. This includes support for university structures of excellence (units and centres of excellence in Castilla y León), as well as support for accredited health research institutes (e.g. IBSAL).
- As a mechanism to support and encourage excellence in research, this block also includes co-financing for Community research institutes and centres in their participation in European research programmes, as well as promotion and support for their participation in research networks and platforms.

KNOWLEDGE TRANSFER

- Promote the transfer of knowledge, reinforcing the involvement of knowledge-generating agents in the development of innovative solutions for the economy and society.
- In the business sphere, the technology transfer cheques will continue to be promoted as a mechanism to encourage smaller companies in the Community to invest in the incorporation of more advanced knowledge and technology in order to provide greater added value to their products and services.
- University-business knowledge transfer will be addressed through the TCUE programme, where it is worth highlighting the commitment to fab-labs (prototyping and digital manufacturing laboratories) as an instrument to bring research results closer to the market.
- Specific activities will be developed in the fields of health (support to translational research through SACyLINNOVA) and agri-food (through the development of the Platform for the streamlining of agricultural and agri-food research and innovation).

OBJECTIVE 3: Digital Agenda for Castilla y León

The Digital Agenda for Castilla y León is the instrument for the digital transformation of the Community, making information and communication technologies tools for social and territorial cohesion, improving the provision of public services and the innovation and competitiveness of the economy, thus achieving greater rural de-

velopment and job creation. In short, the aim is to take advantage of the benefits of digitalisation for citizens, businesses and government.

Digital transformation is a long-term process, in which our Community has already travelled a long way and in which the Agenda focuses on four main lines of action.

LINES OF ACTION

3.1. Digital connectivity and Infrastructures

Digital connectivity through telecommunications infrastructures is the necessary and essential basis for achieving the digital transformation of society and is the key for citizens and businesses to access the services and opportunities derived from it. For this reason, work will continue to ensure that the deployment of infrastructures reaches the entire territory in a uniform manner and that the existing social and geographical inequality gaps are further reduced.

It is also necessary to boost the Community's technological infrastructures in the field of supercomputing, as the development of hi-

gh-performance computing is one of the objectives in Europe given the possibilities it offers for the digital transformation of the economy and society.

LINES OF ACTION

PROMOTE THE DEPLOYMENT OF TELECOMMUNICATIONS NETWORKS AND SERVICES TO ENSURE HIGH-CAPACITY DIGITAL CONNECTIVITY THROUGHOUT THE COMMUNITY

- Collaborate with the General State Administration, the competent entity in telecommunications matters, and with the rest of the administrations, to promote the availability of high-capacity telecommunications networks throughout the Community, within the framework of the Plan for Connectivity and Digital Infrastructures. Special efforts will be made to promote the roll-out of 5G services and infrastructures, within the framework of national plans and strategies.

DEVELOP HIGH-PERFORMANCE COMPUTING CAPABILITIES AND SERVICES AND THE CAPACITY AND COVERAGE OF THE REDCAYLE NETWORK COVERAGE

- SCAYLE's infrastructures and services will be promoted as a reference centre in Castilla y León for intensive computing services and massive data analysis and storage. Work will be performed on projects based on technologies such as blockchain, to guarantee the integrity and security of transactions. Similarly, the capacity and coverage of RedCAYLE, the Community's high-capacity backbone communications network infrastructure, will be expanded to provide technological infrastructure to support universities, research centres and public administrations, among others.

3.2. Digital transformation of companies

The transformation of the companies will depend on their ability to rapidly and widely adopt new digital technologies, inter alia in their management systems, production processes, industrial and service systems.

The adoption of digital technologies by companies should be encouraged and facilitated, deployed rapidly to enable more intensive and efficient use of resources, and taking into account those with the smallest environmental footprint.

With these actions, the competitiveness of companies in Castilla y León will be improved through the digital transformation of the production model in terms of processes, services and products, with the ultimate aim of achieving economic growth and job creation, greater territorial cohesion with the development of rural areas and digital leadership.

LINES OF ACTION

DIGITALISATION OF COMPANIES

- Facilitate the digital transformation process of companies by carrying out different support actions depending on the sector, territory, size or degree of digital maturity of the companies. The key is the comprehensive accompaniment of SMEs according to their needs, from the initial diagnosis phase, to subsequently providing the necessary technological advice and facilitating their access to specialised technical knowledge and experimentation environments, which will ultimately allow them to choose the solution that best suits their needs and the line of financial support that will allow them to make the necessary investment.
- Awareness-raising, training and networking actions will be carried out with the rest of the ecosystem to complete the support for the digitalisation of companies, and mobility and cybersecurity solutions will be promoted, as well as other enabling technologies related to smart specialisation and the needs of the Community.

SECURE DIGITAL TRANSFORMATION

- Support digitalisation processes, paying special attention to the cybersecurity measures that companies need to incorporate in order to carry out their digital transformation securely, through awareness-raising initiatives, training and support for the implementation of solutions. In addition, training measures, university-business collaboration, business support and the promotion of employment and entrepreneurship in the new digital technologies and cybersecurity sector will be promoted.

BOOSTING THE DIGITAL SECTOR

- Improving the competitiveness of companies operating within the digital sector, making their products visible and facilitating their adoption by regional and national SMEs. These companies will be encouraged to continue to innovate, developing new or improved products and services by facilitating access to regional, national and European lines of financing for the sector. Technology forums and sectoral meetings will also be held to align supply and demand, make their products visible and facilitate their adoption, identify needs or market niches, and guide them towards future trends.

