

**Digital Decade
Country Report 2024:**

Portugal

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Executive summary

Portugal has untapped potential to contribute to the European Union's (EU) Digital Decade objectives and targets, in view of a successful digitalisation that fosters competitiveness, resilience, sovereignty, European values and climate action.

In 2023, Portugal made notable progress in e-health and in rolling out 5G networks, including in the 3.4–3.8 GHz band. However, **important challenges persist** in improving basic and advanced skills across the population.

Digitalisation is a priority of the Portuguese authorities with the emphasis on reliable online public services, development of digital skills and unleashing the digital potential of enterprises. Portugal is seizing the opportunity to use EU funds to transform its economy and society and is devising its strategies on new technologies such as cybersecurity, AI, and advanced computing. Its work in this respect is facilitated by excellent digital infrastructure. However, despite the efforts, some metrics related to the general population and enterprises suggest the need for more intensive action.

According to the Special Eurobarometer 'Digital Decade 2024'¹, 74% of Portugal's population consider that the digitalisation of daily public and private services is making their lives easier (just above the EU average of 73%).

Portugal is a member of the already established Local Digital Twins towards CitiVERSE European Digital Infrastructure Consortium (LDT CitiVERSE EDIC) and of the EUROPEUM-EDIC. Portugal, together with other Member States is participating in the works for the possible future EDICs: Cybersecurity Skills Academy EDIC, the EUCAIM EDIC and the Genome EDIC².

The Portuguese Recovery and Resilience plan dedicates EUR 4.5 billion (21% of the total allocation)³ to the digital transformation, with priorities given to digital qualification and skills and the digital transformation of businesses. Under Cohesion Policy, an additional EUR 2.4 billion (11% of the country's total Cohesion Policy funding) is allocated to the country's digital transformation⁴.

¹ Special Eurobarometer 551 on 'the Digital Decade' 2024: <https://digital-strategy.ec.europa.eu/en/news-redirect/833351>.

² Information last updated on 31 May 2024.

³ The share of financial allocations that contribute to digital objectives has been calculated using Annex VII to the Recovery and Resilience Facility Regulation.

⁴ This amount includes all investment specifically aimed at or substantially contributing to digital transformation in the 2021–2027 Cohesion Policy programming period. The source funds are the European Regional Development Fund, the Cohesion Fund, the European Social Fund Plus, and the Just Transition Fund.

Digital Decade KPI ⁽¹⁾	Portugal			EU		Digital Decade target by 2030	
	DESI 2023	DESI 2024	Annual progress	DESI 2024 (year 2023)	Annual progress	PT	EU
Fixed Very High-Capacity Network (VHCN)	93.0%	94.2%	1.2%	78.8%	7.4%	x	100%
Fibre to the Premises (FTTP) coverage	90.8%	92.3%	1.7%	64.0%	13.5%	x	-
Overall 5G coverage	70.1%	98.1%	40.0%	89.3%	9.8%	x	100%
Semiconductors		NA					
Edge Nodes		19		1 186		x	10 000
SMEs with at least a basic level of digital intensity	48.6%	53.6%	5.0%	57.7%	2.6%	90%	90%
Cloud	28.1%	32.3%	7.2%	38.9%	7.0%	x	75%
Artificial Intelligence	7.2%	7.9%	4.7%	8.0%	2.6%	x	75%
Data analytics	NA	38.6%	NA	33.2%	NA	x	75%
AI or Cloud or Data analytics	NA	54.4%	NA	54.6%	NA	75%	75%
Unicorns		1		263		2	500
At least basic digital skills	55.3%	56.0%	0.6%	55.6%	1.5%	80%	80%
ICT specialists	4.3%	4.5%	4.7%	4.8%	4.3%	7%	~10%
e ID scheme notification		Yes					
Digital public services for citizens	77.8	81.5	4.8%	79.4	3.1%	x	100
Digital public services for businesses	81.9	81.9	0.0%	85.4	2.0%	x	100
Access to e-Health records	62.7	86.0	37.2%	79.1	10.6%	x	100

