Digital Economy and Society Index (DESI) 2021

Spain

About the DESI

The European Commission has monitored Member States' progress on digital and published annual Digital Economy and Society Index (DESI) reports since 2014. Each year, the reports include country profiles, which help Member States identify areas for priority action, and thematic chapters providing an EU-level analysis in the key digital policy areas.

In 2021, the Commission adjusted DESI to reflect the two major policy initiatives that will have an impact on digital transformation in the EU over the coming years: the Recovery and Resilience Facility and the Digital Decade Compass.

To align DESI with the four cardinal points and the targets under the Digital Compass, to improve the methodology and take account of the latest technological and policy developments, the Commission made a number of changes to the 2021 edition of the DESI. The indicators are now structured around the four main areas in the Digital Compass, replacing the previous five-dimension structure. 11 of the DESI 2021 indicators measure targets set in the Digital Compass. In future, the DESI will be aligned even more closely with the Digital Compass to ensure that all targets are discussed in the reports.
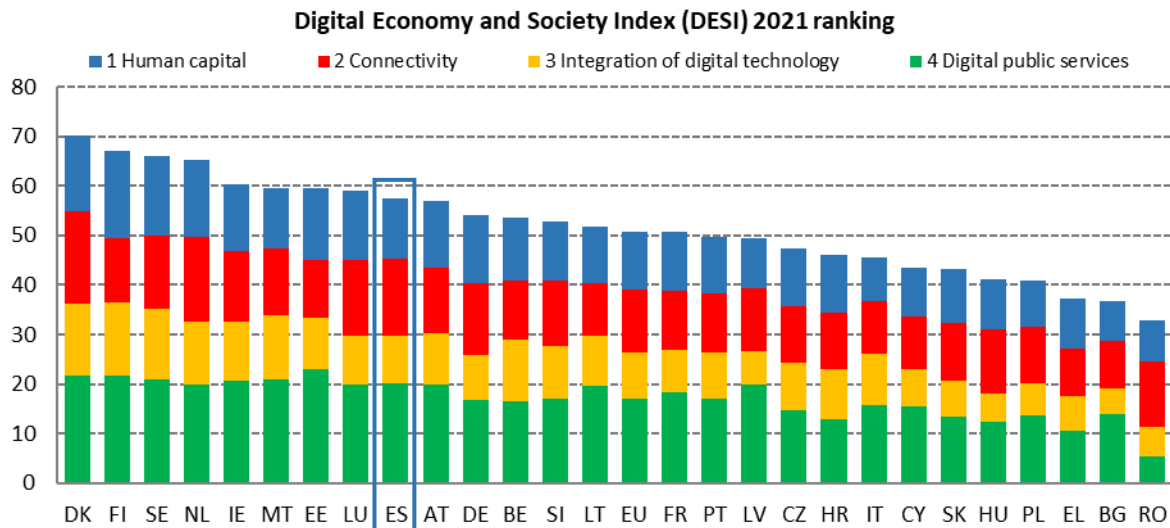
In addition, DESI now includes an indicator measuring the level of support that adopted ICT technologies provided companies in taking more environmentally-friendly measures (ICT for environmental sustainability) and the take up of gigabit services, plus the percentage of companies offering ICT training and using e-invoicing.

The DESI scores and rankings of previous years were re-calculated for all countries to reflect the changes in the choice of indicators and corrections made to the underlying data.

For further information, see the DESI website: https://digital-strategy.ec.europa.eu/en/policies/desi.

Overview

	Spain		EU
	rank	score	score
DESI 2021	9	57.4	50.7

Digital Economy and Society Index (DESI) 2021 ranking

- 1 Human capital
- 2 Connectivity
- 3 Integration of digital technology
- 4 Digital public services

Spain ranks 9th among the 27 EU Member States in the European Commission's 2021 edition of the Digital Economy and Society Index (DESI). Spain is a strong performer in Digital public services thanks to the digital-by-default strategy throughout its central public administration. Spain also performs very well in Connectivity, although gaps between urban and rural areas remain. On Human capital, Spain ranks 12th and has been improving over the last few years, but there is still room for progress, especially on the Information and Communication Technologies (ICT) specialist indicator. Spain ranks 16th on the integration of digital technologies; its score is in line with the EU average and the increase in Small and Medium-size Enterprises (SMEs) selling online is significant. However, enterprises are not yet taking sufficient advantage of new technologies such as Artificial Intelligence (AI), big data and cloud, which could help further develop productivity and e-commerce. In 2020, Spain adopted a new and ambitious digital agenda, Digital Spain 2025[1], to promote Spain's digital transformation through a set of reforms up to 2025, as well as significant public and private investment. Additional specific plans have been launched under the agenda in areas such as human capital, connectivity, and digitalisation of business.

A National Digital Competences Plan[2] was presented in early 2021, which includes an exhaustive set of measures to strengthen digital skills among the workforce and citizens in general. Spain is currently a medium performer on the human capital dimension and this strategy will help its population to make better use of the opportunities provided by the digital economy and society.