3.3. Digitalisation of public services

Public administrations are immersed in the same process of digital transformation that society as a whole is undergoing. This transformation has an impact on all dimensions of administrations: in terms of processes, technology and people, and will allow citizens to have customised and proactive e-services, access to public information and transparency by default and participation in the design of public services.

The application of technologies in internal processes will lead to a data-driven administration, the promotion of internal collaborative work, the intensive use of digital tools and the automation of routine tasks, resulting in greater efficiency and quality of public services. Special attention will be paid to the sustainable development of digital public services and reduction of environmental impact, aligned with the Sustainable Development Goals foreseen by the 2030 Agenda.

LINES OF ACTION

CUSTOMISATION OF DIGITAL PUBLIC SERVICES

- Work will continue on the customisation of digital public services, to make them more citizen-friendly, proactive, accessible, secure and providing multi-channel access, especially in terms of mobility. Work will focus on streamlining administrative procedures, the exchange of information between administrations and the automation of processes for end-to-end digital management.

PROMOTING THE USE OF E-ADMINISTRATION BY CITIZENS AND BUSINESSES

- The use of e-Administration will be promoted, providing the necessary help and support from the 012 Service to users of the electronic headquarters and through the digital transformation of the Citizen Service Registry Offices.

DIGITAL TRANSFORMATION OF THE PUBLIC EMPLOYEE'S WORKPLACE

- Efficient and secure digital applications and infrastructures will be provided to enable fully digital administrative activity, with an emphasis on mobile working and collaborative tools.

BOOSTING OPEN GOVERNMENT

- Greater availability of open public data will be provided for reuse by society, the business community and the Administration of the Community of Castilla y León itself, through the creation of the Data Office. Transparency will be promoted to make it easier for citizens to understand and hold the Administration accountable.

CITIZEN PARTICIPATION PORTAL

- Progress will be made in the development and improvement of the Citizen Participation Portal to facilitate collaboration and knowledge management between the Administration and citizens and to incorporate the latter in innovation processes and in the results generated from citizen participation.

DEVELOPMENT OF THE SMART TERRITORY IN CASTILLA Y LEÓN, FOR A MORE EFFICIENT MANAGEMENT AND PROVISION OF PUBLIC SERVICES BY PUBLIC ADMINISTRATIONS

- Develop the smart territory in Castilla y León through technologies such as IoT and AI, the sharing of software platforms and the support, collaboration and coordination of Local Administrations with the Administration of the Community of Castilla y León for the promotion of digital public services within the framework of the Network of Digital Municipalities.

LINES OF ACTION

DIGITALISATION OF THE HEALTHCARE SYSTEM

- Investment in technologies and infrastructures for service delivery and management, and integration of information systems in the health system from a global perspective (care and public health). Evolution of medical record and data management tools for diagnostic support, early detection of diseases and transparency; interoperability of medical records and electronic prescriptions within the European framework; corporate information systems; improved infrastructures in healthcare centres; improved connectivity of all professionals, especially in rural areas; digital transformation of patient relationship processes, including citizen information services; integration of socio-health care processes; digital transformation of health professional relationship processes, including training and knowledge management; transformation of IT governance.

DIGITALISATION OF SOCIAL SERVICES

- Digitalise social services by investing in technologies and infrastructures for the provision of services and their management, as well as in interoperability with the information systems of other entities within the Social Services system and other care systems, such as, preferably, the health system. The Digital Social History will be worked on. In particular, advanced telecare will be promoted, through predictive and proactive services, based on risk and emergency detection sensors; telemonitoring of the person's activity, monitoring and accompaniment of the person from a distance, through technological devices (robots), for home automation control and accessibility of environments, facilitating tasks with smart support products. The online connection with the citizen will be favoured through a custom digitalised space (with access to all their articular information) for each social services user.

DIGITALISATION OF THE EDUCATIONAL SYSTEM

- Advance towards digital excellence, with the aim of achieving an educational model based on ICTs, by improving infrastructures and new equipment in line with the classrooms of the future, supporting the most needy families to eliminate the digital divide, developing digital educational content, promoting digital curricular content, digitalising school libraries in Castilla y León and applying Artificial Intelligence to the educational system.
- Progress will be made in the comprehensive online management of the educational community, at administrative and educational levels, through the provision of new electronic services and the integration and standardisation of the information and management systems of the educational centres with the corporate virtual platform.
- In the university sphere, open university repositories of open data and access to open publications -open science- will be promoted, as well as a single access for researchers to all documentation and procedures related to R&D&I activity, making it visible to society as a whole through the Science and Research Portal. In addition, the INFRARED web portal for networked scientific and technological equipment will be enhanced to optimise the use of equipment by the research and economic sectors.

ADVANCING IN THE DIGITALISATION OF THE CULTURAL HERITAGE OF CASTILLA Y LEÓN

- Advance in the digitalisation of cultural heritage, especially through its monitoring by means of IoT technologies and support for projects involving its digitalisation for archaeological research, documentation, digital conservation management, digitalisation of the value chain and remote protection of assets by means of sensorisation.

DIGITALISATION OF THE NATURAL AND FORESTRY HERITAGE OF CASTILLA Y LEÓN

- Advance in the knowledge of natural and forestry heritage, improving biodiversity and habitat inventory systems, implementing continuous forest inventory, implementation and integration of remote sensing. Full digitalisation of the planning and monitoring of interventions, including forest fire fighting, providing safety for all members of the operation. Digitalisation of actions and implementation of digital traceability in the various value chains. Digitalisation of forestry administrative procedures.

