Annex 1: Spain’s trajectories and target values to contribute to the EU’s digital targets

Index

Section 2: Spain's trajectories and target values to contribute to the EU's digital targets.

2.1 Introduction

This annex describes the Spanish target values, which aim to be achieved at national level in 2030, and the national projected trajectories that will help meet each of the digital targets in compliance with Article 5(3) of Decision (EU) 2022/2481.

Spain maintains the values of those objectives that seek to achieve 100% of the defined units: gigabit; 5G coverage; digitization of public services for citizens and businesses; eHealth; eID. In addition, it also maintains those corresponding to the integration of advanced technologies (cloud services; big data and AI) and at least basic digital intensity of SMEs, as well as doubling the number of Unicorns.

On the other hand, Spain will drive the achievement of the EU's digital skills target by setting a higher value (85% vs. 80%). However, Spain has set a lower value for ICT specialists than Europe. The national target is 1.75 million, which would represent 8.6% of total employment in 2022. The European target is set at 20 million ICT specialists, which, if achieved, would represent 9.8% of total employment in the region.

In addition, no target is set in cases where there is no available historical data series and a clear trend defined by the Commission: Semiconductors; Edge-nodes; Number of quantum computers; eID.

To this end, national trajectories were estimated considering the historical time series of the KPIs, where data are available, and the expected impact of the policies, measures and actions included in the Spanish roadmap.

2.2 Purpose of the Spanish Digital Decade trajectories

According to Article 7 of the Decision, these national trajectories should help to achieve the European digital targets. In addition, these trajectories would serve as a basis for the Commission to monitor progress in achieving the targets.

2.3 Estimation of Spanish trajectories towards 2030

2.3.1 Methodology for estimating the Spanish Digital Decade trajectories.

The methodology for estimating the Spanish digital decade trajectories is based on that described in the "Commission Communication. Establishment of trajectories foreseen at Union level for the digital objectives".

However, to define the trajectories towards the Spain's targets, in addition to historical data (when available), the measures deployed by the country have been considered. Thus, the trajectories for achieving the Spanish targets have been modified in some cases to reflect the expected impact of the measures: Basic digital skills; ICT Specialists; Take up of digital technologies -except, big data-; Digital intensity of businesses; Unicorns; Digitalisation of public services.

2.3.2 A bird's eye view on the trajectories of the Spain's roadmap

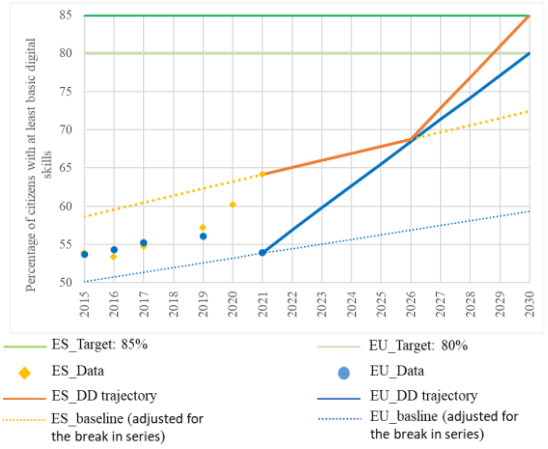
At least basic digital skills

2022 value:

- EU = 54%
- ES = 64%

2030 value:

- Target:
  - EU = 80%
  - **ES = 85%**
- Projected:
  - EU = 59%
  - ES = 72%



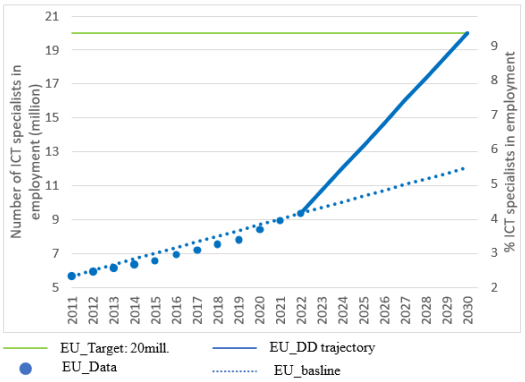
ICT specialists in employment

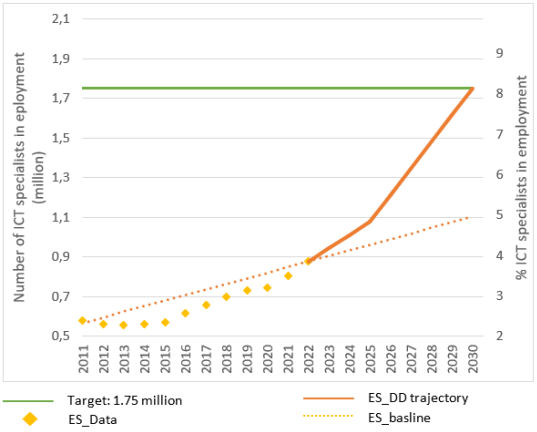
2022 value:

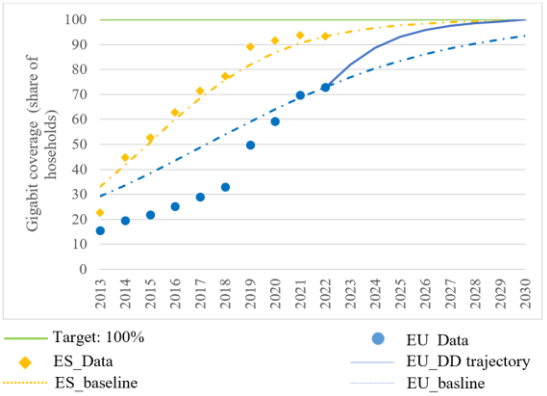
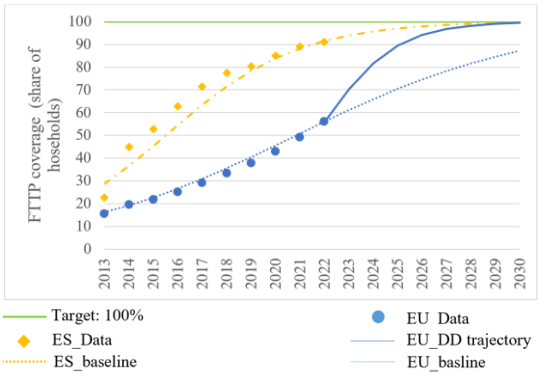
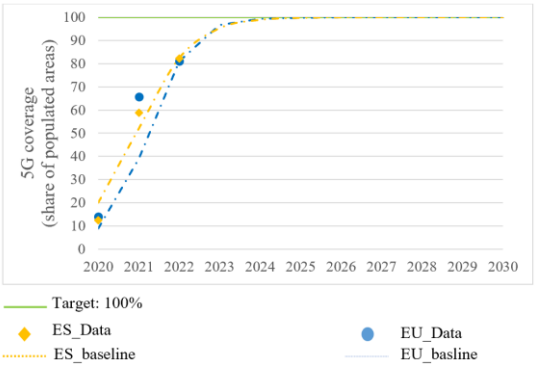
- EU = 9.37 million
- ES = 0.88 million

2030 value:

- Target:
  - EU = 20 million
  - **ES = 1.75 million**
- Projected:
  - EU = 12.0 million
  - ES = 1.1 million





Very High-Capacity Network (gigabit) 2022 value: • EU = 73% • ES = 93% 2030 value: • Target: ○ EU = 100% ○ **ES = 100%** • Projected: ○ EU = 94% ○ ES = 100%	
Fibre To the Premises (FTTP) 2022 value: • EU = 56% • ES = 91% 2030 value: • Target: ○ EU = 100% ○ **ES = 100%** • Projected: ○ EU = 87% ○ ES = 100%	
Overall 5G coverage 2022 value: • EU = 81% • ES = 82% 2030 value: • Target: ○ EU = 100% ○ **ES = 100%** • Projected: ○ EU = 100% ○ ES = 100%	

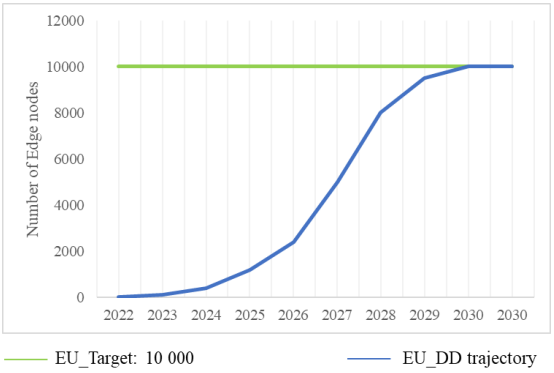
<table>
<tr>
<td>Semiconductors

2022 value:
• EU = approximately 10% of global market
• ES = N/A

2030 value:
• Target:
○ EU = 20%
○ ES = N/A
• Projected:
○ EU = N/A
○ ES = N/A</td>
<td>(EU) N/A