Spain performs very well in Connectivity and has improved considerably in fibre deployment, but the wide digital gap between urban and rural areas remains. Improved coverage would also support the digital transition of the Spanish farming sector and allow it to better monitor and optimise agricultural
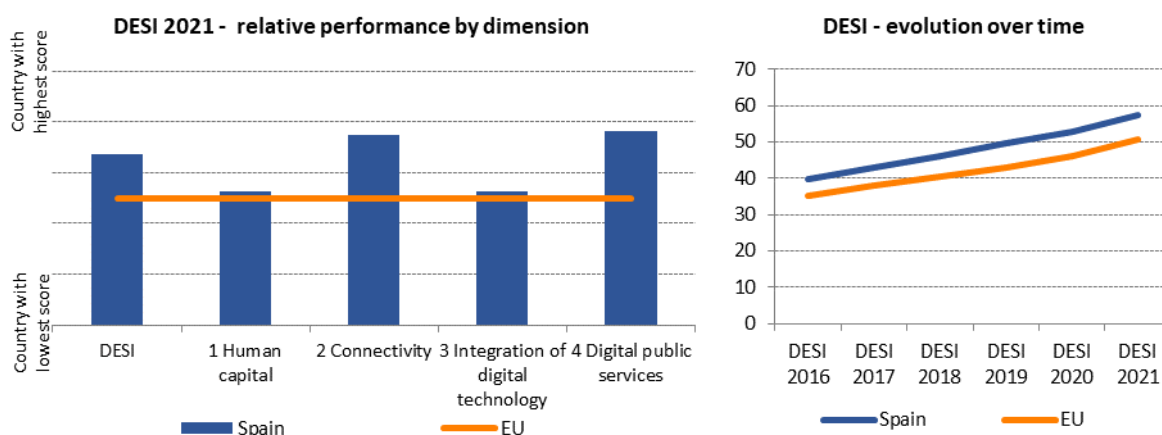
---

[1]https://portal.mineco.gob.es/RecursosArticulo/mineco/ministerio/ficheros/210204_Digital_Spain_2025.pdf
[2] https://portal.mineco.gob.es/RecursosArticulo/mineco/ministerio/ficheros/210902-digital-skills-plan.pdf

production. In 2020, Spain launched the Strategy for the promotion of 5G[3] to improve spectrum assignment and management across pioneer bands and incentivise 5G deployment and use. Spain's Connectivity Toolbox roadmap includes several measures to reduce the cost of deploying broadband.

On the Integration of digital technologies by business, Spanish businesses are still not taking full advantage of the online economy and SMEs are lagging behind on digitalisation. Digital transformation and the uptake or deployment of emerging technologies can boost the innovative capacity of the Spanish economy, driven by SMEs; in 2021, Spain launched the SME Digitalisation Plan 2021-2025[4] to boost disruptive innovations and entrepreneurship in digital. The country also launched a National Strategy for AI[5], and participates in significant large-scale European projects. In addition, Spain has adopted an ambitious digitalisation plan for SMEs, has boosted digital skills in education and employment, and has usefully prioritised RRF funding for that purpose with a strong set of coherent support actions.

Spain performs very well in e-government and continues to make progress with new developments, e.g. defining a reference framework to manage identification[6] and cooperating with Germany on building an ecosystem of digital identities, including a cross-border pilot and an information exchange in the area of self-sovereign identity[7]. In 2020, Spain adopted a specific plan for the digitalisation of its public administration[8] and a law on electronic trust services, and created the Data Office Division. In 2021, it also approved the Regulation of action and operation of the public sector by online communication.

DESI 2021 - relative performance by dimension

DESI - evolution over time

---

[3] https://portal.mineco.gob.es/RecursosArticulo/mineco/ministerio/ficheros/210204_Strategy_for_the_promotion_of_5G.pdf

[4] https://portal.mineco.gob.es/RecursosArticulo/mineco/ministerio/ficheros/210902-digitalisation-smes-plan.pdf

[5] https://portal.mineco.gob.es/RecursosArticulo/mineco/ministerio/ficheros/201202_ENIA_V1_0.pdf

[6] https://www.boe.es/boe/dias/2021/01/11/pdfs/BOE-A-2021-413.pdf

[7] https://portal.mineco.gob.es/es-es/comunicacion/Paginas/210729_np_ecosistema.aspx

[8] https://portal.mineco.gob.es/RecursosArticulo/mineco/ministerio/ficheros/210902-digitalisation-of-public-admin-plan.pdf

Digital in Spain's Recovery and Resilience Plan (RRP)

Spain's RRP, with a total budget of up to EUR 69.5 billion, contains an ambitious set of reforms and investments in digital. The RRP devotes 28.2% of the total investment to digital (exceeding the 20% target) with a total amount of EUR 19.6 billion.

There is a particular focus on promoting the digitalisation of businesses, including SMEs (25% of the total digital budget), strengthening the digital skills of the Spanish population (22%), improving digital connectivity in the whole of the country (15%), continuing the digitalisation of the public administration (28%), and supporting digital-related R&D and the deployment of digital technologies (10%).

The plan includes actions to further digitalise industries and business, with a specific focus on Spanish SMEs and micro-enterprises, to help them in the transition towards the digitalisation of productive processes and distribution channels.

To improve the population's digital skills, the RRP foresees specific measures to support the digitalisation of the education system, ambitious programmes to upskill and reskill the workforce, and specific initiatives to develop advanced digital skills in key technologies such as AI.

Despite being among the top performers in the EU in terms of Very High Capacity Networks (VHCN), Spain's RRP includes significant investments to close the existing digital divide between urban and rural areas in fixed and mobile broadband networks. Several measures specifically support 5G connectivity and the plan includes reforms to reduce costs and facilitate deployment.

There are also substantial investments to promote the digitalisation of the public administration and of the National Health Service and simplify public interactions with businesses and people in Spain.

The plan includes participation into Multi-Country Projects (MCP), including the Important Project of Common European Interest (IPCEI) on Microelectronics and Communication Technologies, the IPCEI Next Generation Cloud Infrastructure and Services, 5G corridors, and the Genome of Europe. In addition, Spain's RRP includes investments that are aligned to other European projects such as: High Performance Computing (HPC), EuroQCI (quantum computing and quantum information), digital innovation hubs, and cybersecurity operation centres.