⁽¹⁾ See the methodological note for the description of the indicators and other descriptive metrics

⁽²⁾ Last measure used is for 2021

National digital decade strategic roadmap

With respect to **Portugal's** contribution to the Digital Decade reflected in its roadmap, it is demonstrating **some ambition** however, based on this document, intends to allocate **limited effort** to achieve the Digital Decade objectives and targets. **The formal adoption of the roadmap at the national level** which is crucial for the country to fully commit towards these ambitions, **is still pending**.

Portugal's roadmap partly reflects the efforts needed in all dimensions of digitalisation. The roadmap **includes only some of the expected national targets**, i.e., those related to digital skills, at least a basic level of digital intensity of SMEs, unicorns, and a joint target for the take-up of AI, cloud or data analytics, leaving space for higher ambition. The roadmap **does not include any trajectories** making it difficult to assess the pace of implementation. The national targets set for 2030 reflect EU target levels of ambition except for ICT specialists. The total budget for the measures is **EUR 854 million** (0.3 % of GDP). While the measures presented tackle some of the most pressing issues, such as the insufficient level of basic digital skills, ICT specialists, and the digitalisation of businesses, more intensive efforts are needed to reach the national targets. For the sake of the cooperation foreseen by the programme, a comprehensive roadmap perspective remains crucial also in areas where the country performs well, e.g., connectivity.

Recommendations for the roadmap

Portugal should, when submitting adjustments to its national roadmap in accordance with Article 8(3) of the DDPP Decision:

- **TARGETS:** (i) Propose targets and trajectories concerning VHCN, FTTP, 5G coverage, edge nodes, cloud, AI and data analytics separately, accessibility of key public services for citizens and businesses, access to e-health records and set trajectories for basic digital skills, ICT specialists, digital intensity of SMEs, unicorns using correct baseline value. (ii) Align the level of ambition of the target for ICT specialists with the EU target. (iii) Consider establishing national ambitions for technological leadership, competitiveness, and resilience to support EU-wide targets regarding semiconductors and quantum.
- **MEASURES:** (i) Supplement the roadmap with measures related to connectivity. (ii) Review the measures contributing to targets on skills and digitalisation of enterprises, consider setting up additional measures for ICT specialists and basic digital intensity of enterprises. (iii) Review the budget description of all presented measures, highlighting both national and EU sources. (iv) Provide more information on the implementation of digital rights and principles (and Digital Decade general objectives), including what national measures contribute to it. (v) Incorporate, where appropriate, measures reported through other channels in the roadmap.
- **CONSULTATION:** Consult key stakeholders, as outlined in the DDPP, before proposing the adjustment to the national roadmap.

Digital rights and principles

The Digital Decade Eurobarometer reveals that 43% of Portuguese respondents believe the EU protects their digital rights, slightly below the EU average of 45%. Confidence in digital privacy stands at 48%, also lower than the EU average. Concerns have risen significantly, with 60% worried about children's online safety, up 20 points since 2023, and 52% about control over personal data, up 15 points since 2023. Despite these concerns, 78% consider digital technologies important for accessing public services and 83% for connecting with friends and family, aligning with the EU average. The monitoring of the Declaration on Digital Rights and Principles shows that increasing the profile of the Declaration at national level and fostering better stakeholder engagement could help improve outcomes in the years to come⁵.

A competitive, sovereign, and resilient EU based on technological leadership

To underpin its technological leadership and competitiveness, Portugal is equipped with excellent infrastructures, with a positive deployment dynamic, but it can still boost the digitalisation of its businesses. On infrastructures, Portugal is on track to reach 100% coverage for Gigabit connectivity (VHCN 94.2%, and 92.3% for FTTP) and 5G (98.1%) much earlier than 2030, the timing set for the EU target. 65.2% of Portuguese households are covered by 5G in the 3.4-3.8 GHz band, essential for enabling advanced applications requiring large spectrum bandwidth. However, the figure for fixed broadband subscriptions with download speeds of 1 Gbps or more is 9.1%, below the EU average of

⁵ See SWD 'Digital Decade in 2024: Implementation and perspective' with annexes, SWD(2024)260: <https://digital-strategy.ec.europa.eu/en/news-redirect/833325>, Annex 4.