(ES) N/A</td>
</tr>
<tr>
<td rowspan="2">Edge-nodes

2022 value:
• EU = N/A
• ES = N/A

2030 value:
• Target:
○ EU = 10 000
○ ES = N/A
• Projected:
○ EU = N/A
○ ES = N/A</td>
<td> 
</td>
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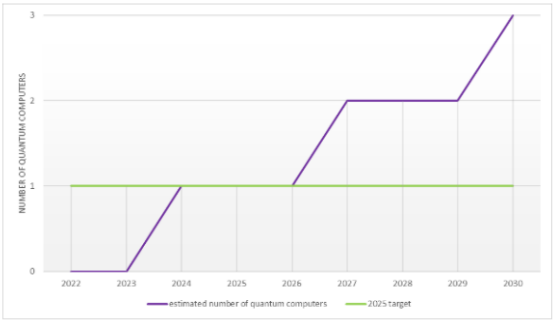
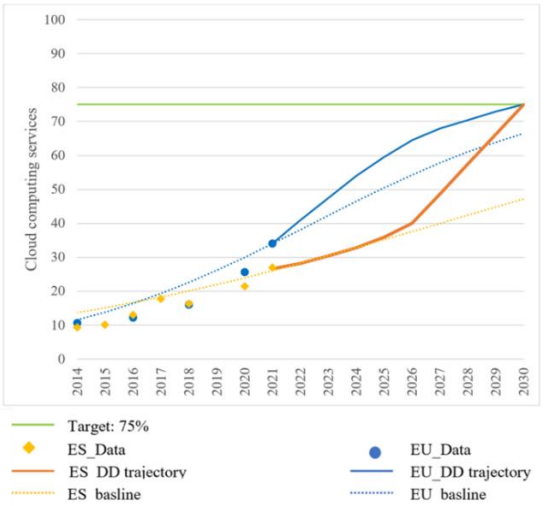
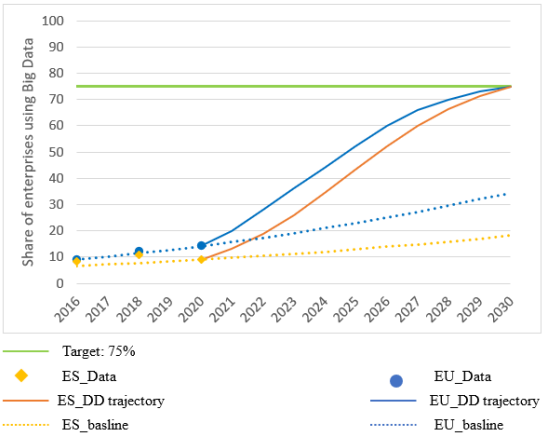
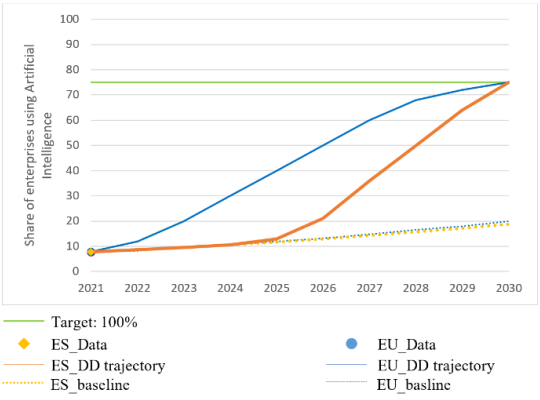
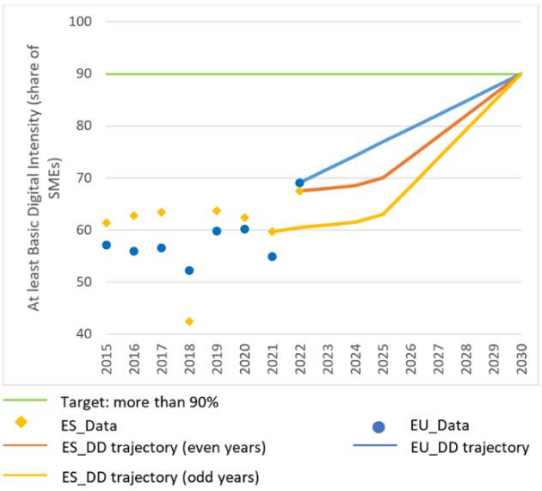
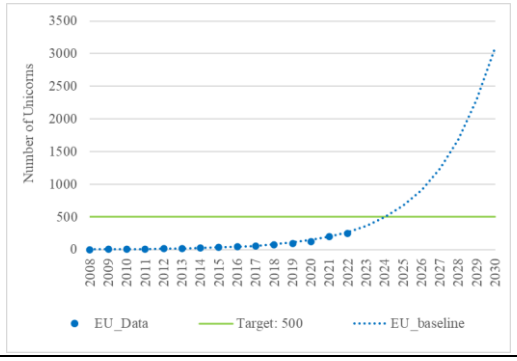
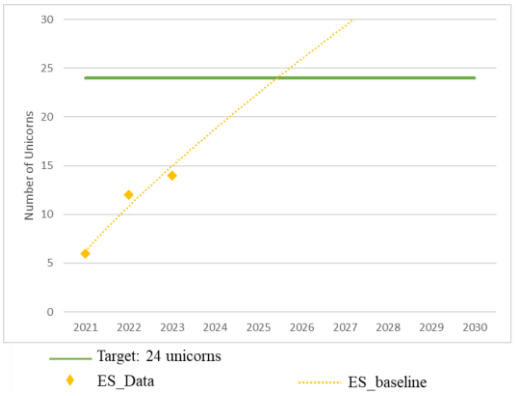
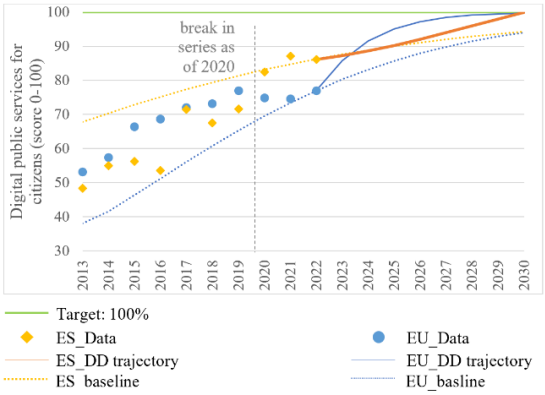
<tr>
<td>(ES) N/A</td>
</tr>
<tr>
<td rowspan="2">Number of quantum computers

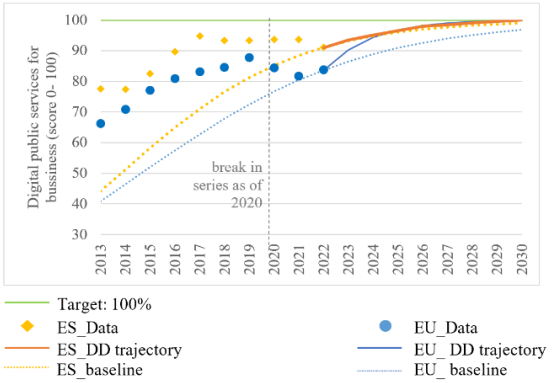
2021 value:
• EU = 0
• ES = 0

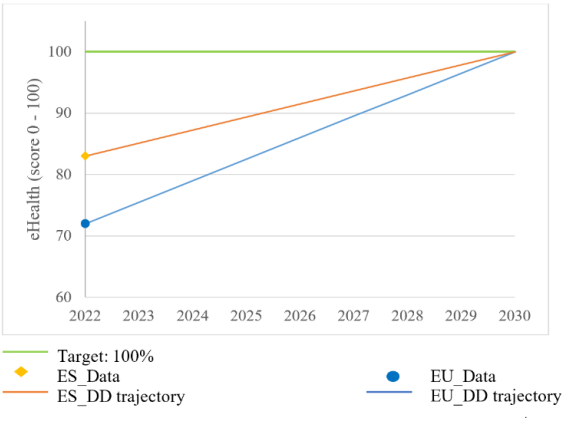
2030 value:
• Target:
○ EU = the cutting edge of quantum capabilities
○ ES = N/A
• Projected:
○ EU = N/A
○ ES = N/A</td>
<td> 

UE</td>
</tr>
<tr>
<td>(ES) N/A</td>
</tr>
</table>

Take-up of cloud services by businesses 2021 value: • EU = 34% • ES = 27% 2030 value: • Target: ○ EU = 75% ○ **ES = 75%** • Projected: ○ EU = 66% ○ ES = 47%	
Take-up of big data by businesses 2020 value: • EU = 14% • ES = 9% 2030 value: • Target: ○ EU = 75% ○ **ES = 75%** • Projected: ○ EU = 34% ○ ES = 18%	
Take-up of AI by businesses 2021 value: • EU = 8% • ES = 8% 2030 value: • Target: ○ EU = 75% ○ **ES = 75%** • Projected: ○ EU = 20% ○ ES = 19%	

SMEs with at least basic digital intensity 2022 value: • EU = 69% • ES = 68% 2030 value: • Target: ○ EU = 90% ○ **ES = 90%** • Projected: ○ UE = N/A ○ ES = N/A	
Number of Unicorns 2022 value: • EU = 249 • ES = 12 2030 value: • Target: ○ EU = 500 ○ **ES = 24** • Projected: ○ EU = > 500 ○ ES = > 24	 
Digitalisation of public services for citizens 2022 value: • EU = 77/100 • ES = 86/100 2030 value: • Target: ○ EU = 100/100 ○ **ES = 100/100** • Projected: ○ EU = 94/100 ○ ES = 94/100	

Digitalisation of public services for businesses
 	
2022 value:
• EU = 84/100
• ES = 91/100
 	
2030 value
• Target:
  ○ EU = 100/100
  ○ **ES = 100/100**
• Projected:
  ○ EU = 97/100
  ○ ES = 99/100
	

eHealth composite indicator on the availability of electronic medical data
 	
2022 value:
• EU = 72/100
• ES = 83/100
 	
2030 value:
• Target:
  ○ EU = 100/100
  ○ **ES = 100/100**
• Projected:
  ○ EU = N/A
  ○ ES = N/A
	

eID 2023 value: • EU = 21 countries with eID schemes notified • ES = Spain's ID card (DNIe) has been notified at the level of assurance "high" under the Documento Nacional de Identidad electrónico (DNIe) scheme **eWallet** The KPI follows European Digital Identity Framework.	(UE) N/A (ES) N/A

2.3.3 Spanish projected trajectories by digital target

2.3.3.1. Basic Digital Skills

***Target**: A digitally skilled population and highly skilled digital professionals, with the aim of achieving gender balance, where: **(a) at least 80 % of those aged 16-74 have at least basic digital skills**; (b) at least 20 million ICT specialists are employed within the Union, while promoting the access of women to this field and increasing the number of ICT graduates.*

***KPI definition** (referring to part (a) of the target): At least basic digital skills, measured as the percentage of individuals aged between 16 and 74 years old disaggregated by sex with "basic" or "above basic" digital skills in each of the following five dimensions: information, communication, problem solving, digital content creation and safety skills. It is measured based on the activities that individuals carried out during the previous three months; and gender convergence, measured as the percentage of women and men among those individuals with "basic" or "above basic" digital skills.*

***Source**: Eurostat, European Union Survey on ICT Usage in Households and by Individuals. (https://ec.europa.eu/eurostat/databrowser/view/isoc_sk_dskl_i21/default/table?lang=en)*

***Available data points**: 2015, 2016, 2017, 2019, 2020 (Spanish source: INE), 2021 (with a break in series in 2021).*

***Baseline value** (latest available historical data point):*
EU (2021) = 54% / ES (2021) = 64%

Spanish target: at least 85 % of those aged 16-74 have at least basic digital skills.

In 2021, 64.2% of the population had at least basic digital skills. This value is bigger than UE average (53.9%). For this reason, Spain defines its target to 2030 as 85% to contribute to achieving the EU's Digital Decade targets.

To reach 85% of people aged 16-74 with at least basic digital skills, Spain will grow at a same rate to the Spanish reference trajectory until 2025 (annual growth of 0.9 p.p.), accompanied by the deployment of measures aimed at boosting digital skills (i.e. Generation D Pact; #CompDigEdu and #EcoDigEdu programmes; and Organic Law 3/2022 of 31 March on the VET system, among others). From 2026 onwards, the most relevant impact of the measures deployed is expected to be observed, boosting the growth rate of the indicator value to reach the target set for Spain (annual growth of 4.0 p.p.).