1 Human capital

1 Human capital	Spain		EU
	rank	score	score
DESI 2021	12	48.3	47.1

Human capital
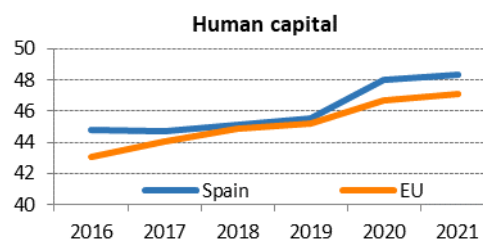
	Spain			EU
	DESI 2019	DESI 2020	DESI 2021	DESI 2021
1a1 At least basic digital skills % individuals	**55%** 2017	**57%** 2019	**57%** 2019	**56%** 2019
1a2 Above basic digital skills % individuals	**32%** 2017	**36%** 2019	**36%** 2019	**31%** 2019
1a3 At least basic software skills % individuals	**58%** 2017	**59%** 2019	**59%** 2019	**58%** 2019
1b1 ICT specialists % individuals in employment aged 15-74	**3.5%** 2018	**3.6%** 2019	**3.8%** 2020	**4.3%** 2020
1b2 Female ICT specialists % ICT specialists	**18%** 2018	**20%** 2019	**20%** 2020	**19%** 2020
1b3 Enterprises providing ICT training % enterprises	**21%** 2018	**22%** 2019	**20%** 2020	**20%** 2020
1b4 ICT graduates % graduates	**4.0%** 2017	**3.9%** 2018	**4.2%** 2019	**3.9%** 2019

On Human capital, Spain ranks 12th among the 27 EU countries. 57% of the people in Spain have at least basic digital skills, just above the EU average but still far from the target of 80% of the European population with at least basic digital skills by 2030[9]. In addition, 36% of the Spanish labour force still do not have basic digital skills[10], hampering further digitalisation of businesses and uptake of advanced digital technologies. The proportion of ICT specialists increased to 3.8% of total employment in 2020; in 2018, the share of ICT specialists accounted for 3.5%. Despite some progress, the shortage of ICT specialists is still a productivity constraining factor, especially for SMEs. The gender imbalance remains significant and female specialists only account for 20% of all ICT specialists (just above the EU average of 19%).

Supporting the digital skills of its population is among the 10 priorities of Spain's digital strategy, Digital Spain 2025[11]. This strategy acknowledges that the lack of digital skills, both basic and advanced, hampers the country's digital transformation. In early 2021, a specific National Digital Competences Plan[12] was adopted. To reach ambitious targets, in line with those set in the Digital Decade Communication for basic digital skills and ICT specialists, the strategy for digital skills contains seven action lines: 1) digital skills training, with special emphasis on population groups at risk of digital exclusion; 2) bridging the digital gender divide; 3) digitalising the education system and developing digital skills for learning; 4) digital skills training throughout working life (focusing on the working population in the private sector and the unemployed); 5) digital skills training for public sector

---

[9] Target defined in the European Pillar of Social Rights action plan.
[10] Data from Digital Agenda Key Indicators: https://bit.ly/3qJ6pkZ
[11] https://portal.mineco.gob.es/RecursosArticulo/mineco/ministerio/ficheros/210204_Digital_Spain_2025.pdf
[12] https://portal.mineco.gob.es/RecursosArticulo/mineco/ministerio/ficheros/210902-digital-skills-plan.pdf

workers; 6) digital skills training for SMEs; 7) increasing the supply of ICT specialists (via vocational training and university education).

This plan is an essential instrument in promoting digital skills development in Spain. It will be critical for the acquisition of digital skills by people in Spain in general, and by workers and ICT professionals in particular. The strategy as a whole will benefit from a total investment of EUR 3.75 billion.

The Educa en Digital programme[13], presented in June 2020, includes actions to foster further digitalisation of the Spanish education system, therefore promoting greater social inclusion. It has supported: the completion of a high-speed connectivity programme in public schools; provision of equipment for the most vulnerable people; and the modification of basic legislation on education, assigning a more relevant role to digitalisation in educational centres, both in the learning process and in the curriculum. In addition, amid the COVID-19 pandemic, the government launched a package of emergency actions in response to difficulties in distance teaching, making online training tools and open educational resources available to the educational community. It included actions to foster further digitalisation of the Spanish education system, thereby further supporting social inclusion.

Actions to upskill and reskill the Spanish workforce and tackle the existing shortage of ICT specialists in Spain are also ongoing. Multiple initiatives have been developed, including ones to promote the needs of SMEs, such as Digital Talent, or Digital Professionals, an initiative providing training and facilitating job placements in those areas where advanced digital skills are required.

In addition to these massive investments, public-private collaboration that aims to achieve the European targets for digital skills are of fundamental importance. AMETIC, the business association of the digital industry, is running the Spanish Digital Skills & Jobs Coalition[14], encompassing more than 150 organisations (companies, public administrations, training centres and universities) active in promoting digital skills in Spain. In May 2021, the coalition launched the Spanish Digital Skills & Jobs Platform, which is connected to the European platform[15], as the one-stop-shop for information on digital skills and training materials in the Spanish context. AMETIC will also actively participate in the recently created Hub for Digital Skills, a public-private institutional associative body which will guide the implementation of the Spanish RRP and its actions for digital skills.

During the 2020 edition of Code Week, 1,126 events were organised in Spain; it attracted 90,469 participants, 43% of whom were women, and 57% of the activities were organised in schools.

The Talento Hacker initiative was launched in April 2021. This free cybersecurity training initiative, which aims to promote cybersecurity learning among different types of audiences, attracted a total of 1,258 teams and 437 individual registrations (5,341 participants) in its first edition.