18.5%. Portugal's overall good starting point is due to public initiatives, such as the recent 5G auction and the ongoing Gigabit tender, combined with the dynamism of private operators. On the other hand, the indicators on the digitalisation of enterprises (basic digital intensity of SMEs and take-up of data analytics, AI and cloud) point to a performance below or equal to the EU average. SMEs are underperforming in the adoption of digital technologies, despite ample funding support offered by the Portuguese recovery and resilience plan and other sources of EU funding, and the vision established in the COMPETE 2030 programme. However, a strong agenda is in place to foster the growth of the start-up ecosystem. Portugal aims to step up its contribution to the EU's technological resilience and sovereignty with the recent strategy on semiconductors, and the revision of its strategies and actions on advanced computing and AI. A whole-of-society approach to cybersecurity skills and capabilities is also contributing to this objective.

Recommendations – Portugal should:

- **CONNECTIVITY INFRASTRUCTURE:** Ensure sufficient access of new players to spectrum for innovative business-to-business (B2B) and business-to-consumer (B2C) applications and encourage operators to speed up the deployment of 5G stand-alone core networks.
- **SEMICONDUCTORS:** Continue efforts in the area of semiconductors including by proposing concrete actions and exploring synergies between the national strategy and the EU-level cooperation.
- **DIGITALISATION OF SMEs and UNICORNS:** (i) Intensify the existing measures in view of the ambitious target on the basic digital intensity of enterprises and the need to ensure continuity of support until 2030; (ii) Continue reinforcing the country's start-up and scale-up ecosystem, in particular by ensuring availability and effectiveness of adopted measures.
- **AI/CLOUD/DATA ANALYTICS:** (i) Envisage specific measures for the take up of cloud, AI and data analytics, such as reinforced collaboration between public and private sector and with academia to better match the potential of these technologies with the business needs; (ii) Stimulate the adoption of next generation cloud infrastructure and services by companies of all sizes, including by liaising with the Cloud IPCEI Exploitation office and/or the coordinators and the Member States participating in the IPCEI-CIS.
- **CYBERSECURITY:** Continue the implementation of the 5G Cybersecurity Toolbox to ensure secure and resilient 5G networks.

Protecting and empowering EU people and society

Portugal is well equipped to deliver an inclusive digital transition, but sustained efforts will be required to continuously increase the population's level of digital skills and train ICT specialists. The population's level of at least basic digital skills is just above the EU average, showing limited progress in the past few years. The proportion of ICT specialists in employment is lower than the EU average, with a decreasing share of women in the profession. Over the last few years, Portuguese authorities devised multiple initiatives to enhance the digital skills of the population, including in the workforce; these include reforms and investments in the education system and the provision of other training initiatives. The ambition of the Digital Decade and national targets will require Portugal to further

intensify its efforts in this domain. The digitalisation of public services remains close to the EU average, while the level of e-health maturity improved significantly and is now above the EU average. With measures supporting digitalisation of the health system, implementing e-ID schemes and supporting the modernisation of public administration, Portugal is on track to achieve the EU-wide targets. At the same time, it could do more to raise awareness among the population about the benefits of the solutions in place.