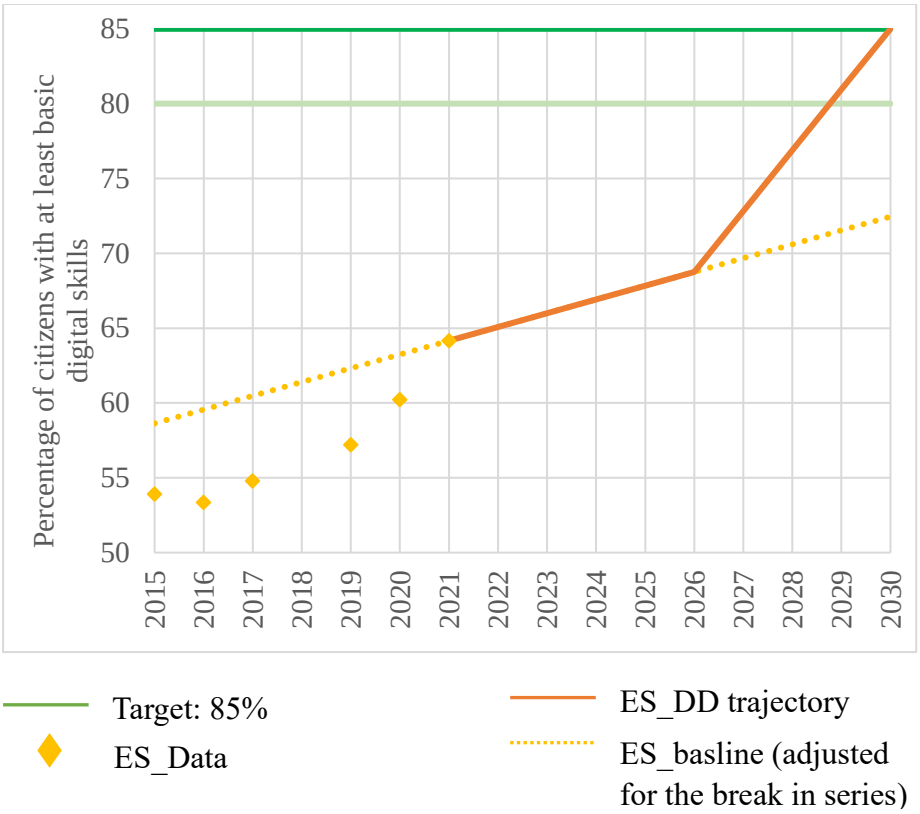


Figure 1. Basic digital skills in Spain. Historical data, Digital Decade (DD) trajectory and baseline trajectory towards 2030

	2017	2018	2019	2020	2021 *	2022	2023	2024	2025	2026	2027	2028	2029	2030
EU_Data	55.3	-	56.1	-	53.8									
EU_DD trajectory	Annual increase: 2.9p.p.					56.9	59.8	62.7	65.6	68.4	71.3	74.2	77.1	80.0
EU_baseline	51.4	52.0	52.6	53.2	53.8	54.5	55.1	55.7	56.3	56.9	57.5	58.1	58.7	59.3
ES_Data	54.8	-	57.2	60.2	64.2									
ES_DD trajectory	Annual increase (until 2025): 0.9p.p./ Annual increase (2026-30): 4.0p.p./					65.1	66.0	66.9	67.8	68.8	72.8	76.8	80.9	85.0
ES_baseline	60.5	61.4	62.4	63.2	64.2	65.1	66.0	66.9	67.8	68.8	69.7	70.6	71.5	72.4

Note*: Break in series in 2021.

Table 1. Basic digital skills in the EU and Spain. Historical data, Digital Decade (DD) trajectory and baseline trajectory towards 2030

The gap in the percentage of the population with at least basic digital skills between women and men is not very large and has decreased in recent data. The importance of integrating women into the digital transformation is recognized and with the different measures launched (i.e. Generation D Pact, CODI Program, among others) the gender gap is expected to be eliminated.

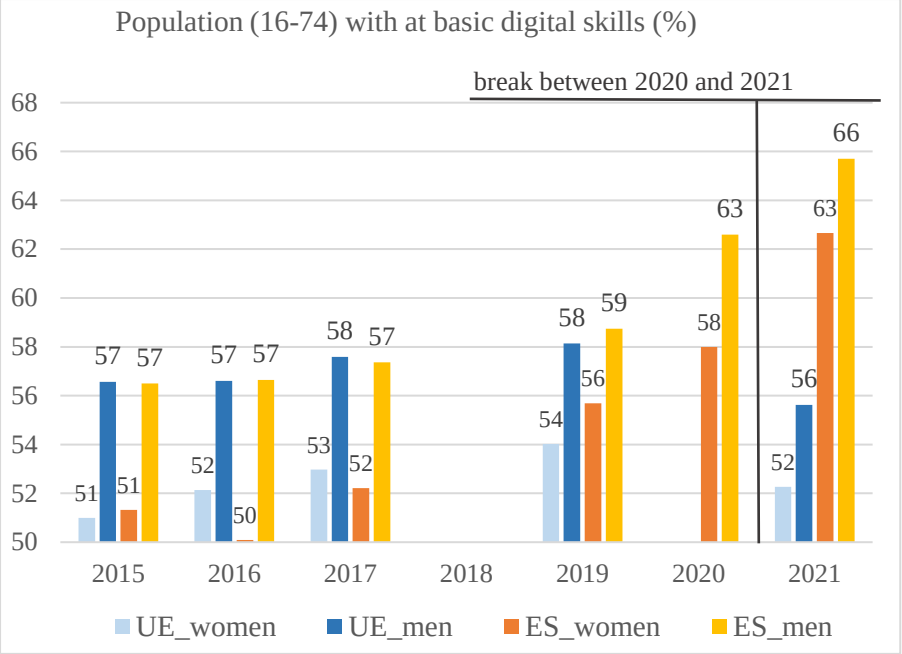


Figure 2. Percentage of individuals aged 16-74 with at least basic skills in the EU, and Spain, by sex (from 2015 to 2021)

2.3.3.2. ICT Specialists (and gender gap in ICT)

Target (UE)**: A digitally skilled population and highly skilled digital professionals, with the aim of achieving gender balance, where: (a) at least 80 % of those aged 16-74 have at least basic digital skills; **(b) at least 20 million ICT specialists are employed within the Union, while promoting the access of women to this field and increasing the number of ICT graduates.

***KPI definition** (referring to the part (b) of the target): number of individuals aged 15-74 who are employed as ICT specialists; and gender convergence, measured as the percentage of women and men among those individuals employed as ICT specialists. In accordance with the ISCO-08[1] code classification, ICT specialists are workers who have the ability to develop, operate and maintain ICT systems, and for whom ICT constitutes the main part of their job, including but not limited to ICT service managers, ICT professionals, ICT technicians, ICT installers and servicers.*

The gender gap in ICT employment is computed as share of female ICT specialists in total ICT employment. To be noted that the Decision does not establish a specific and quantitative target for gender convergence. Therefore, this part of the target is not treated as a separate KPI.

***Source**: Eurostat - Labour Force Survey.*
(https://ec.europa.eu/eurostat/databrowser/bookmark/98099845-5acb-4e55-babf-9eddeb55e7a8?lang=en)

***Available data points**: 2011- 2022.*

***Baseline value** (latest available historical data point):*

EU (2022) = 9.37 million / ES (2022) = 0.88 million

Share of female ICT specialists: EU (2022) = 18.9% / ES (2022) = 18%

Spanish Target: at least 1.75 million ICT specialists are employed in Spain, while promoting the access of women to this field and increasing the number of ICT graduates.

Spain currently employs 0.87 million ICT specialists as of 2022, constituting 4.3% of the total workforce. Spain's goal is to reach 1.75 million ICT specialists by 2030, which would represent 8.6% of the total employment at that time. The European target is set at 20 million ICT specialists, which, if achieved, would make up 9.8% of the total employment in the region.

To reach 1.75 million ICT specialists by 2030, Spain, in a first phase, plans to increase their number by 66 850 by 2025, while deploying the measures aimed at this objective. These measures are focused on training, so it would take at least four years to see the increase resulting from these measures. In addition, these years could see the integration of new ICT graduates into the labour market. In 2021 there was a significant increase in the percentage of ICT graduates (4.8% in 2021 compared to 4.0% in 2020), exceeding the EU average (4.2%). In a second phase, the impact of the measures implemented

[1] International Standard Classification of Occupations 2008

is expected to be higher, as they would have been deployed, and the annual increase would be 134,530 until the target is achieved.

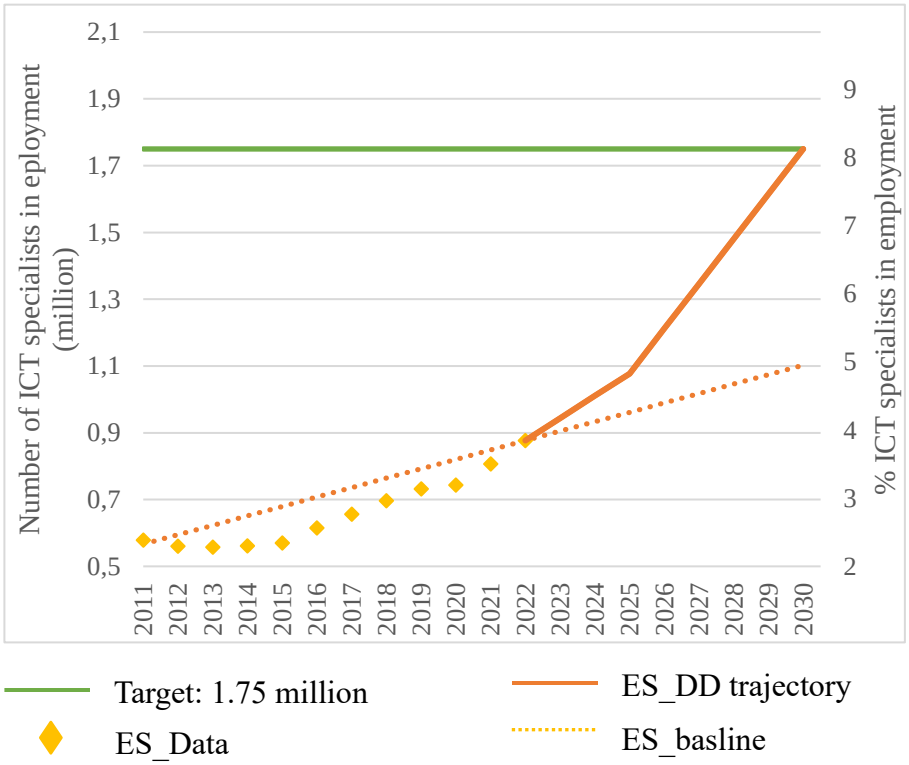


Figure 3. ICT specialists in Spain (ES). Historical data, Digital Decade (DD) trajectory and baseline trajectory towards 2030.

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
EU_Data	7.18	7.57	7.85	8.42	8.93	9.37								
EU_DD trajectory	Anual increase: 1.33 mill					9.37	10.70	12.03	13.36	14.70	16.01	17.34	18.67	20.00
EU_DD trajectory (%)	Anual increase: 0.7 p.p.					4.6	5.3	5.9	6.6	7.2	7.9	8.5	9.2	9.8
EU_baseline	7.70	8.03	8.37	8.70	9.04	9.37	9.70	10.04	10.37	10.71	11.04	11.37	11.71	12.04
ES_Data	0.66	0.70	0.73	0.74	0.81	0.88								
ES_DD trajectory	Annual increase (until 2025): 66,850/ Annual increase (2026-30): 134,530					0.88	0.94	1.0.1	1.08	1.21	1.35	1.48	1.62	1.75
ES_DD trajectory (%)	Annual increase (until 2025): 0.3 p.p./ Annual increase (2026-30): 0.7 p.p.					4.3	4.6	5.0	5.3	5.9	6.6	7.3	7.9	8.6
ES_baseline	0.74	0.76	0.79	0.82	0.85	0.88	0.91	0.93	0.96	0.99	1.02	1.05	1.07	1.10

Table 2. ICT specialists in the EU and Spain (ES). Historical data (million), Digital Decade (DD) trajectory and baseline trajectory towards 2030.

In 2022, the share of women employed in ICT in Spain was 18%, and Europe 18.9%. In the last year, Spain and Europe has decreased the share of women in the ICT market. To achieve convergence

between women and men in ICT specialists, Spain has implemented different measures to boost advanced digital skills among women (i.e. CODI Program; Generation D Change Agents, among others), support female entrepreneurs and attract female talent (i.e. ENISA Emprendedoras Digitales, among others).