Overall, sound implementation of the new plan and investments will most likely bring a lasting impact for the people in Spain and the country's economy. In a more digitalised society, focusing on the groups among the population that are the least likely to use digital technologies and boosting the participation of women in the digital economy will enable everybody to make the most of Spain's digital transformation. The special attention given to the upskilling and reskilling of the labour force, in both the public and private sectors, will allow Spain to tap into the potential of the digital economy, and therefore contribute to a robust recovery.

---

[13] https://www.educacionyfp.gob.es/en/prensa/actualidad/2020/06/20200616-educaendigital.html
[14] https://ametic.es/en/prensa/ametic-lanza-la-web-digital-skills-and-jobs-coalition-spain-para-mejorar-las-competencias
[15] https://digital-skills-jobs.europa.eu/en/about/national-coalitions/spain-digital-skills-and-jobs-coalition

## Human Capital in Spain's Recovery and Resilience Plan

In Spain's RRP, the entirety of Component 19 - Digital Skills (EUR 3.59 billion) and parts of five other components support the acquisition of digital skills. This wide set of measures includes actions for specific groups and areas such as education, Vocational Education and Training (VET), the public sector and SMEs.

The main actions envisaged in the RRP are:

- The National Digital Competences Plan, which will act as a road map to identify and enact the necessary measures to ensure access and development of digital skills for all people in Spain.
- Transversal digital skills programmes, including: 1) development of a network of digital training support centres; 2) specific e-inclusion actions; 3) awareness-raising campaigns; 4) activities to increase digital skills of people in Spain in general; and 5) digital resources to disseminating and teaching Spainsh (EUR 735 million).
- Digital transformation of education, including 1) access to digital learning through the provison of electronic divises to students from vulnerable groups and an interactive digital system (IDS); and 2) a digital VET plan (EUR 1,412 million).
- Digital skills for employment by: 1) strengthening existing active labour market policies for skills and requalification, targeting employed and unemployed persons; 2) a digital training programme for public administrations; and 3) a programme for digital transformation and training in digital skills for SMEs (EUR 1,256 million).
- Investments for digital professionals, adapting the existing vocational training offer on advanced digital skills, and attracting and retaining talent in those fields (EUR 190 million).

2 Connectivity

2 Connectivity	Spain		EU
	rank	score	score
DESI 2021	**3**	**62.0**	**50.2**

Connectivity
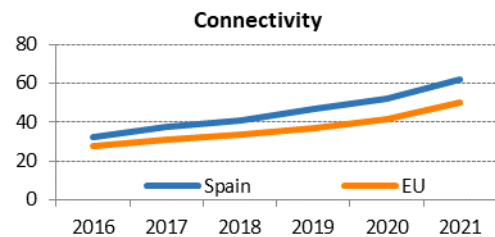
	Spain			EU
	DESI 2019	**DESI 2020**	**DESI 2021**	**DESI 2021**
2a1 Overall fixed broadband take-up % households	**77%** 2018	**78%** 2019	**82%** 2020	**77%** 2020
2a2 At least 100 Mbps fixed broadband take-up % households	**30%** 2018	**53%** 2019	**65%** 2020	**34%** 2020
2a3 At least 1 Gbps take-up % households	**NA**	**<0.01%** 2019	**<0.01%** 2020	**1.3%** 2020
2b1 Fast broadband (NGA) coverage % households	**88%** 2018	**90%** 2019	**92%** 2020	**87%** 2020
2b2 Fixed Very High Capacity Network (VHCN) coverage % households	**77%** 2018	**89%** 2019	**92%** 2020	**59%** 2020
2c1 4G coverage % populated areas	**99.5%** 2018	**99.8%** 2019	**99.9%** 2020	**99.7%** 2020
2c2 5G readiness Assigned spectrum as a % of total harmonised 5G spectrum	**30%** 2019	**30%** 2020	**65%** 2021	**51%** 2021
2c3 5G coverage % populated areas	**NA**	**NA**	**13%** 2020	**14%** 2020
2c4 Mobile broadband take-up % individuals	**80%** 2018	**86%** 2019	**86%** 2019	**71%** 2019
2d1 Broadband price index Score (0-100)	**NA**	**52** 2019	**73** 2020	**69** 2020

Spain's already high connectivity score has improved further, moving the country up to 3rd place in the EU. Spain performs particularly well in Very High Capacity Network (VHCN) coverage, as persistent gaps between urban and rural areas are starting to close.

Thanks to extensive fibre to the premises (FTTP) deployment, fixed VHCN covered 92% of households in 2020 (3 p.p. above the previous year) and well above the EU average (59%). The increase is sharpest in rural areas, where 64% of households are covered by fixed VHCN (12 p.p. above the previous year). NGA networks covered 92% of households, also above the EU average (87%). Overall fixed broadband take-up increased by 4 p.p., from 78% in 2019 to 82% in 2020. At least 100 Mbps broadband take-up increased from 53% to 65%, to almost double the EU average (34%) in 2020.

While Spain's 5G readiness stagnated at 30% of harmonised spectrum assigned, 5G networks covered 13% of households by June 2020, 1 p.p. below the EU average (14%). Spain published a new connectivity plan and 5G strategy[16] in December 2020 that aims to cover 100% of the population with more than 100 Mbps by 2025, in line with EU targets, and focusing on rural areas. The roadmap to implement the Connectivity Toolbox[17] includes several measures with the potential to reduce costs.

---

[16] https://portal.mineco.gob.es/es-es/comunicacion/Paginas/201201_np_conectividad.aspx
[17] https://digital-strategy.ec.europa.eu/en/library/connectivity-toolbox-member-states-develop-and-share-roadmaps-toolbox-implementation

The main measures include streamlining permit granting procedures, improving the single information point and increasing the transparency of physical infrastructure.