DIGITALISATION IN TOURISM

- Digitalisation of the tourist offer; digitalisation of tourist information offices, museums and other resources.
- Promote and encourage tourism demand, as well as increase accessibility, by means of technologies and the promotion of smart destinations in Castilla y León.

3.4. Digital skills

This strategic axis will equip all citizens with the digital skills needed to function effectively and responsibly in the digital context.

This axis will be developed by supporting training in basic digital skills, with special attention to disadvantaged groups, promoting the acquisition of more advanced digital skills and lifelong digital learning among the active popu-

lation (unemployed and workers) and citizens as a whole to adapt to the new demands of digital profiles in the labour market.

Digital skills will continue to be promoted in education, encouraging technological vocations from an early age, as well as raising awareness and training entrepreneurs and small businesses in digital skills.

LINES OF ACTION

IMPROVING BASIC AND INTERMEDIATE DIGITAL SKILLS AMONG CITIZENS

- Improving basic and intermediate digital skills, especially for those groups with greater difficulties, so that they can learn to cope and gain confidence, improving their quality of life and gaining full participation in the digital age. To this end, awareness-raising actions, personalised advice and technological training aligned with the European Digital Skills Framework (DigComp) will be strengthened, aimed at both end users and intermediary agents (human resources, third sector, employment counsellors, social workers, etc.). Personalised digital profiles will be drawn up, attending to the specific needs of each group.
- Media literacy and cybersecurity actions will be carried out to promote a critical and responsible use of technology. Lifelong digital learning will be promoted through online training formats that improve the user experience (MOOC courses, m-learning, etc.) as well as the open availability of an online catalogue of self-training content. The CyL Digital Spaces and associated digital skills centres will be promoted in rural areas, as well as the figure of the public digital mediator to facilitate access, technological advice and support for citizens in the use of technology and digital services.
- Demonstrators of emerging technologies will be set up to disseminate their use among citizens (3D printing, IoT, AI, VR, etc.) and social innovation and citizen participation projects will be promoted through living labs for the design and co-creation of solutions with the application of ICTs.

BOOSTING DIGITAL SKILLS FOR BETTER EMPLOYMENT

- Promote digital skills to improve employment, through specialised training in digital skills for young people, workers and unemployed people, both through vocational training and employment services, or any other body with responsibilities for improving business competitiveness, by retraining professional profiles to meet the new demands of the market and promoting training in advanced technologies geared to the digital professions of the future.

LINES OF ACTION

FOSTERING DIGITAL COMPETENCES OF COMPANIES

- Fostering the digital competences of companies, improving their competitiveness on the basis of professional and personal development of talent. To this end, awareness-raising and training actions aimed at entrepreneurs, the self-employed and SMEs are proposed to guide them and help them to carry out an effective digital transformation in their businesses. Cultural change in companies will be promoted through flexible digital training programmes aimed at executive decision-makers within the company, as well as the development of programmes to qualify and reinforce the digital skills of company employees. These actions will be supported by digital transformation agents within companies.

FOSTERING DIGITAL COMPETENCES IN THE EDUCATIONAL SPHERE

- Foster digital skills in education and the promotion of STEM technological vocations, with special attention to the gender perspective, through the implementation of digital plans in all educational centres (CoDiCe ICT model), which will involve teacher training and capacity building, awareness-raising actions, advice and training for families on digital security and confidence, and training in digital skills for pupils throughout the various educational stages.

PROMOTION OF THE DIGITAL SKILLS AMONG PUBLIC EMPLOYEES OF THE ADMINISTRATION OF THE COMMUNITY OF CASTILLA Y LEÓN

- Promote the digital skills of public employees through awareness-raising actions, the development of a specific digital skills training plan and the promotion of the certification of public employees' digital skills. The digital skills of public employees in local administrations will be enhanced.

DEVELOPMENT AND PROMOTION OF THE CERTIFICATION OF DIGITAL COMPETENCES IN LINE WITH THE EUROPEAN DIGCOMP FRAMEWORK

- Develop and promote the certification of digital competences so that citizens can accredit their level of digital competence and have it recognised by public administrations and the private sector. The number of certifying centres will be increased, the online certification modality will be promoted, collaboration agreements will be established with key agents in the field of education, employment and companies to promote it, as well as with other Public Administrations for its recognition and standardisation outside the Community of Castilla y León. Efforts will be made to achieve compatibility with the future European Digital Skills Certificate (EDSC).

OBJECTIVE 4: Strengthening participatory governance for specialisation

One of the main challenges of smart specialisation strategies, for the 2021-2027 period, is to strengthen participatory governance for the development of smart specialisation by maintaining a continuous process of entrepreneurial opportunity discovery (Entrepreneurial Discovery Process, EDP). The aim is to maintain a mechanism of coordination and collaboration between all the agents of the science and technology system, with an impact on the economy and society of Castilla y León.

The Entrepreneurial discovery process is mainly through two mechanisms:

EDP for the development of transformative **challenges**.

EDP in the **strategic management** of specialisation.