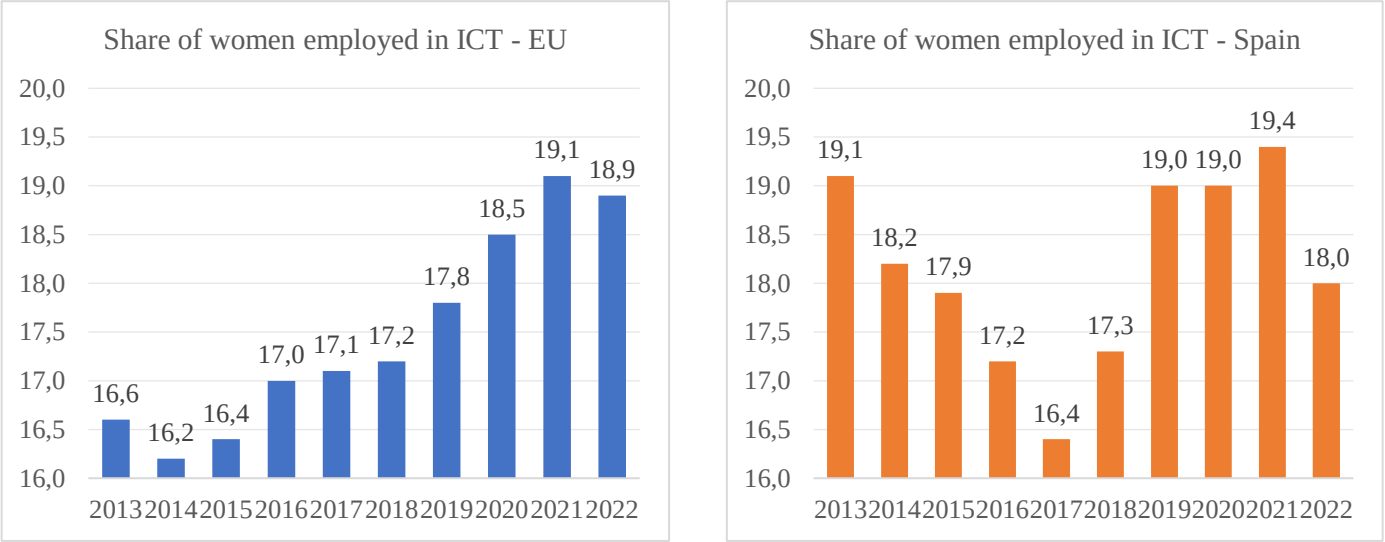


Figure 4. Share of women employed in ICT, EU and Spain.

2.3.3.3. Connectivity

***Target**: Secure, resilient, performant and sustainable digital infrastructures where all end users at a fixed location are covered by a gigabit network up to the network termination point, and all populated areas are covered by next-generation wireless high-speed networks with performance at least equivalent to that of 5G, in accordance with the principle of technology neutrality.*

Gigabit

***Target**: Secure, resilient, performant and sustainable digital infrastructures where all end users at a fixed location are covered by a gigabit network up to the network termination point, and all populated areas are covered by next-generation wireless high-speed networks with performance at least equivalent to that of 5G, in accordance with the principle of technology neutrality.*

***KPIs definition**: Gigabit connectivity, measured by the percentage of households covered by fixed Very High-Capacity Networks (VHCN). The technologies considered are those currently able to deliver gigabit connectivity, namely Fibre to the Premises (FTTP) and Cable DOCSIS (12) 3.1. The evolution of the FTTP coverage will also be monitored separately and taken into consideration when interpreting VHCN coverage data.*

***Source**: Broadband coverage in Europe studies for the European Commission by Omdia and Point Topic and DESI 2023 (https://digital-strategy.ec.europa.eu/en/library/broadband-coverage-europe-2021; https://digital-decade-desi.digital-strategy.ec.europa.eu/datasets/desi/charts)*

***Available time series**: 2013-2022*

***Baseline value** (latest available historical data point):*
EU (2022) = 73% / ES (2022) = 93.3%

Spanish Target: 100% gigabit coverage.

Spain is a frontrunner in Gigabit connectivity and will continue its deployment of VHCN networks through the programs UNICO Banda Ancha (€645M) with its calls for proposals in 2021, 2022 and 2023, with works to be completed by the end of 2023, 2024 and 2025, respectively. Other RRF-funded programs such as UNICO Banda Ancha Interconexión Terrena and UNICO Demanda CCAA Industria y Empresas will also contribute to achieving the objective. In addition, private operators continue to deploy and extend coverage in certain rural areas.

Our baseline trajectory shows that we will achieve the objective with the current actions and it is not necessary to design additional programs. In any case, specific actions can always be carried out to solve possible problems that may arise in the future.

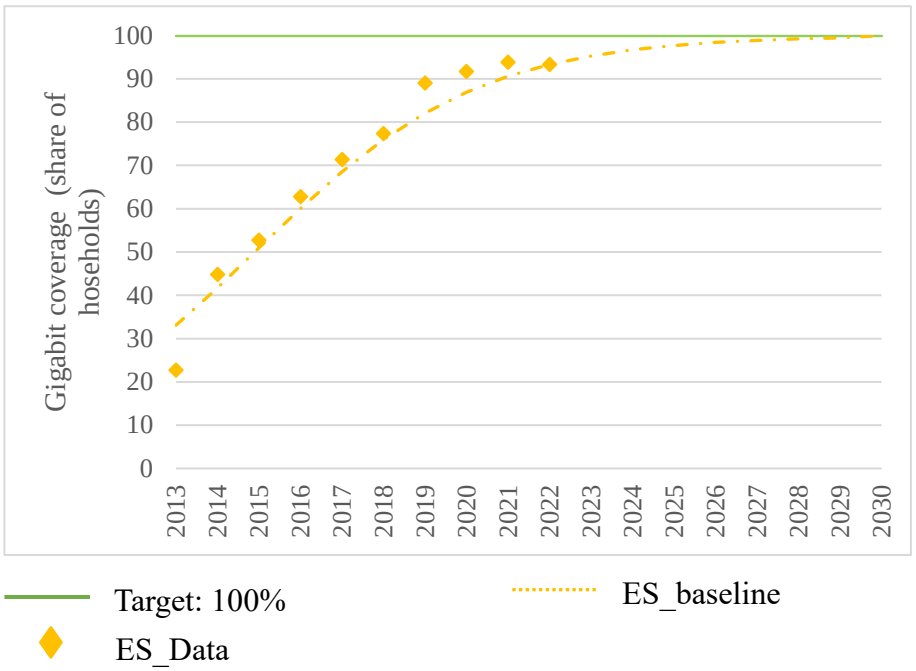


Figure 5. Gigabit coverage in Spain. Historical data, Digital Decade (DD) trajectory and baseline trajectory towards 2030

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
EU_Data	29.1	33.1	49.7	59.3	69.7	73.0								
EU_ trajectory							*82*	*89*	*93*	*96*	*98*	*99*	*99*	*100*
EU_baseline	49	54	59	64	69	73	*77*	*80*	*84*	*86*	*89*	*90*	*92*	*94*
ES_Data	71.4	77.4	89.0	91.7	93.8	93.3								
ES_baseline	69	76	82	87	91	93	*95*	*97*	*98*	*98*	*99*	*99*	*99*	*100*

Table 3. Gigabit coverage in Spain and the EU. Historical data (for both VHCN and FTTP), Digital Decade (DD) trajectory and baseline trajectory towards 2030

The FTTP coverage will follow a similar trend to the VHCN one. The reason behind this parallel behaviour is that most of the Spanish deployment of Gigabit connectivity has been done and will continue to be done through Fibre. Most of the non-fibre networks are in the process of migration to fibre in the following years.

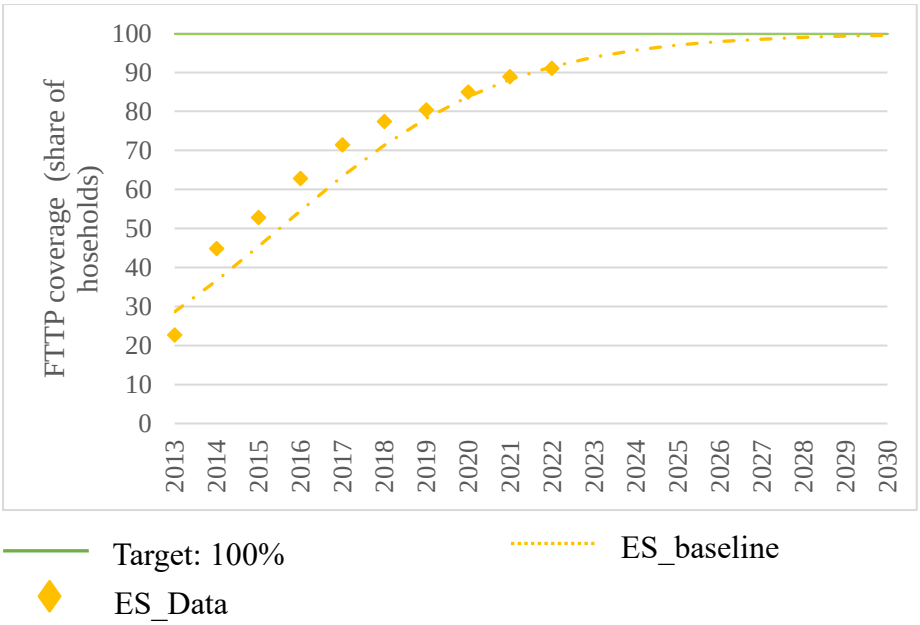


Figure 6. FTTP coverage in Spain, historical data and baseline trajectory towards 2030

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
EU_Data	29.2	33.3	37.8	43.0	49.1	56.0								
EU_DD trajectory						56	70	82	89	94	97	98	99	100
EU_baseline	31	36	40	46	51	56.0	61	66	70	75	78	82	85	87
ES_Data	71.4	77.4	80.4	84.9	88.9	91.0								
ES_baseline	63	71	78	84	88	*91*	*94*	*96*	*97*	*98*	*99*	*99*	*99*	*100*

Table 4. FTTP coverage in Spain and the EU. Historical data, Digital Decade (DD) trajectory and baseline trajectory towards 2030

5G coverage

***Target**: Secure, resilient, performant, and sustainable digital infrastructures, where: all end users at a fixed location are covered by a gigabit network up to the network termination point, and all populated areas are covered by next-generation wireless high-speed networks with performance at least equivalent to that of 5G, in accordance with the principle of technology neutrality.*

***KPIs definition**: 5G coverage, measured as the percentage of populated areas covered by at least one 5G network regardless of the spectrum band used.*

***Source** (for all these KPIs): Broadband coverage in Europe studies for the European Commission by Omdia and Point Topic and DESI 2023 (https://digital-strategy.ec.europa.eu/en/library/broadband-coverage-europe-2021; https://digital-decade-desi.digital-strategy.ec.europa.eu/datasets/desi/charts)*

***Available time series**: 2020-2022*
***Baseline value** (latest available historical data point):*

EU (2022, DESI 2023) = 81.2% / ES (2022, DESI 2023) = 82.3%

Spanish Target: 100% 5G coverage.

Spain has just launched the UNICO 5G Activas program which, with a budget of 546 million euros, will provide 5G Stand Alone coverage with a speed of 100 Mbps in those areas where there is no 4G coverage capable of offering 50 Mbps download speed. The program is complemented by another program: the UNICO 5G Backhaul FO program (€447M). The latter is aimed at providing fibre optic connection to those sites that do not have it and its work should be completed by December 2025.

The combination of these two programs is expected to allow Spain to achieve 5G coverage of 100% of the population well in advance of 2030. The baseline trajectory shows that we will achieve the objective with the current actions, and it is not necessary to design additional programs.