The national programme for the extension of next generation broadband networks (PEBA-NGA)[18], co-financed by the European Regional Development Funds (ERDF), has continued to finance the roll-out of NGA networks in rural and less populated areas. In 2020, there was an adjustment of the ERDF, releasing all the amounts not committed or in the process of being committed, to cover urgent needs derived from the COVID-19 pandemic (EUR 94 million for the PEBA-NGA programme). The 2021 PEBA-NGA call aims to distribute EUR 38.76 million to broadband extension projects in 12 provinces.

In 2020, Spain released a Strategy for the promotion of 5G[19] to improve spectrum assignment and management across pioneer bands, and to incentivise the deployment and use of 5G.

As of May 2021, the 3.4-3.8 GHz band was the only assigned 5G pioneer band in Spain (95% of the band). Spain is in the process of migrating the radars in the 3.4-3.8 GHz band and began the refarming process to allow for larger contiguous amounts of spectrum by 2021 or the beginning of 2022[20].

After delays due to the COVID-19 pandemic, the government published the auction for the 700 MHz band[21] on 31 May 2021, which was completed on 21 July 2021. Operators are experimenting with using the 26 GHz band, but the band assignment is expected for the second half of 2022.

By Royal Decree 7/2021[22] of 27 April 2021, Spain makes it possible to extend the duration of individual rights of use for radio spectrum from 20 to 40 years for new assignments. The four largest mobile operators have launched commercial 5G services and have announced plans to continue deploying 5G in the main cities. Moreover, operators are involved in several trials, some subsidised by the government, to test support for connectivity-intensive applications.

Market and Regulatory Developments

Telefónica, Orange and Vodafone continue to dominate the Spanish broadband market, despite the decrease in their joint share of fixed broadband lines (from 85% to 82%) between Q4 2019 and Q4 2020. This is due to gains made by MasMovil and Euskaltel, which held over 12% and 4% of the market in Q4 2020, respectively. Euskaltel reached several wholesale access agreements to provide services beyond northern Spain under its new nationwide brand, Virgin Telco. On 28 March 2021, MasMovil[23] announced a takeover bid[24] for Euskaltel. In January 2021, Telefónica announced the sale of its tower division, Telxius[25], to American Towers Corporation (ATC).

In 2020, 97.1% of broadband residential lines and 95.8% of broadband business lines were retailed as part of a bundle. Fixed mobile convergent bundles (6.5 million of 4P and 6.2 million of 5P) account for more than 80% of the fixed broadband market.

---

[18] http://www.mincotur.gob.es/PortalAyudas/banda-ancha/Paginas/Index.aspx
[19] https://portal.mineco.gob.es/RecursosNoticia/mineco/prensa/noticias/2020/201201_np_impulso5G.pdf
[20] https://www.boe.es/buscar/doc.php?id=BOE-A-2020-8286
[21] https://www.lamoncloa.gob.es/serviciosdeprensa/notasprensa/asuntos-economicos/Paginas/2021/310521-despliegue_5g.aspx
[22] https://www.boe.es/diario_boe/txt.php?id=BOE-A-2021-6872
[23] https://www.grupomasmovil.com/wp-content/uploads/2021/03/Ndp_MASMOVIL_Euskaltel.pdf
[24] CNMC unconditionally cleared this bid in June 2021.
[25] The sale was confirmed on 1 June 2021.

On May 5 2021, MasMovil announced it was selling its majority stake in the FTTH network to Onivia[26] (owned by the investment funds Macquarie, Aberdeen and Daiwa). The market share of wholesale-only operators is increasing, though it is not very representative.

The transposition of the European Electronic Communications Code has been delayed and the Commission has sent Spain a letter of formal notice. To address the delay, Spain intends to fast-track the General Telecommunications Law that is currently in progress, the final approval of which is expected only by Q2 2022.

In 2020, Spain's national regulatory authority, Comisión Nacional de los Mercados y la Competencia (CNMC), adopted two decisions to update the economic replicability test for Telefónica's broadband products in the residential segment[27]. The second decision led to a 5% decrease in the price of Telefónica's fibre services (NEBA local and NEBA fibre). On 13 May 2021, CNMC approved the Resolution reducing monthly capacity-based prices for Telefónica's wholesale indirect access broadband services (NEBA) by 21.2% until the end of 2021 and by another 11.7% starting in 2022[28]. On 23 April 2021, CNMC notified reduced prices for access to Telefónica's civil infrastructure wholesale offer regarding manholes and conduits (MARCo)[29].

In the fourth review of the wholesale local access market (market 1/2020, formerly 3a/2014) and wholesale central access market (market 3b/2014), CNMC proposed to increase from 66 to 624 the number of municipalities (corresponding to approximately 70% of the Spanish population) where Telefónica is not obliged to provide access to its fibre network.

On 22 December 2020, CNMC opened a public consultation on the fourth review of market 4/2014[30] (currently market 2/2020). As Telefónica continues to have significant market power, the regulator proposes to maintain most of the current obligations.

Due to the COVID-19 pandemic, CNMC had to delay by several months the dates for the planned copper phase-out in 569 main distribution frame (MDF) sites with a switch-off date in 2020[31].

Spain reported a 13% decrease in consumer complaints in 2020. The main sources of complaints were pricing and billing (36.1%), followed by contract termination (22%).

The Ministry asked operators to modify their zero rating offers to comply with the European Union Court of Justice judgment from 15 September 2020[32].

The legislation on access to 112 services is currently under review and Advance Mobile Location (AML) deployment is in progress. In January 2020, the Spanish Ministry of the Interior deployed an emergency app (Alertcops App) with location and chat functions promoting equivalent access for end users with disabilities[33].