LINES OF ACTION

4.1. EDP for the development of transformative challenges

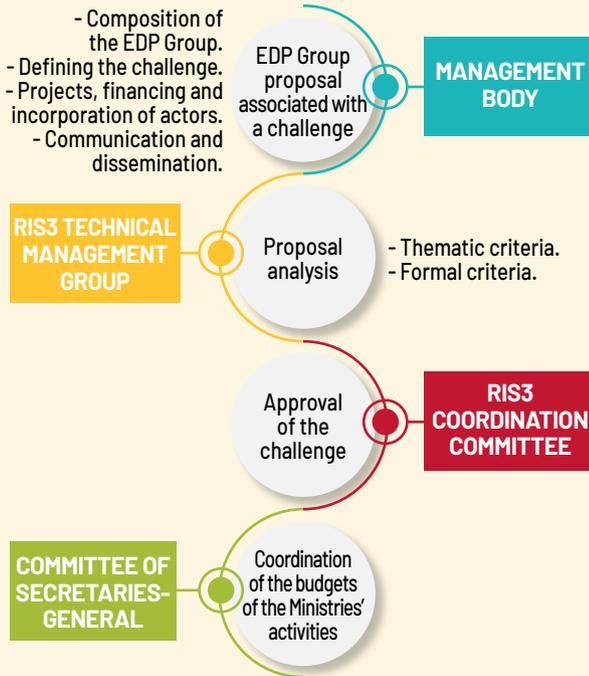
Transformative challenges will be developed through the implementation of EDP Groups.

The proposal of the different EDP Groups for the development of transformative challenges will respond to the criteria established in axis 1.2 *Develop the system of support for transformative challenges for the economy and society of Castilla y León*, with at least the following contents:

CONTENTS OF THE EDP GROUP PROPOSAL FOR THE DEVELOPMENT OF A CHALLENGE

- 1.- Composition of the members of the consortium developing the challenge:
 - ➔ Leader (promoter): Directorate General or management centre of the Administration of the Community of Castilla y León.
 - ➔ Coordination: Company, company representative, social representative (depending on the subject matter).
 - ➔ Participating actors.
- 2.- Concrete definition of the transformative challenge.
- 3.- Identification of projects for their development, detailing objectives, indicators and timetable for implementation.
- 4.- Funding for the development of the projects:
 - ➔ Funding Regional Government of Castilla y León.
 - ➔ National/international R&I programmes.
 - ➔ Mobilisation of private resources.
- 5.- Process of incorporating new agents into the consortium.
- 6.- Communication and dissemination actions.

The process of setting up these EDP groups will be as follows:



It will be a Directorate General or management centre of the Administration of the Community of Castilla y León that requests the implementation of a transformative challenge, and to this end, the proposal of the EDP Group for its implementation.

The necessary thematic and formal criteria will be justified in the proposal.

The Technical Management Group will analyse the proposal and will verify compliance with both thematic and formal criteria for approval.

The RIS3 Coordination Committee will approve the challenge, in such a way as to ensure alignment not only with RIS3, but also with the Community's economic and social development policies, with an integrated and comprehensive vision.

Once the challenge has been approved, the leader (promoter) will ensure its continued operation and carry out the monitoring and evaluation tasks, supported by the participating actors.

In order to guarantee the correct functioning of the EDP Group and to ensure that the process is continuous over time, a common working methodology will be used, which will be defined by the RIS3 Technical Management Group with the support of the Commissioner for Science and Technology.

Participants should bring together research, technological development, prototyping and validation capabilities in real conditions for the solutions to be developed, as well as financing experts. The consortium will provide mechanisms to bring in new participants.

The transformative challenge will have to be coordinated in budgetary terms by the Committee of Secretaries-General.

The termination or modification of the EDP groups will follow the same process as their creation, at the request of the Directorate General or management centre of the Administration of the Regional Government of Castilla y León leading (promoting) the transformative challenge.

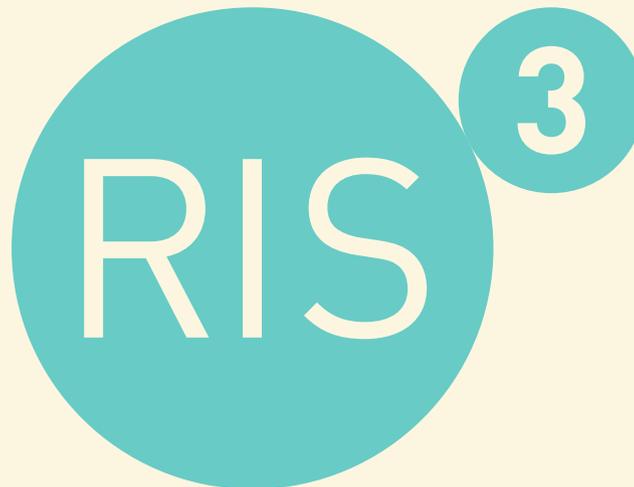
4.2. EDP in the strategic management of specialisation

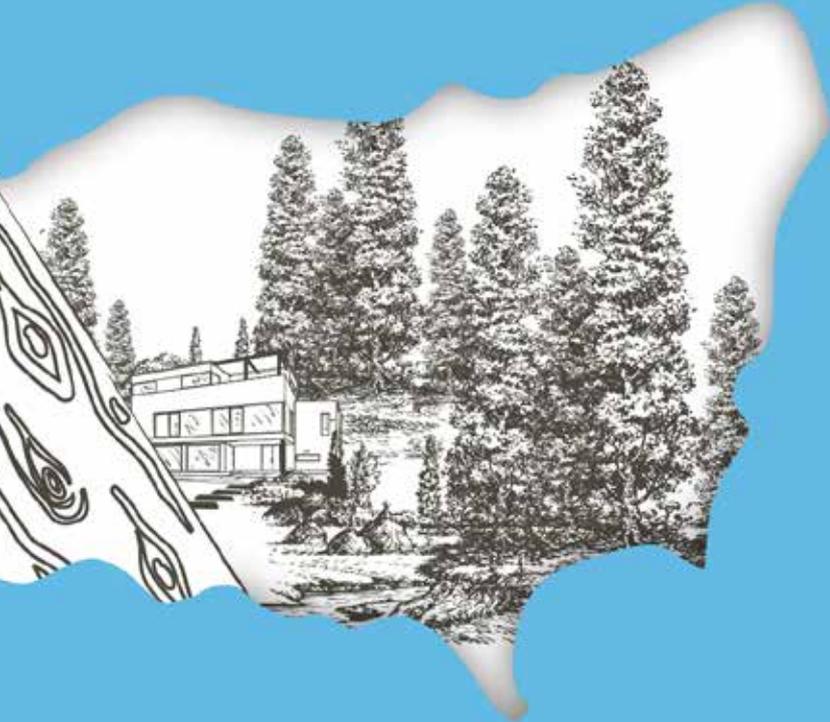
One of the strengths in the preparation of the RIS3 2021-2027 of Castilla y León has been the high and continuous participation throughout the process of the agents of the quadruple helix of innovation: companies and business representatives, knowledge-generating centres (technology centres, research centres and universities), public administration at all levels, as well as society.