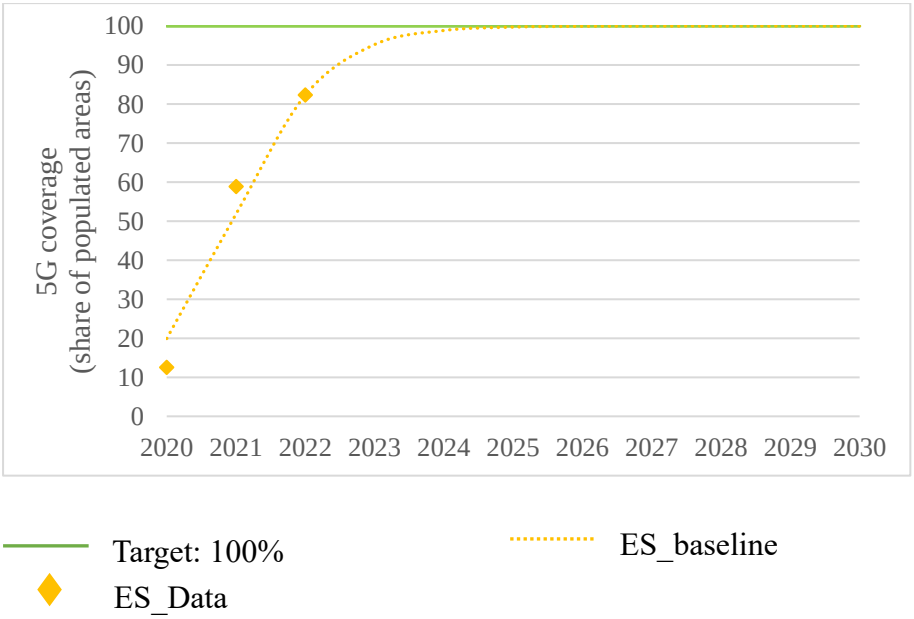


Figure 7. 5G rollout in Spain, historical data and baseline trajectory towards 2030

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
EU_Data	13.9	65.8	81.2								
EU_baseline	8.8	39.2	81.2	*96.7*	*99.5*	*99.9*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*
ES_Data	12.5	58.9	82.3								
ES_baseline	19.9	51.8	82.3	*95.3*	*98.9*	*99.7*	*99.9*	*100.0*	*100.0*	*100.0*	*100.0*

Table 5. 5G rollout in the EU and Spain, historical data and baseline trajectory towards 2030

Due to rounding reasons, 2027 seems to be the year where Spain achieves 100% coverage, but the "last mile" may require further work beyond 2027 (i.e., for <0.1% households). Also, as mentioned before, the indicator measurement may be adjusted, and the trajectory values would have to be adjusted too.

2.3.3.4. Semiconductors

***Target**: Secure, resilient, performant and sustainable digital infrastructures where the production, in accordance with Union law on environmental sustainability, of cutting-edge semiconductors in the Union is at least 20 % of world production in value.*

***KPI definition**: Semiconductors, measured as value generated, in terms of revenues, by semiconductor activities in the Union, in all stages of the value chain, with respect to the global market value. For the first year, reporting will be done on the basis of those activities in Europe.*

***Source**: Study in progress by IDC (International Data Corporation)*

No available data point.

***Baseline value** (latest available historical data point):*

EU = around 10% of the global market share in 2022 / ES= N/A

No EU or Spanish trajectory available yet as the study is still in progress. However, Spain has a bold commitment towards contributing to the EU's objectives. In particular, Spain will deploy its flagship semiconductor strategy "PERTE Chip", mobilizing €12.250M to develop the scientific, design and production capabilities of the microelectronics and semiconductor industry, and hence significantly contributing to EU-level target.

2.3.3.5. Edge-nodes

***Target**: Secure, resilient, performant and sustainable digital infrastructures where at least 10 000 climate-neutral highly secure edge nodes are deployed in the Union, distributed in a way that guarantees access to data services with low latency (i.e. a few milliseconds) wherever businesses are located.*

***KPI definition**: Edge nodes, measured as the number of compute nodes providing latencies below 20 milliseconds; such as an individual server or other set of connected computing resources, operated as part of an edge computing infrastructure, typically residing within an edge data centre operating at the infrastructure edge, and therefore physically closer to its intended users than a cloud node in a centralised data centre.*

***Source**: Edge Observatory*

No available data point.

***Baseline value** (latest available historical data point):*
EU (2022) = N/A / ES (2022) = N/A

At the time of adoption of this National Roadmap, the Edge Observatory has yet to produce its first edge deployment data collection exercise. As a result, the trajectory for Spain is not yet available. Additionally, Spain considers that this measure will be led mainly by private initiative, which will be complemented by the results of the IPCEI-CIS and, in the future, by specific actions in rural areas to resolve possible market failures.

2.3.3.6. Quantum computing

***Target:** Secure, resilient, performant and sustainable digital infrastructures where the Union has, by 2025, its first computer with quantum acceleration, paving the way for the Union to be at the cutting edge of quantum capabilities by 2030.*

***KPI definition:** Quantum computing, measured as the number of operational quantum computers or quantum simulators, including accelerators of High Performance Computing supercomputers, deployed and accessible to the user communities.*

***Source:** Quantum Flagship study*
No available data point.

***Baseline value** (latest available historical data point):*
EU (2022) = 0 / ES (2022) = 0

As the Commission points out for quantum computing, it is not possible to establish a baseline trajectory.

To contribute to the achievement of the European target, the country launched the Quantum Spain program (January 2022), which promotes and strengthens the national Quantum Computing

ecosystem, with the aim of creating the first quantum computing environment in southern Europe. This measure is expected to run until December 2025.

2.3.3.7. Take up of digital technologies.

***Target**: The digital transformation of businesses, where at least 75 % of Union enterprises having taken up one or more of the following, in line with their business operations: (i) cloud computing services; (ii) big data; (iii) artificial intelligence.*

Reforms and investments under component 13 "Support to SMEs" in Spain's RRP not only impact the specific target of SMEs' basic digital intensity but also the targets related to advanced digital technologies such as cloud computing, big data, or AI. In this context, Spain has launched: the Digital Kit initiative (the first call was in March 2022) and the Agents of Change programme (whose bases were published in December 2022).
Furthermore, Spain launched other measures focused on AI (i.e. Integration of AI into value chains programme), data-sharing ecosystem (i.e. Gaia-X Hub) and cloud (i.e. UNICO I+D Cloud programme).

Cloud:

***Target**: The digital transformation of businesses where at least 75 % of Union enterprises having taken up one or more of the following, in line with their business operations: (i) cloud computing services; (ii) big data; (iii) artificial intelligence.*

***KPIs definition**:*
(i). Cloud computing, measured as the percentage of enterprises using at least one of the following cloud computing services: finance or accounting software applications, enterprise resource planning (ERP) software applications, customer relationship management (CRM) software applications, security software applications, hosting the enterprise's database(s), and computing platform providing a hosted environment for application development, testing or deployment ([2]).

***Source**: Eurostat - European Union survey on ICT usage and e-commerce in enterprises.*
***Available time series**: Cloud: 2014, 2016, 2018, 2020 (https://ec.europa.eu/eurostat/databrowser/bookmark/684b608b-74c2-4947-921f-e6d0553a5944?lang=en) and 2021 (break-in-series in 2021) (https://ec.europa.eu/eurostat/databrowser/bookmark/d1b4d6b3-a675-48ba-b080-e566d7aa6118?lang=en)*

***Baseline value** (latest available historical data point):*
EU (2021) = 34% / ES (2021) = 27%
***Spanish Target: at least 75 % of Spanish companies use cloud computing**.*

2 As defined in Commission Implementing Regulation (EU) 2022/1344 of 1 August 2022 laying down the technical specifications of data requirements for the topic 'ICT usage and e-commerce' for the reference year 2023, and subsequent implementing regulations pursuant to Regulation (EU) 2019/2152 of the European Parliament and of the Council (Text with EEA relevance), in particular Article 7(1) and Article 17(6) thereof.

In 2021, 27% of Spanish companies used cloud computing, and the value by 2030 in the "business as usual" scenario would be 47.2%. This value is below of the Spanish target by 2030, at least 75% of Spanish companies use cloud computing.

Spain expects increasing the percentage of enterprises which use cloud computing with the same trend to the "baseline" until 2025. Between 2025 and 2026, the growth would be slightly higher than the baseline, while the Digital Kit programme is being completed. From 2027 onwards, the most relevant impact of the measures is expected to be observed, when the measures aimed at the integration of technological advances and the digital transformation of their businesses will become evident.

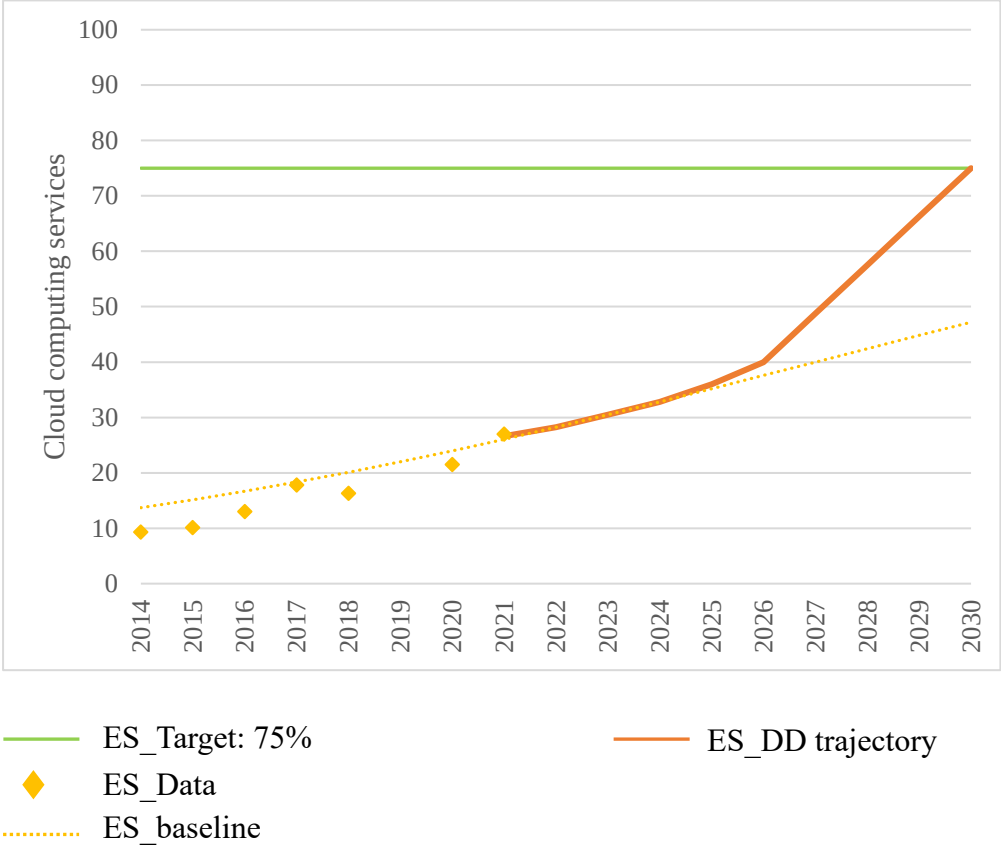


Figure 8. Share of enterprises using Cloud services in Spain. Historical data, Digital Decade (DD) trajectory and baseline trajectory towards 2030 (3)

3 Eurostat's indicator "Enterprises purchasing at least one of the following CC services: hosting of the enterprise's database, accounting software applications, customer relationship management software, computing power" (code E_CC_GE_ME) is used for the period 2014-2020. A break in series occurred in 2021 when the indicator "Enterprises buying sophisticated or intermediate CC Services" is used. This indicator includes different CC services: Accounting software (CC_PFACC); ERP Software (CC_PERP); CRM Software (CC_PCRM); Security Software (CC_PSEC); Database hosting (CC_PDB) and Hosting environment for application development (CC_PDEV).