Spain continues to be among the top performers in the roll-out of fixed VHC networks and take-up of ultra-fast broadband connections (>100 Mbps). An ambitious national connectivity plan promises to tackle persistent gaps between urban and rural areas and a complementary 5G strategy has been put forward to accelerate 5G deployment. Delayed spectrum assignment has been the biggest barrier to

---

[26] https://www.reuters.com/article/spain-masmovil-onivia-idUSL8N2MS6H3
[27] https://www.cnmc.es/node/385225
[28] https://www.cnmc.es/expedientes/ofedtsa00520
[29] https://www.cnmc.es/consultas-publicas/telecomunicaciones/consulta-publica-precios-oferta-marco
[30] https://www.cnmc.es/prensa/consulta-publica-mercado-4-empresarial-cnmc-20201222
[31] By June 2021, more than 700 sites had already been decommissioned and the current switch-off schedule includes more than 3,000 sites.
[32] https://curia.europa.eu/jcms/upload/docs/application/pdf/2020-09/cp200106en.pdf
[33] https://alertcops.ses.mir.es/mialertcops/en/index.html

5G deployment in Spain, but a reorganisation of the 3.4-3.8 GHz band and the recently completed auction of the 700 MHz band are likely to increase the country's 5G readiness within the year.

### Connectivity in Spain's Recovery and Resilience Plan

Component 15 of Spain's RRP is dedicated to supporting the digital connectivity of the country and related uptake. This component contains an ambitious set of reforms and investments in connectivity in general, and 5G in particular, aligned with the digital connectivity and infrastructure plan and with EU targets.

Some of the main reforms and investments set out within the plan on connectivity and 5G are:

- Reforms to the telecommunications regulatory framework and implementation of the 5G roadmap, assigned to digital public services in Spain's plan, including measures on managing and assigning spectrum, reducing burdens on deployment and support for local authorities.
- Promoting territorial cohesion through ultra-fast broadband connectivity (above 100 Mbps) to those areas, mainly rural areas and areas of historical value, which currently do not have such connectivity (EUR 812 million).
- Strengthening connectivity in centres of reference, socio-economic drivers and sectoral digitalisation projects (EUR 480 million), through specific actions including: 1) measures to enhance connectivity in focal points and public services; and 2) measures providing gigabit connectivity and support for some key sectors.
- Infrastructure renewal and sustainability, by improving equipment that enables optimal deployment of VHCN in existing buildings and optimising the deployment of NGA networks in a sustainable way (EUR 80 million).
- 5G networks deployment, technological change and innovation (EUR 1,405 million), including actions in the following areas: 1) main transport corridors; 2) some areas not covered by obligations included in spectrum assignment procedures; 3) key economic activities and essential services; and 4) support to 5G and 6G related R&D, for innovation ecosystems and 5G cyber security ecosystems.
- The plan includes a multi-country project (MCP) to deploy the 5G network along the cross-border corridors with Portugal and France.

3 Integration of digital technology

3 Integration of digital technology	Spain		EU
	rank	**score**	**score**
DESI 2021	**16**	**38.8**	**37.6**

Integration of digital technology
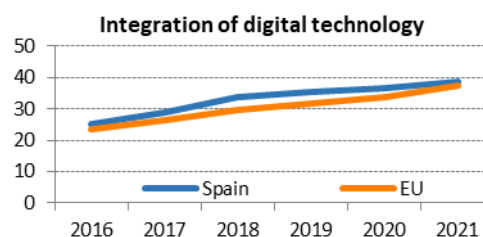
	Spain			EU
	DESI 2019	**DESI 2020**	**DESI 2021**	**DESI 2021**
3a1 SMEs with at least a basic level of digital intensity % SMEs	**NA**	**NA**	**62%** 2020	**60%** 2020
3b1 Electronic information sharing % enterprises	**46%** 2017	**43%** 2019	**43%** 2019	**36%** 2019
3b2 Social media % enterprises	**28%** 2017	**29%** 2019	**29%** 2019	**23%** 2019
3b3 Big data % enterprises	**11%** 2018	**11%** 2018	**9%** 2020	**14%** 2020
3b4 Cloud % enterprises	**16%** 2018	**16%** 2018	**22%** 2020	**26%** 2020
3b5 AI % enterprises	**NA**	**NA**	**22%** 2020	**25%** 2020
3b6 ICT for environmental sustainability % enterprises having medium/high intensity of green action through ICT	**NA**	**NA**	**76%** 2021	**66%** 2021
3b7 e-Invoices % enterprises	**33%** 2018	**33%** 2018	**33%** 2020	**32%** 2020
3c1 SMEs selling online % SMEs	**18%** 2018	**19%** 2019	**24%** 2020	**17%** 2020
3c2 e-Commerce turnover % SME turnover	**10%** 2018	**9%** 2019	**10%** 2020	**12%** 2020
3c3 Selling online cross-border % SMEs	**7%** 2017	**7%** 2019	**7%** 2019	**8%** 2019

Spain ranks 16th among EU countries for the Integration of digital technology in business. 62% of Spanish SMEs have at least a basic level of digital intensity, in line with the EU average (60%), 24% sell online (an increase of 5 p.p. compared with the previous year and 7 p.p. above the EU average), but only 7% sell across borders within the EU. 10% of SMEs' turnover is generated by online sales.

43% of Spanish enterprises have an electronic information sharing system in place (the EU average is 36%) and 29% use social media to promote their products and services (against an EU average of 23%). 22% of enterprises use cloud services (against an EU average of 26%), 22% use AI, but only 9% rely on big data analysis. 76% of enterprises have a medium or high intensity of green actions through ICT (above the EU average of 66%).

In July 2020, Spain presented its new digital strategy, Digital Spain 2025, promoting the country's digital transformation through public-private collaboration and with the participation of all economic and social agents in the country. Under this strategy, in January 2021 Spain published the SME Digitalisation Plan 2021-2025[34] to boost disruptive innovations and entrepreneurship in digital fields.