To ensure that this participation continues over time and that the strategy can advance in the development of its objectives, the entrepreneurial discovery process (EDP) must be

extended, beyond the development of specific challenges, to the participatory governance of the specialisation process, articulated through sectoral roundtables and working groups dedicated to participation in the definition and review of regional priorities, the identification of strategic opportunities for the future for these priorities, as well as the establishment of recommendations for the improvement of RIS3 instruments and actions.

To reinforce their impact, these EDP groups are integrated into the RIS3 2021-2027 management structures. ●





2.4 Management, monitoring and evaluation

The management of the RIS3 of Castilla y León for the 2021-2027 period includes structures, processes and working methodologies that will enable the coordination of actions, the alignment of policies and instruments both at Community level and at national and European level, monitoring of the implementation and the results obtained, as well as making the most appropriate decisions in each case, with the aim of ensuring the achievement of the objectives set out in the context of the strategy.

The aim will be to seek to consolidate the governance model of the previous period, focusing on greater interdepartmental and inter-institutional coordination and collaboration.

The management model of the RIS3 of Castilla y León for the 2021-2027 period is reinforced in the following aspects:

The expansion of the RIS3 Technical Management Group, with a greater number of agents of the Regional Government of Castilla y León involved in the development of R&I and Digital Agenda policies.

The creation of an RIS3 Coordination Committee, made up of the Deputy Ministers and other senior officials of the Regional Government of Castilla y León, which will ensure the alignment of the RIS3 and the sectoral and horizontal plans in which it is developed and take an active part in the approval of flagship initiatives and transformative challenge.

The Entrepreneurial Discovery Process (EDP) working groups are incorporated into the RIS3 management structures.

2.4.1 Coordination, management and participation structure

According to Law 17/2002 on the Promotion and General Coordination of Scientific Research, Development and Technological Innovation in Castilla y León, the Regional Government of Castilla y León is responsible for leading the implementation of the smart specialisation strategy and is responsible for its approval and accountability to the Regional Parliament of the Community.

The management and implementation of the RIS3 corresponds to the different bodies of the Administration of the Regional Government of Castilla y León, which, in turn and within the framework of their competences, can draw up sectoral and/or action plans, where the aspects linked to R&I and digitalisation are aligned with what is established in this smart specialisation strategy. The Commission of Secretaries-General is responsible for coordinating the R&I and digitalisation activities of the different Regional Ministries of the Regional Government of Castilla y León within the framework of the RIS3.

The RIS3 Coordination Committee is made up of deputy ministers of the Regional Govern-

ment of Castilla y León from areas related to science and technology, as well as general directors of areas not included in any of the deputy ministries. This committee is responsible for reviewing, approving and making proposals for improvements to the RIS3 strategic planning.

The RIS3 Technical Management Group, made up of technicians appointed by the management centres of the Regional Government of Castilla y León, with responsibility for the implementation of the different axes and lines of action of the Strategy, is maintained and broadened in terms of participation.

As mentioned above, the Commissioner for Science and Technology of Castilla y León will be the body responsible for “ensuring the coordination and coherence of the actions carried out by the Administration of the Community of Castilla y León in the field of R&D&I and the Digital Knowledge Society”³³.

The table below lists the different bodies involved in the governance of the RIS3 strategy, as well as the specific functions of each of them:

³³ According to Decree 91/2007, of 20 September, creating the Commissioner for Science and Technology of Castilla y León.

BODY

FUNCTIONS AND RESPONSIBILITIES

REGIONAL GOVERNMENT OF CASTILLA Y LEÓN

- Approval of possible modifications and updates of the RIS3.
- Information to the Regional Parliament of Castilla y León on the monitoring and evaluation of the RIS3.
- Inclusion of RIS3 in the Community's social dialogue.
- Continuous communication to the agents of the regional innovation system and to the general public on RIS3 developments.

COMMITTEE OF SECRETARIES-GENERAL

- Ensure that the objectives and priorities of the R&I policy are met.
- Ensure compliance with the conditions favourable to the ERDF.
- Coordinate the activities of the different ministries in the field of R&I.
- Carry out the appropriate planning and coordination, as well as proposing the economic and budgetary actions that will allow to meet them.
- Approval of possible modifications and updates of the RIS3.
- Submit to the Regional Government of Castilla y León the RIS3 monitoring reports, as well as the conclusions and recommendations deemed necessary for the fulfilment of the objectives.
- Where appropriate, allocation of resources to flagship initiatives and transformative challenges.