	2017	2018	2019	2020	2021 *	2022	2023	2024	2025	2026	2027	2028	2029	2030
EU_Data	-	16.1	-	25.6	34.0									
EU_DD trajectory					34.0	40.6	47.3	53.5	59.0	63.8	67.7	70.8	73.2	75.0
EU_baseline	19.3	22.6	26.1	30.0	34.0	38.2	42.4	46.5	50.5	54.3	57.9	61.1	63.9	66.5
ES_Data	17.8	16.3	-	21.5	27.0									
ES_DD trajectory					27.0	28.2	30.5	32.8	36.0	40.0	48.8	57.5	66.3	75.0
ES_baseline	18.3	20.1	22.0	24.0	27.0	28.2	30.5	32.8	35.2	37.6	40.0	42.4	44.8	47.2

Note*: Break in series in 2021.

Table 6. Share of enterprises using Cloud services in the EU and Spain. Historical data, Digital Decade (DD) trajectory and baseline trajectory towards 2030

Big Data:

***Target**: The digital transformation of businesses, where at least 75 % of Union enterprises having taken up one or more of the following, in line with their business operations: (i) cloud computing services; (ii) big data; (iii) artificial intelligence (AI).*

***KPIs definition**:*

(ii) Big data, measured as the percentage of enterprises analysing big data from any data source (internal or external). As of the 2024 report, big data will be measured by the percentage of enterprises performing data analytics (internally or externally).

***Source**: Eurostat - European Union survey on ICT usage and e-commerce in enterprises.*
***Available time series**: Big data: 2016, 2018 (https://ec.europa.eu/eurostat/databrowser/view/ISOC_EB_BD__custom_4983532/bookmark/table?lang=en&bookmarkId=0268e676-ae3f-4e40-9c04-a8956648180f) 2020 (https://ec.europa.eu/eurostat/databrowser/view/ISOC_EB_BD__custom_4983532/default/table?lang=en).*

***Baseline value** (latest available historical data point):*
EU (2020) = 14% / ES (2020) = 9%

Spanish Target: at least 75 % of Spanish companies use big data.

In 2020, the percentage of companies using big data was 9%. In 2030, 18.2% of Spanish companies would use big data in the "business as usual" scenario. The Digital Kit is expected to intensify the increases that are not yet reflected in the indicators.

To achieve that at least 75% of Spanish companies use big data by 2030, the trend would know the highest increase between 2025 and 2026, when the Digital Kit program will be finalized, and enterprises will integrate this technology. Afterward, the growth would be slower.

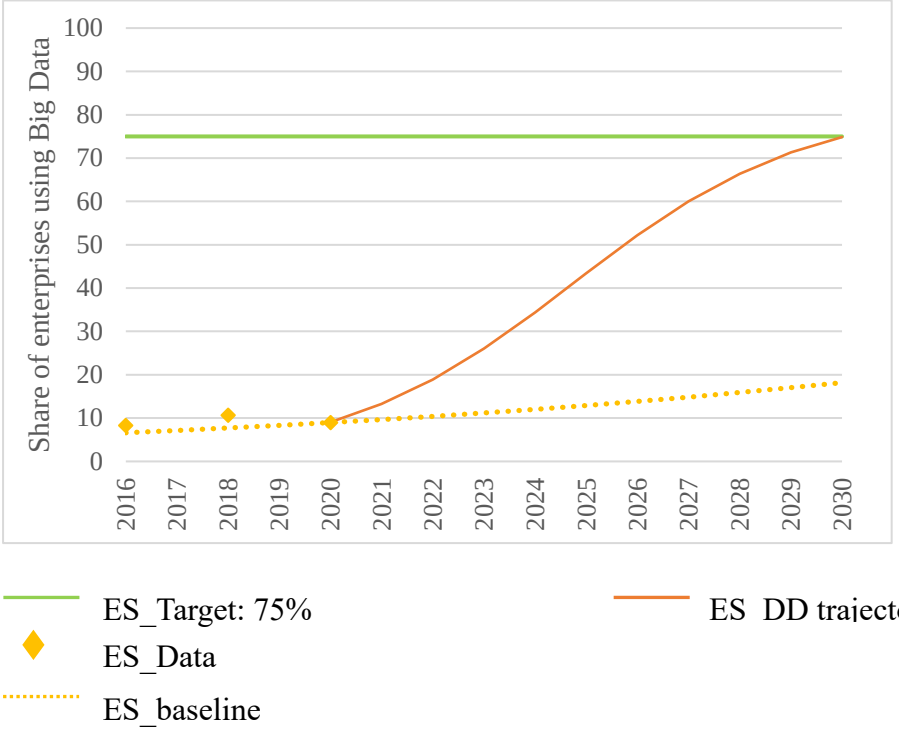


Figure 9. Share of enterprises using Big Data in Spain. Historical data, Digital Decade (DD) trajectory and baseline trajectory towards 2030

	2017	2018	2019	2020 *	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
EU_Data	-	12.3	-	14.2										
EU_DD trajectory				14.2	19.6	26.6	34.6	43.0	51.3	58.6	64.6	69.2	72.6	75.0
EU_baseline	10.2	11.3	12.6	14.0	15.5	17.1	18.8	20.7	22.6	24.7	26.9	29.1	31.5	33.9
ES_Data	-	10.7	-	9.0										
ES_DD trajectory				9.0	13.2	18.9	26.0	34.4	43.4	52.2	60.0	66.4	71.3	75.0
ES_baseline	7.1	7.7	8.3	9.0	9.7	10.4	11.2	12.0	12.9	13.9	14.9	15.9	17.0	18.2

Note*: Break in series in 2020.

Table 7. Share of enterprises using Big Data in Spain and the EU. Historical data, Digital Decade (DD) trajectory and baseline trajectory towards 2030.

Artificial Intelligence:

***Target**: The digital transformation of businesses where at least 75% of Union enterprises having taken up one or more of the following, in line with their business operations: (i) cloud computing services; (ii) big data; (iii) artificial intelligence (AI).*

***KPIs definition**:*

(iii). Artificial intelligence, measured as the percentage of enterprises using at least one artificial intelligence technology ([4]).

***Source**: Eurostat - European Union survey on ICT usage and e-commerce in enterprises.*
***Available time series**: AI: 2021*
(https://ec.europa.eu/eurostat/databrowser/view/ISOC_EB_AI/default/table?lang=en&category=isoc.isoc_e.isoc_eb).

***Baseline value** (latest available historical data point):*
EU (2021) = 8% / ES (2021) 8%.

***Spanish Target: at least 75 % of Spanish companies use artificial intelligence (AI)**.*

There is no time series data available for AI adoption, so it is not possible to build a data-driven Digital Decade trajectory. Without interventions, the value in 2030 is expected to be 18.9%.

In 2021, the Spain and EU average data of AI adoption are similar, 7.7% and 7.9%. According to the trajectory of the Spanish digital decade, between 2021 and 2024 the trend would be similar to the baseline. During this time, the measures Integration of AI in the value chain and R&D Missions in Artificial Intelligence would be deployed. In 2025, the increase will accelerate, accompanying the end of the AI Network of Excellence measure. In 2027, largest increase will be seen, and after that, the growth would slow down.

4 Same as note (11).

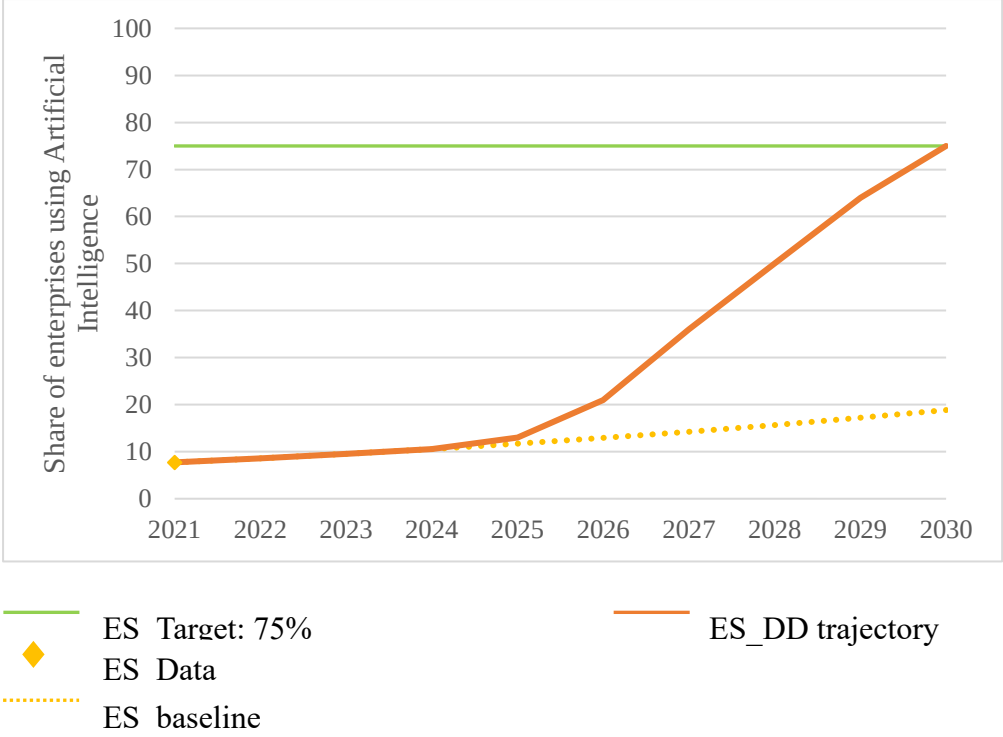


Figure 10. Share of enterprises using AI in Spain. Historical data, Digital Decade (DD) trajectory and baseline trajectory towards 2030.

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
EU_Data	7.9									
EU_DD trajectory	7.9	12.9	19.9	29.0	39.7	50.3	59.6	66.8	71.8	75.0
EU_baseline	8.0	8.9	10.0	11.1	12.3	13.7	15.2	16.8	18.5	20.3
ES_Data	7.7									
ES_DD trajectory	7.7	8.6	9.5	10.6	13.0	21.0	36.0	50.0	64.0	75.0
ES_baseline	7.7	8.6	9.5	10.6	11.7	12.9	14.2	15.7	17.2	18.9

Table 8. Share of enterprises using AI in the EU and Spain. Historical data, Digital Decade (DD) trajectory and baseline trajectory towards 2030

2.3.3.8. Basis level of digital intensity

***Target**: The digital transformation of businesses where more than 90% of the Union SMEs reaching at least a basic level of digital intensity ([5]).*

***KPIs definition**: SMEs with at least a basic level of digital intensity, measured as the percentage of SMEs using at least 4 of 12 selected digital technologies.*

***Source**: Eurostat - European Union survey on ICT usage and e-commerce in enterprises (code: ISOC_E_DII 20) (https://ec.europa.eu/eurostat/databrowser/bookmark/0c1f4b1e-3a19-4232-a1f4-7de6b576d9b8?lang=en).*
***Available time series**: 2015-2022 (break in series every year).*

***Baseline value** (latest available historical data point):*
EU= 69% / ES= 68%

Spanish Target: more than 90% of the Spanish SMEs reaching at least a basic level of digital intensity.