---

[34] https://portal.mineco.gob.es/RecursosArticulo/mineco/ministerio/ficheros/210902-digitalisation-smes-plan.pdf

It included five main action lines: 1) basic digitalisation for SMEs; 2) supporting the management of digital change; 3) advancing disruptive innovation and entrepreneurship; 4) supporting sectoral digitalisation, with a special focus on industry, tourism and trade; and 5) ensuring coordination and efficiency. In addition, the strategy Spain Entrepreneurial Nation[35] aims to boost Spain's business ecosystem in all sectors.

In December 2020, Spain presented a national AI strategy[36] that aims to: 1) foster scientific research, technological development and innovation in AI; 2) promote digital skills, boost national talent and attract global talent; 3) develop data platforms and technological infrastructure supporting AI; 4) integrate AI into value chains to transform the economic fabric; 5) promote the use of AI in the public administration and national strategic missions; and 6) establish an ethical and regulatory framework that ensures the protection of individual and collective rights, so as to guarantee inclusion and social welfare.

In 2021, Spain has published a call for projects that use AI to solve strategic challenges in areas such as healthcare, employment, energy, environment and agri-food[37], and has also been very active with the EuroHPC Joint Undertaking, promoting the participation of the main Spanish research institutions in its R&D calls[38]. Spain has also approved the multi-annual agreement for the HPC National Centre (BSC - CNS) for 2020-2029, reflecting a budgetary commitment to the EuroHPC Joint Undertaking of EUR 63 million, as well as the new Strategic Plan for the Spanish supercomputing network (RES) for 2021-2024.

On cybersecurity, Spain has developed a significant number of coordination measures. In 2020, it launched the National Guide to Notification and Management of Cyber Incidents, designated the National Cybersecurity Institute (INCIBE) as the National Coordination Centre, and launched the National Cybersecurity Forum and the 017 cybersecurity helpline.

Regarding data economy, cloud and edge computing, in 2020 Spain joined the GAIA-X[39] Governmental Advisory Board and is now working with the industry to create the Spanish hub of GAIA-X. This will boost the development of a data sharing ecosystem that enables entities and individuals to control access and re-use of their data[40].

Spanish businesses still have plenty of scope to take advantage of the benefits of digitalisation and new technologies, especially SMEs and micro-enterprises. The significant increase in SMEs selling online reflects the fact that consumer behaviour is changing and is more demanding as regards new online products and services. AI and other emerging technologies can act as a catalyst for SMEs to improve productivity and scalability.

> **Highlight: The role of Artificial Intelligence in Spain's digital transition**
>
> In 2020, Spain adopted a national AI strategy as part of its new digital agenda, Digital Spain 2025. This strategy aims to integrate AI into value chains and create an environment of trust around inclusive and sustainable AI.

---

[35] https://www.lamoncloa.gob.es/temas/espana-nacion-emprendedora/Documents/ENE_Resumen%20ejecutivo.pdf

[36] https://portal.mineco.gob.es/RecursosArticulo/mineco/ministerio/ficheros/201202_ENIA_V1_0.pdf

[37] https://portalayudas.mineco.gob.es/misiones-ia-2021/Paginas/Index.aspx

[38] The Agencia Estatal de Investigación is awarding grants to 17 Spanish groups participating in 10 projects approved under the EuroHPC 2019 calls, with a budget of about EUR 6 million.

[39] https://gaia-x.eu/

[40] https://portal.mineco.gob.es/es-es/ministerio/participacionpublica/consultapublica/Paginas/mdi-gaia-x.aspx

The strategy seeks to boost research and the use of reliable AI to serve economic and social development through a set of initiatives including, among others: promoting new national multidisciplinary technological development centres; and creating support programmes for companies to develop AI solutions and data.

Spain is introducing consistent, coherent measures to take advantage of AI and advanced data analysis, which are key enablers for competitiveness and successful digital transformation.

Integration of digital technology in Spain's Recovery and Resilience Plan

Spain's RRP devotes substantial investment to the digitalisation of SMEs within Component 13, but also includes several measures to foster digitalisation and the integration of digital technology in Spanish industry in general (Component 12) and the tourism sector in particular (Component 14); the RRP also promotes key technologies such as AI (Component 16). Other sectoral components often include specific measures to support the digitalisation of the sector.

Some of the most important reforms and investments relating to digitalisation of businesses are:

- Promoting digitalisation and innovation among SMEs through a set of measures to provide them with digital tools, boosting digitalisation and technological innovation. More specifically, these measures include 1) a digital toolkit, and 2) concrete programmes, namely: "Actors of Change"; "SMEs 2.0 Accelerators"; "Innovative Business Clusters Support"; and "Digital Innovation Hubs" (total budget of EUR 3.5 billion).
- Concrete investments in tourism, to promote digitalisation of tourist destinations and businesses and introduce an intelligence system based on data economy and interoperability (EUR 337 million).
- A programme to promote, modernise and digitalise the audio-visual sector (EUR 155 million).

The plan also includes measures aimed at supporting the deployment of advanced technologies that would contribute to the integration of digital technology:

- Investments to foster disruptive innovation and data spaces in strategic industrial sectors (except tourism), including agri-food, sustainable mobility, health and retail, among others (EUR 400 million).
- Investments aimed at developing the cybersecurity capacities of people in Spain, SMEs and professionals, boosting Spain's cybersecurity ecosystem as part of the European digital sovereign strategy (EUR 524 million).

As regards digital-related investment in R&D, the plan includes Spain's national AI strategy (EUR 500 million), which contains: 1) a regulatory and ethical framework; 2) R&D&I activities; 3) measures to attract talent; 4) promotion of data and technology infrastructure; and 5) integration of AI into SMEs' value chains.