RIS3 COORDINATION COMMITTEE

- Propose modifications and updates to the RIS3, both from a technical and budgetary point of view and in terms of implementation planning.
- Propose concrete actions, approve Flagship Initiatives and transformative challenges.
- Ensure the alignment of RIS3 and sectoral or horizontal development plans or programmes, within the scope of their competences.
- Analyse and assess the RIS3 monitoring reports, with a view to making proposals for improvement in terms of coordination between regional ministries in their respective R&D&I actions.
- Supervise the development of the RIS3 Communication Plan.

COMMISSIONER FOR SCIENCE AND TECHNOLOGY

- Ensure the coordination and coherence of RIS3 actions in the field of R&I.
- Ensure, in collaboration with the competent Regional Ministry of Finance, compliance with the budget forecasts derived from the RIS3.
- Promote and coordinate the participation of all the agents involved in the regional system of science, technology, business and society.
- Supervision of the working methodology and streamlining of the entrepreneurial discovery groups and consensus on the results of the work.
- Coordinate the preparation of the annual RIS3 action reports.
- Act, whenever possible, as representative of the Community of Castilla y León in relation to the transversal policy on science, technology and innovation before other bodies and institutions.

RIS3 TECHNICAL MANAGEMENT GROUP 2021-2027

- Coordinate at a technical level the various action plans of the ministries, in order to avoid duplication and take advantage of synergies and complementarities.
- Promote the connection and complementarity of the actions of the different competent bodies of the Administration of the Community of Castilla y León with the General State Administration, Horizon Europe, the European Green Pact and all those programmes and instruments supporting R&I and the Digital Agenda.
- Exchange of experiences and dissemination of good practices in horizontal aspects of policy implementation: evaluation and monitoring, gender mainstreaming, sustainability, contribution to sustainable development goals, etc.
- Carry out quantification and monitoring of RIS3 indicators.
- Identify possibilities for establishing partnership agreements with other regions of interest, in the context of regional priorities, in order to improve public policies and to leverage inter-regional investments.
- Technical analysis of proposals for flagship initiatives and transformative projects.
- Drafting and updating of the RIS3 Management Guide.
- Supervise the development of the RIS3 Communication Plan.

EDP WORKING GROUPS

- Participate in the definition and review of regional priorities and in the identification of new strategic opportunities for the competitive development of the Community, contributing to specialisation and structural change towards a more advanced, smart and sustainable economy.
- Establish recommendations for the improvement of RIS3 instruments and actions.
- Identify policy instruments in the context of regional priorities and identified areas of opportunity.

RIS3 Management Guide

The RIS3 management guide is a complementary document to the strategic planning, which includes the details of specific actions, the management centres that develop them, the catalogue of performance and results indicators, the guidelines for the collection of information and preparation of work plans and annual reports, the detailed description of the fulfilment of enabling conditions, the application mechanisms, approval and development of emblematic initiatives and transformative challenges arising from the EDP process, the communication plan to bring the vision and contents of the RIS3 closer to society, knowledge agents and companies in the Community, as well as the possibilities of becoming involved in governance, the details regarding the integration of gender mainstreaming in the actions, the contribution to the sustainable development objectives of the 2030 Agenda, as well as the mechanisms for learning and improvement in the design of actions.

This guide will be prepared by the RIS3 Technical Management Group, under the coordination of the Commissioner for Science and Technology of Castilla y León.



2.4.2 Monitoring and evaluation

The monitoring process of the RIS3 2021-2027 will be based on the preparation of annual reports, with a view to gathering information and analysing the actions implemented and assessing the degree of compliance with the RIS3 objectives, in order to support decision-making to maximise its effectiveness and efficiency in its implementation.

The office of the Commissioner for Science and Technology will be responsible for coordinating the preparation of the RIS3 annual report, with the active participation and collaboration of the members of the Technical Management Group, responsible for the implementation of RIS3 actions.

The RIS3 Coordination Committee will be the body responsible for ensuring the alignment of the RIS3 and the sectoral or horizontal plans developed within the scope of its competences. Analyse and assess the RIS3 monitoring reports, with a view to making proposals for improvement in terms of coordination between regional ministries in their respective R&D&I and digitalisation actions.

The Commission of Secretaries-General will submit to the Regional Government of Castilla y

León the Strategy monitoring reports, as well as the conclusions and recommendations deemed necessary for the fulfilment of the objectives.

Likewise, linked to the interest in citizen participation and the necessary institutional transparency, the RIS3 annual reports will be accessible through the science and technology portal of the Regional Government of Castilla y León. A scoreboard, as presented in the following section, will be used to monitor RIS3.

With regard to evaluation, this should make it possible to assess the adequate fulfilment of objectives, introduce improvements to achieve the goals set and avoid deviations between what was planned and what was executed, thus contributing to improvements in decision-making and accountability.

The specific aspects to be included in the evaluation of the RIS3 2021-2027 will be carried out in accordance with the regulations in force at the time of its preparation, although an interim evaluation is planned for 2024 and a final evaluation once the smart specialisation strategy has been finalised.

Scorecard

In order to monitor and evaluate the RIS3 2021-2027, a scorecard is proposed that includes both the strategic level and the more operational level of the Strategy.

The main guidelines for the development of the scoreboard have been the use of indicators that are useful, reliable, accessible, easy to interpret and comparable, and preferably from official sources.

The system proposed for RIS3 consists of the following blocks of indicators:

✧ Context indicators that measure the evolution of the entire science and technology system of Castilla y León as a whole and that have implications for science, the economy and society.