The methodology of this indicator has been modified several times. For this reason, it isn't possible to define baseline. The change in the composition of the indicator had prompted the Commission to work on establishing a consistent definition every two years starting from 2021. As a result, the 2021 figures will be comparable with those of 2023, 2025, 2027, and 2029, while the 2022 figures will be comparable with those of 2024, 2026, 2028, and 2030. For this reason, two digital decade trajectories will be defined (for even and odd years).

The trajectories of the digital decade in any of its forms will grow slightly until 2025. The latest data in this index doesn't capture the impact of the Digital Kit Spain. The first call of this Programme was in the first quarter of 2022, when the data were being collected. Similarly, Spain also launched in 2022 the Agents of Change programs to support SMEs in hiring digital transformation experts (with the bases published in December 2022). These programs will end between 2024 and 2025 and should boost the percentage of SMEs with at least a basic level of digital intensity.

5 As defined in the Commission Implementing Regulation (EU) 2021/1190 of 15 July 2021 laying down the technical specifications of data requirements for the topic 'ICT usage and e-commerce' for the reference year 2022, and subsequent implementing regulations pursuant to Regulation (EU) 2019/2152 of the European Parliament and of the Council (Text with EEA relevance), in particular Article 7(1) and Article 17(6) thereof.

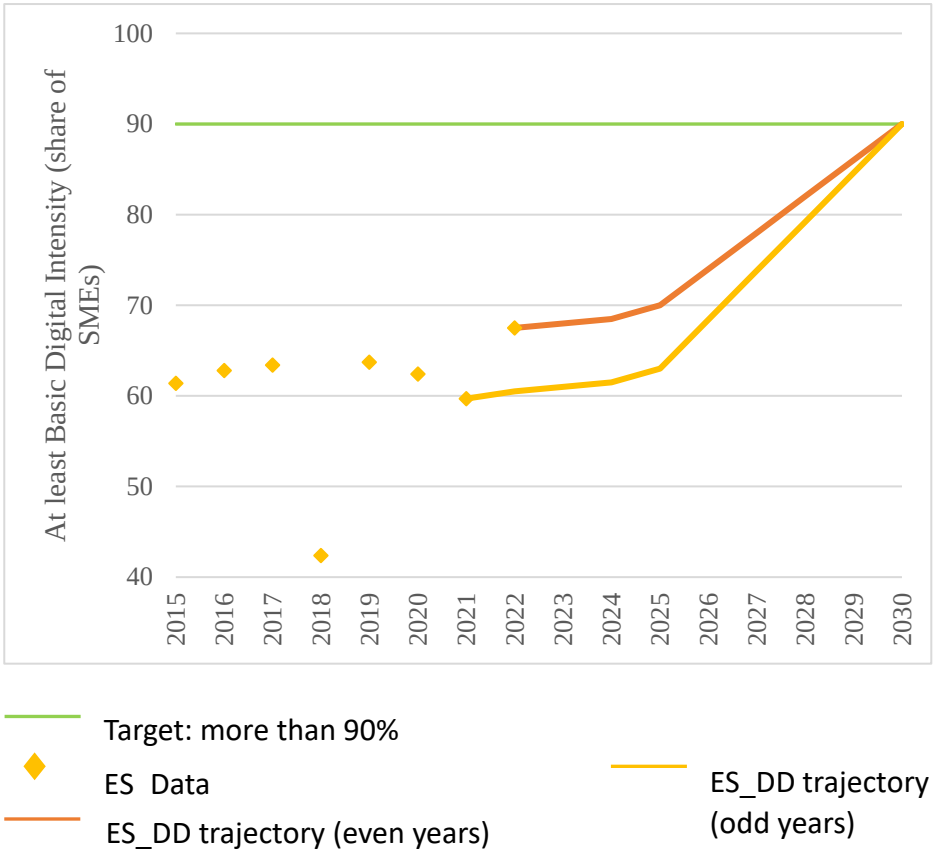


Figura 11. Digital Intensity Index. Historical data and the Digital Decade (DD) trajectory towards 2030

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
EU_Data	56.6	52.2	59.8	60.2	54.9	69.1								
EU_DD trajectory	Anual increase: 2.6 p.p.					69.1	71.6	74.3	76.9	79.5	82.1	84.7	87.4	90
ES_Data	63.4	42.4	63.7	62.4	59.7	67.5								
ES_DD trajectory (even years)						67.5	68.0	68.5	70.0	74.0	78.0	82.0	86.0	90
ES_DD trajectory (odd years)					59.7	-	61.0	61.5	63.0	68.4	73.8	79.2	84.6	90

Table 9. Digital Intensity Index in the EU and Spain. Historical data and the Digital Decade (DD) trajectory towards 2030

2.3.3.9. Innovative businesses/scale-ups (Unicorns)

Target: *The digital transformation of businesses where the Union facilitating the growth of its innovative scale-ups and improving their access to finance, leading to at least doubling the number of unicorns.*

KPIs definition: *Unicorns are measured as the sum of unicorns' unicorns referred to in Article 2, point (11)(a), of Decision (EU) 2022/2481 and those referred to in Article 2, point (11)(b), of that Decision.*

Source: *Dealroom platform. DESI. (https://digital-strategy.ec.europa.eu/en/policies/desi-integration-technology-enterprises)*

Available time series: *UE: 2008-2022/ 2021- 2022*

Baseline value *(latest available historical data point):*
EU= 249 ([6]) / ES = 14

Spanish Target: 24 unicorns, double by April 2022.

According to Dealroom's April 2023 report, the number of unicorns was 14. If the baseline is the number at the beginning of 2022 (the baseline when the target was set), the number by 2030 should be 24, double by that date (12 in April 2022). The trend shows Spain reaching the target by 2025.

To foster the increase in the number of emerging companies and unicorns, Spain launched several measures notably the Start-up Law, and other specific programmes and investments, such as the Next-Tech fund, to address this target.

6 The Dealroom platform updates regularly the number of unicorns. The EU value of 249 in 2022 was downloaded from the platform on 09/01/2023. The United Kingdom is always excluded from the counting.

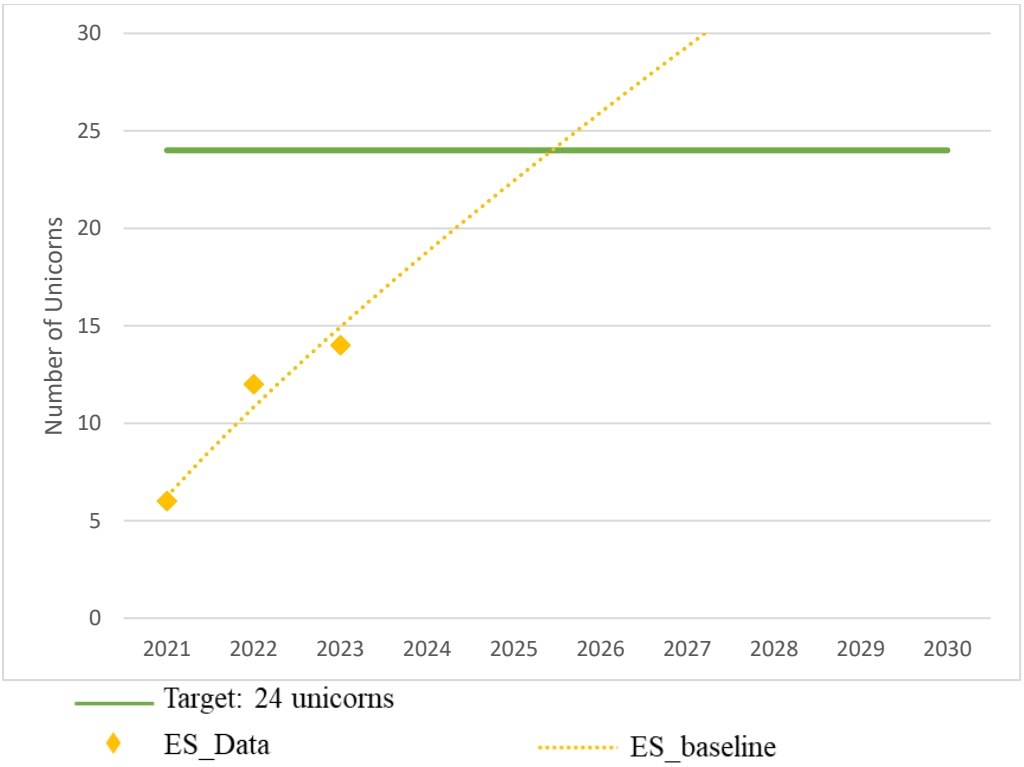


Figure 12. Number of Unicorns in Spain. Historical data and baseline trajectory

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
EU_Data	203	249								
EU_DD trajectory		249	367	498	676	917	1,243	1,687	2,288	3,104
ES_Data	6	12	14							
ES_DD trajectory			14	16	24					

Table 10. Number of Unicorns in Spain and the EU.

2.3.3.10. Digitalisation of public services

***Target**: The digitalisation of public services, where there is 100 % online accessible provision of key public services and, where relevant, it is possible for citizens and businesses in the Union to interact online with public administrations.*

Among the structural reforms included in the Spanish digitalisation process, the modernization and digitalisation of the Administration is one of them. Some measures are focused on providing public services to citizens, while others are applicable to both citizens and businesses.

Digital public services for citizens

***Target**: The digitalisation of public services, where there is 100 % online accessible provision of key public services and, where relevant, it is possible for citizens and businesses in the Union to interact online with public administrations.*

***KPIs definition**:*
Citizens: Online provision of key public services for citizens, measured as the share of administrative steps that can be done fully online for major life events. The following life events are considered: moving; transport; starting a small claims procedure; family; career; studying; and health.

***Source**: e-Government benchmark*
***Available time series**: 2013-2022 (break in series as of 2020)*

***Baseline value** (latest available historical data point):*
EU (2022) = 77 / ES (2022) = 86

Spanish Target: where there is 100 % online accessible provision of key public services and, where relevant, it is possible for citizens in Spain to interact online with public administrations.

In 2022, the Spanish score for digital public services for citizens was higher than the European value, sustaining the trend of previous years with respect to the European average. However, the Spanish value is 13.8 points below the target, so efforts are directed towards further improving public services.

The latest update of the data shows a decrease compared to the previous year, due to methodological changes. For this reason, the defined increase is more discrete than a theoretical trajectory with an S-shaped curve. Thus, in 2023 the increase will be moderate, between 2024 and 2025 there will be a small acceleration, and in 2026 the increase will be even higher. The My Citizen Folder measure will simplify the relationship between the administration and citizens, its implementation was developed at the end of 2022 and the App was launched on December 15, 2022. The different measures aimed to improve the services to the citizens will be deployed until 2025, thus the most relevant impact will be produced later.