Spain's RRP is very ambitious as regards participation in MCPs such as the IPCEI on Microelectronics and Communication Technologies, IPCEI Next Generation Cloud Infrastructure and Services, and the Genome of Europe. The plan includes investments that are aligned to other European projects like HPC, EuroQCI, digital innovation hubs, and cybersecurity operation centres.

4 Digital public services

4 Digital public services	Spain		EU
	rank	**score**	**score**
DESI 2021	**7**	**80.7**	**68.1**

Digital public services
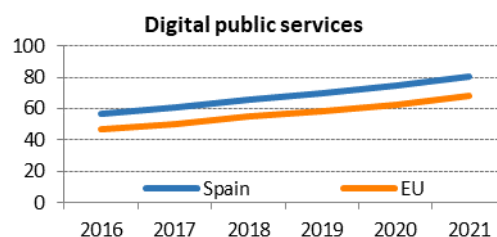
	Spain			EU
	DESI 2019	**DESI 2020**	**DESI 2021**	**DESI 2021**
4a1 e-Government users % internet users	**65%** 2018	**63%** 2019	**67%** 2020	**64%** 2020
4a2 Pre-filled forms Score (0 to 100)	**NA**	**NA**	**78** 2020	**63** 2020
4a3 Digital public services for citizens Score (0 to 100)	**NA**	**NA**	**82** 2020	**75** 2020
4a4 Digital public services for businesses Score (0 to 100)	**NA**	**NA**	**94** 2020	**84** 2020
4a5 Open data % maximum score	**NA**	**NA**	**94%** 2020	**78%** 2020

Spain ranks 7th in the EU for digital public services, well above the EU average. Indicators show a high level of online interaction between public authorities, citizens and business. 67% of Spanish online users engage actively with e-government services, compared with a 64% EU average. On the indicator for pre-filled forms (measuring the re-use of information across administrations to make life easier for individuals), Spain scored 78 points, well above the EU average of 63, even though the system in Spain works differently as it does not ask the individual for information that can be obtained through back-end structures. On digital public services for citizens, Spain scores 82 for citizens (against the EU average of 75) and 94 for business (against 84). Spain performs very well on the open data indicator, with a score of 94% (16 p.p. above the EU average).

In the Digital Spain 2025 strategy, the fifth priority is to promote the digitalisation of public administrations, which was made concrete in 2020 in a specific Plan for the Digitalisation of Spain's Public Administration[41]. This plan aims to have, at the least, 50% of all digital public services available through mobile handsets by 2025, leading towards greater personalisation and better user experience, and to increase the effectiveness, efficiency and transparency of the public sector. The plan envisages modernising the central state administration, with a specific focus on key areas such as health, justice and employment, and strengthening the digitalisation of regional and local administrations. In doing so, it aims to make the public sector a catalyst for technological innovation.

In 2020, Spain adopted a law on electronic trust services[42], repealing the previous law on electronic signature and complementing existing regulations in the field. The law recognises that some remote identification methods could offer an equivalent level of trust to physical presence and establishes a series of obligations that trust service providers must meet.

---

[41] https://portal.mineco.gob.es/RecursosArticulo/mineco/ministerio/ficheros/210902-digitalisation-of-public-admin-plan.pdf
[42] https://www.boe.es/eli/es/l/2020/11/11/6

In 2020, Spain also launched the first global standard on decentralised digital identity management, based on blockchain and distributed ledger technologies (DLT), and is cooperating with Germany on building an ecosystem of digital identities, including a cross-border pilot and an information exchange for self-sovereign identity. Findings from the pilot project could be incorporated into the upcoming toolbox to implement the European digital identity framework.

In 2021, Spain approved the regulation of the public sector's actions and operations by electronic means[43], with the aimed of improving administrative efficiency, increasing transparency and participation, guaranteeing easily usable digital services, and improving legal certainty.

Spain also created, in 2020, the Data Office Division[44] to facilitate the sharing and re-use of public data by people in Spain and enterprises, and launched the initiative 'Setting up European Blockchain Service Infrastructure (EBSI) compliant nodes and case uses in Spain' (as part of the European blockchain strategy to connect legacy/national systems to the EBSI network). Spain is at the forefront in e-government and digital public services within the EU and continues to update its services and infrastructure to respond to the rapid evolution of technology and citizens' needs. Interoperability at national, regional and local levels is now key to ensuring a smooth digital transition between administrations to achieve synergies and avoid overlaps.

Digital public services in Spain's Recovery and Resilience Plan

Digital public administration and services will be supported and driven forward through reforms and investments included in Component 11 and, partly, through many other components dealing with digitalisation of the health system; transport infrastructures and services; energy; natural resources; tourism; culture; sport; and other public and social services in general. Some of the main measures included in the plan for digital public administration are:

- Reforms to modernise and digitalise the administration in general, including specific reforms in areas such as justice and national public procurement.
- Investments to modernise the general State administration through: 1) citizen-oriented administration and improvement of interopeability and digital public services provided to citizens and businesses; 2) smart operations and data government (i.e. procurement management); and 3) digital infrastructure and cybersecurity (EUR 960 million).
- Specific measures to digitalise the central government in: 1) the health system; 2) the justice system; 3) public employment services; 4) inclusion, social security and migration; 5) consular services; and 6) pilot initiatives for security and agriculture (EUR 1,205 million).
- Investment in digital transformation and modernisation of the Ministry of Territorial Policy and the Civil Service and of the administration of the Autonomous Communities and local authorities (EUR 1,000 million).

---

[43] https://www.boe.es/eli/es/rd/2021/03/30/203
[44] https://www.boe.es/eli/es/o/2020/07/31/etd803