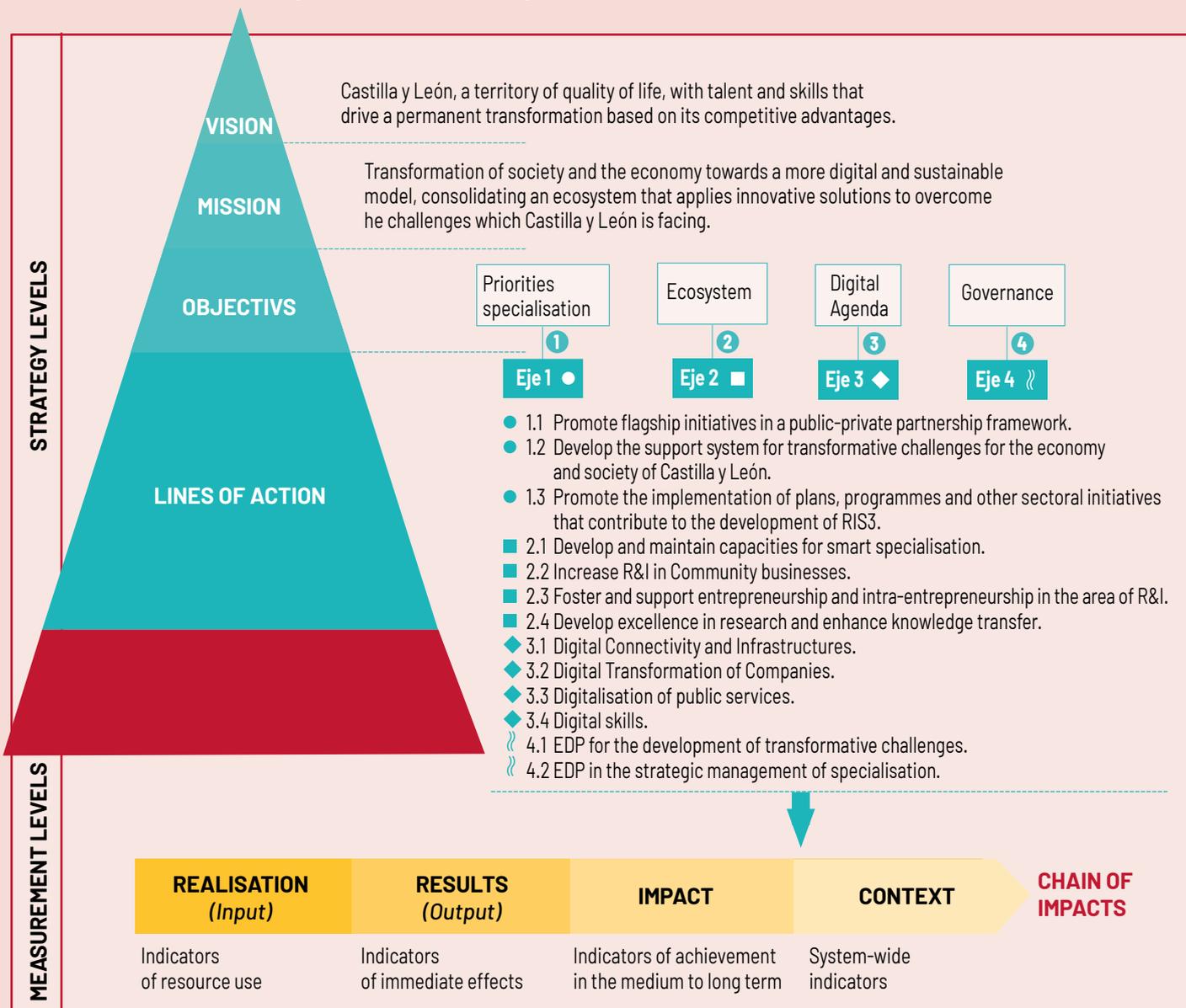
✧ Impact indicators, which measure the achievements in the medium and long term of the actions developed during the implementation of the Strategy.

✧ Output indicators for the actions, which measure the direct and immediate effects of the actions carried out. These indicators shall be selected from those proposed in Appendix I to Regulation (EU) 2021/1058, of 24 June, on the European Regional Development Fund and the Cohesion Fund, which may be supplemented by indicators specifically designed for each action.

✧ Performance indicators (input) for the actions, which measure the degree of utilisation of the resources allocated to the actions. These indicators shall be selected from those proposed in Appendix I to Regulation (EU) 2021/1058, of 24 June, on the European Regional Development Fund and the Cohesion Fund, which may be supplemented by indicators specifically designed for each action.

These blocks of indicators are related to each other through the intervention logic of the

specialisation strategy, as shown in the diagram below:



Context indicators

The context indicators for the RIS3 objectives have a reference value, corresponding to the latest data available before the RIS3 was launched, and target values for 2024 and 2027.

They are indicators provided by official sources, and are therefore standardised, comparable and stable. They are shown in the table below:

TABLE 7. CONTEXT INDICATORS

CONTEXT INDICATORS						
INDICATOR	RIS3 OBJECTIVE	SOURCE OF INFORMATION	REFERENCE VALUE		2024 OBJECTIVE	2027 OBJECTIVE
			YEAR	DATA		
% exports of products with higher technological content as a percentage of total exports	Objective 1	DATAKOMEX	2019	61.08%	65.00%	70.00%
R&D expenditure/GDP	Objective 2	INE	2019	1.35%	1.70%	2.12%
R&D expenditure executed by businesses	Objective 2	INE	2019	65.30%	67.50%	70.00%
% innovative businesses	Objective 2	INE	2019	17.40%	21.00%	25.00%
Employment in high-tech sectors	Objective 2	EUROSTAT	2020	2.50%	2.75%	3.00%
Percentage of accumulated return of the Horizon Europe programme over the total for Spain	Objective 2	CDTI	2019	2.50%	2.75%	3.00%
Normalised impact of the scientific production of Castilla y León	Objective 2	SCOPUS	2019	1.18%	1.22%	1.25
Percentage of researchers in the private sector	Objective 2	INE	2019	32.77%	35%	38%
Population coverage with more than 100 Mbps.	Objective 3	SETELECO	2020	74%	91%	100%
Companies with 10 or more employees that have an Internet connection and a website	Objective 3	INE	2020	73.2%	78%	83%
Companies using the Internet to interact with public administrations (<10 employees)	Objective 3	INE	2020	73.37%	79%	85%
People who have interacted with public administrations via the Internet in the last 12 months	Objective 3	INE	2020	67.5%	71%	75%
People with basic digital skills	Objective 3	INE	2020	58.5%	70%	80%

These indicators may be supplemented by specifically designed indicators, which will be used throughout the life of the strategy.

Impact indicators

The RIS3 Technical Management Group will select the indicators that enable to know the use of the results of the actions in the medium and long term.

These indicators will be included in the RIS3 management guide.



Output and action performance indicators

The RIS3 Technical Management Group will select the indicators necessary for the correct monitoring of its actions from among the indicators proposed in Appendix I of Regulation (EU) 2021/1058, of 24 June, on the European Regional Development Fund and the Cohesion Fund.

The indicators selected for the same action must be maintained throughout the duration of the action and will be reflected in the successive RIS3 annual action reports.

They will have targets set for 2024 and 2027. These milestones will be defined by the Technical Management Group once the ERDF Operational Programme for Castilla y León 2021-2027 is approved.

For the performance indicators, their reference value will be zero and they will be cumulative once the different actions of the Strategy have been implemented.

The performance and result indicators that complete the monitoring and evaluation system of the Strategy's actions will be incorporated into the RIS3 Management Guide. ●



2.5 Financial plan

The resources mobilised for the implementation of the Castilla y León Smart Specialisation Strategy 2021-2027 will be the result of a combination of public and private funding.

On the one hand, the Regional Government of Castilla y León will invest the amounts earmarked for science and technology in the successive General Budgets of the Community of Castilla y León for the years 2022-2027.

On the other hand, RIS3 will stimulate the participation of the agents of the science and technology system (companies, universities, research centres, technology centres, *clusters*, etc.) in funding R&D&I and digitalisation programmes from other local, national and international public administrations, such as the

successive state plans for scientific, technical and innovation research, or European Union programmes (Horizon Europe programme, European Structural and Investment Funds, *InvestEU* Innovation Fund, Digital Europe programme, etc.), all aimed at making a significant contribution to science and technology policy guidelines in the 2021-2027 period.

Finally, the funding of the Strategy through the resources devoted by companies and other private organisations to R&D&I and Digital Agenda activities is relevant.

The following table shows all the economic resources that are expected to be mobilised throughout the implementation of the RIS3 of Castilla y León 2021-2027.

TABLE 8. BUDGETARY GUIDELINE

BUDGETARY GUIDELINE 2021-2027 (MILLION EUROS)	2021	2022	2023	2024	2025	2026	2027	TOTAL
PUBLIC RESOURCES	660	706	728	756	777	799	824	5,251
Regional Government of Castilla y León	480	513	529	549	565	581	599	3,816
Other public resources	180	193	199	207	212	218	225	1,435
PRIVATE RESOURCES	1,167	1,249	1,286	1,336	1,374	1,412	1,457	9,281
TOTAL	1,827	1,955	2,014	2,092	2,151	2,211	2,281	14,532

The amount of mobilised resources foreseen may be revised as a result of the mid-term evaluation of the Strategy, in order to make a more precise estimate for the 2025-2027 period. ●

The amount of mobilised resources foreseen may be revised as a result of the mid-term evaluation of the Strategy, in order to make a more precise estimate for the 2025-2027 period. ●

Acronyms

5G	Fifth generation mobile network.	PISA	Programme for International Student Assessment.
CENIEH	National Centre for Research on Human Evolution.	SME	Small and medium-sized enterprises.
CLPU	Pulsed Laser Centre.	REDCAyLE	Castilla y León Science and Technology Network.
DigComp	European Digital Competence framework for citizens.	RIS3	Research and Innovation Strategies for Smart Specialisation.
FECYT	Spanish Foundation for Science and Technology.	RV	Virtual reality.
ERDF	European Regional Development Fund.	SACYLINOVA	Innovation Support Unit of the Regional Health Management of Castilla y León.
IA	Artificial Intelligence.	SCAYLE	Supercomputing of Castilla y León.
R&D+i	Research, technological development and innovation.	STEM	Science, Technology, Engineering and Mathematics.
R&I	Research and innovation.	TARIC	The TARIC nomenclature is the nomenclature used for the tariff classification of goods at European Community level.
IESCYL	Institute of Health Science Studies of Castilla y León.	TCUE	University-business knowledge transfer network.
INFRARED	Networked University Infrastructure Programme.	ICT	Information and communication technologies.
IoT	Internet of Things.	TIMMS	Trends in International Mathematics and Science Study.
JCYL	Regional Government of Castilla y León.	TRL	Technology Readiness Level.
OCDE	Organisation for economic cooperation and development.	EU28 (EU27)	28 EU countries (until the UK's exit in 2020). EU27 refers to the countries of the European Union since the departure of the United Kingdom.
EDP	Entrepreneurial discovery process, understood as a participatory process of discovering business opportunities.		
GDP	Gross domestic product.		





**Junta de
Castilla y León**