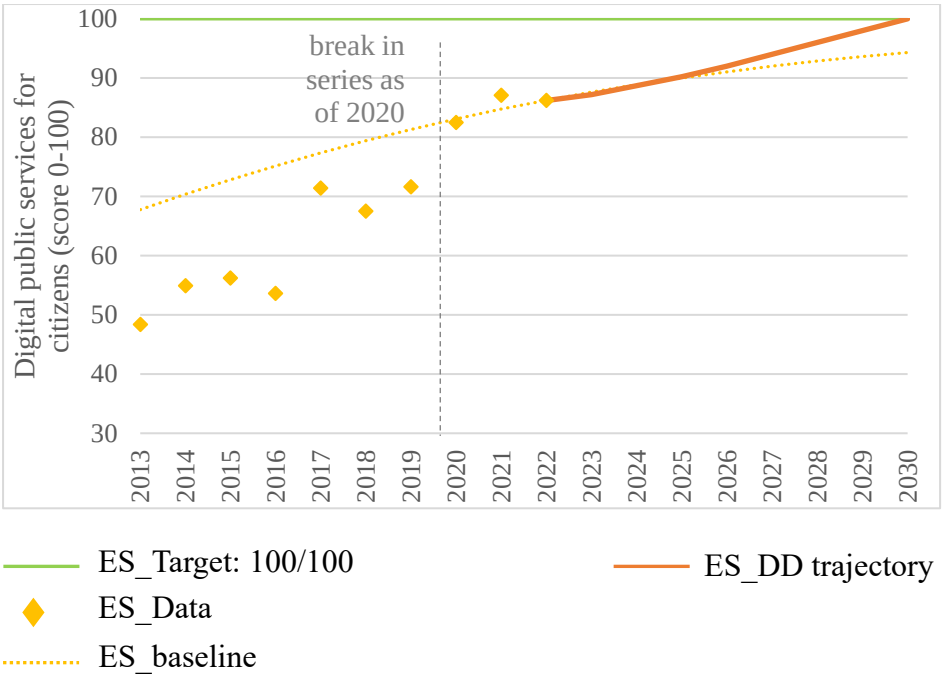


Figure 13. Score of digital public services for citizens in Spain.

	2017	2018	2019	2020 *	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
EU_Data	74.3	75.7	78.6	74.6	74.6	77.0								
EU_DD trajectory						77.0	87.3	93.4	96.7	98.4	99.3	99.7	99.9	100
EU_baseline	56.3	60.9	65.4	69.5	73.4	77.0	80.2	83.1	85.6	87.8	89.7	91.3	92.7	93.9
ES_Data	71.4	67.5	71.6	82.5	87.1	86.2								
ES_DD trajectory	77.4	79.4	81.3	83.1	84.7	86.2	87.6	88.9	90.0	91.1	92.0	92.8	93.6	94.3
ES_baseline						86.2	87.2	88.7	90.2	92.0	94.0	96.0	98.0	100

Note*: break in series.

Table 11. Score of digital public services for citizens in Spain and the EU.

Digital public services for businesses

***Target**: The digitalisation of public services where 100 % online accessible provision of key public services and, where relevant, the possibility for citizens and businesses in the Union to interact online with public administrations.*

***KPIs definition**:*

Businesses: Online provision of key public services for businesses, measured as the share of administrative steps needed to start a business and conduct regular business operations, which can be done fully online.

***Source**: e-Government benchmark*
***Available time series**: 2013-2022 (break in series as of 2020)*

***Baseline value** (latest available historical data point):*
EU (2022) = 84 / ES (2022) = 91

Spanish Target: where there is 100 % online accessible provision of key public services and, where relevant, it is possible for businesses in Spain to interact online with public administrations.

Spain's score for digital public services for businesses is higher than that of citizens, similar to the European average. Moreover, the score to Spain is above the European average.

Spain's good position on this KPI, together with the government's efforts, provides reason to expect that the achievement of the 2030 target. However, in 2022 there was a decrease in the data, due to methodological reasons in data collection. Therefore, in 2023, Spain expects to recover a value similar to that of 2021. From the following year onwards, the upward trend is expected to stabilize.

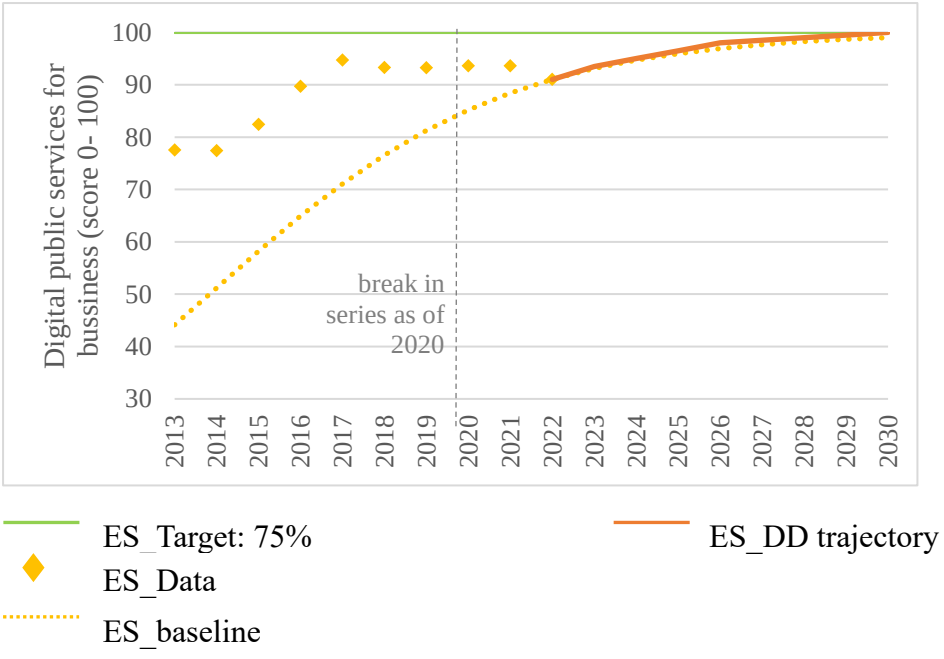


Figure 14. Score of digital public services for business in Spain.

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
EU_Data	83.1	84.6	87.7	84.4	81.7	83.7								
EU_DD trajectory						83.7	90.9	95.1	97.5	98.7	99.4	99.7	99.9	100
EU_baseline	63.2	68.1	72.7	76.8	80.5	83.7	86.5	88.8	90.8	92.5	93.9	95.0	96.0	96.8
ES_Data	94.7	93.2	93.2	93.6	93.6	91.0								
ES_DD trajectory						91.0	93.5	95.0	96.5	98.0	98.5	99.0	99.5	100
ES_baseline	71.1	76.5	81.2	85.2	88.4	91.0	93.1	94.7	96.0	96.9	97.7	98.2	98.7	99.0

Table 12. Score of digital public services for business in Spain and the EU.

2.3.3.11. Electronic health record

***Target**: The digitalisation of public services where 100 % of Union citizens have access to their electronic health records.*

***KPI definition**: Access to e-health records, measured as: (i) the nationwide availability of online access services for citizens to their electronic health records data (via a patient portal, or a patient mobile app) with additional measures in place that enable certain categories of people (e.g. guardians for children, people with disabilities, elderly) to also access their data, and (ii) the percentage of individuals that have the ability to obtain or make use of their own minimum set of health-related data currently stored in public and private electronic health-record (EHR) systems.*

***Source**: Empirica GmbH and PredictBy*
No available time series

***Baseline value** (latest available historical data point):*
EU (2023) = 72 (0-100 score) / ES (2023) = 83 (0-100 score)

Spanish Target: The digitalisation of public services where 100 % of Spanish citizens have access to their electronic health records.

In 2023, the Spanish scored 83 on a scale 0-100, higher than European average value. For this reason, Spain could assume linear function form and follow a straight line to reach the 2030 target, i.e. 100 % of Spanish citizens having access to their electronic health records. To achieve this target, it is necessary to increase the Spanish value by 2.4 p.p. per year.

To improve eHealth services for citizens, Spain has defined the component 18 in Spain's RRP "Modernisation of the National Health System". In this regard, Spain is developing a health data lake to collect health data from different information systems, process and analyse them in order to improve, among other aspects, diagnosis and treatment, health risk prediction, pattern identification and citizens' access to their health records.

Also, Spain participates in the European initiative to ensure continuity of care for citizens, access to safe and quality healthcare within the EU, and the promotion of a European system of interoperability of electronic prescriptions, called My Health@EU. eHealth services will be added to the Spanish

citizen's portal (Carpeta Ciudadana) and will allow access to national systems for the exchange of medical records.

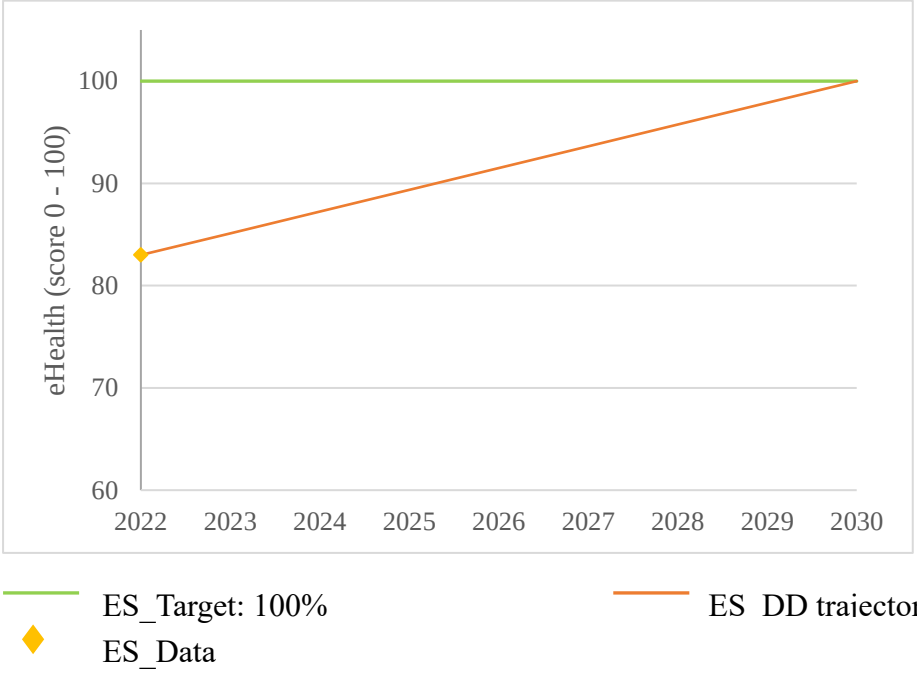


Figure 15. eHealth composite indicator in Spain. Historical data and DD trajectory

		2022	2023	2024	2025	2026	2027	2028	2029	2030
EU_Data		72								
EU_ DD trajectory	Anual increase: 3.5 p.p.		75.5	79.0	82.5	86.0	89.5	93.0	96.5	100
ES_Data		83								
ES_ DD trajectory	Anual increase: 2.1 p.p.		85.1	87.3	89.4	91.5	93.6	95.8	97.9	100

Table 13. eHealth composite indicator in Spain and the EU. Historical data and DD trajectory

2.3.3.12. Electronic identification (eID)

***Target**: The digitalisation of public services, where 100 % of Union citizens have access to secure electronic identification (eID) means that are recognised throughout the Union, enabling them to have full control over identity transactions and shared personal data.*

***KPI definition:** Access to eID is measured by two KPIs: (1) the number of Member States that have notified at least one national eID scheme in accordance with Regulation (EU) No 910/2014; and (2) as the number of Member States that have provided access to secure privacy-enhancing eID via the European Digital Identity Wallet in accordance with the Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EU) No 910/2014 as regards establishing a framework for a European Digital Identity[7])*

***Source**: The European Digital Identity Framework*
No available data point.

Spanish Target: The digitalisation of public services, where 100 % of Spanish citizens have access to secure electronic identification (eID) means that are recognised throughout the Union, enabling them to have full control over identity transactions and shared personal data.

According to the access to secure electronic identification, The Spain's ID card (DNIe) has been notified at the level of assurance "high" under the Documento Nacional de Identidad electrónico (DNIe) scheme. Also, is expected to boost the achievement of this target the measures' New digital identity model.

In addition, Spain is participating in three large-scale pilot projects financed under the Digital Europe Program. Spain is coordinating one of them, which particularly focus on educational and professional qualifications and Social Security documents.

[7] COM/2021/281 final.