Recommendations – Portugal should:

- **BASIC DIGITAL SKILLS:** Intensify efforts including by evaluating the take-up of the current measures and the remaining needs in order to meet the ambitious target.
- **ICT SPECIALISTS:** Adopt additional measures for ICT specialists, including cybersecurity talent and promoting ICT studies and gender balance in the field.
- **DIGITAL PUBLIC SERVICES/e-ID:** Continue developing user-friendly e-Government solutions and intensify efforts to promote their take-up, with particular attention to the e-ID.
- **E-HEALTH:** Make the data types of medical images and hospital discharge reports available to citizens through the online access service and, building on existing legal provisions, implement technical functionality for legal guardians and authorised persons to access electronic health data on behalf of others.

Leveraging digital transformation for a smart greening

Portugal is beginning to attach importance to twinning the digital and green transitions. The Portuguese authorities have shown growing commitment to a more sustainable future, putting in place digital measures, such as paperless invoicing or energy efficiency tracking, to support more resource-efficient public administration, enterprises and individual lives. On the objective of making the ICT sector more environmentally friendly, most of the players in the telecoms sector are carrying out sustainability reporting, which makes it possible to track improvements in the connectivity sector. However, a more comprehensive approach in this area may be necessary.

Recommendations - Portugal should:

- Develop a coherent approach to twinning the digital and green transitions. First, promote improvements in energy and material efficiency of digital infrastructures, in particular data centres. Second, support the development and deployment of digital solutions that reduce the carbon footprint in other sectors, such as energy, transport, buildings, and agriculture, including the uptake of such solutions by SMEs.
- Monitor and quantify the emission reductions of the deployed digital solutions in line with the relevant EU guidance and with the support of the methodology developed by the [European Green Digital Coalition](#), in view of future policy development, as well as of attracting relevant financing.

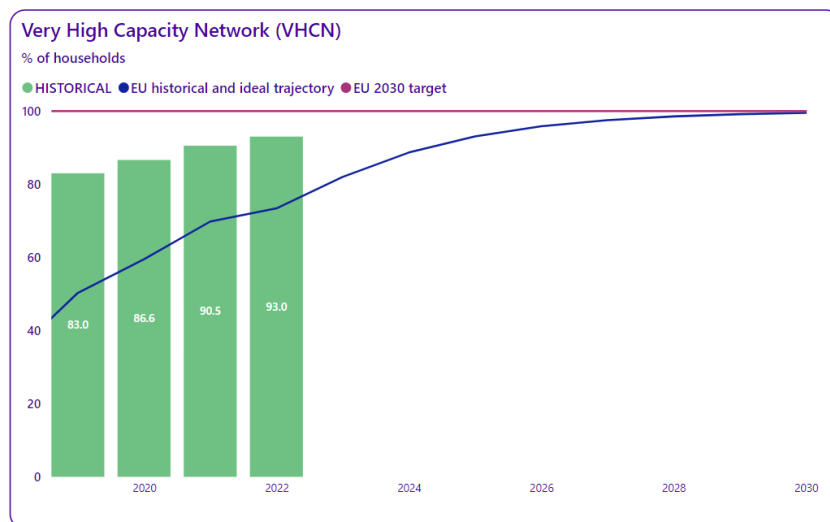
A competitive, sovereign and resilient EU based on technological leadership

With significant support from EU funds, Portugal is giving increasing attention to digitalisation to boost its productivity, competitiveness and resilience. Efforts are being made both to foster the growth of the digital start-ups ecosystem and to bring digital technologies to enterprises operating in other sectors of the economy. This transformation is possible thanks to an excellent gigabit infrastructure and 5G coverage that reaches almost 100% of the territory. With important investments in cybersecurity competences and tools, the government is increasingly contributing to ensuring sovereignty and resilience of both the economy and the public administration.

Building technological leadership: digital infrastructure and technologies

Portugal has been very active in deploying connectivity infrastructures, translating into a good starting point for reaching the 2030 target. Both gigabit and 5G networks should reach 100% coverage earlier than 2030, making it possible to decrease the geographical divides in a territory with sizeable rural areas. Portugal is also developing strategies to boost the potential for innovation in the most advanced technologies.

Connectivity infrastructure (Gigabit)

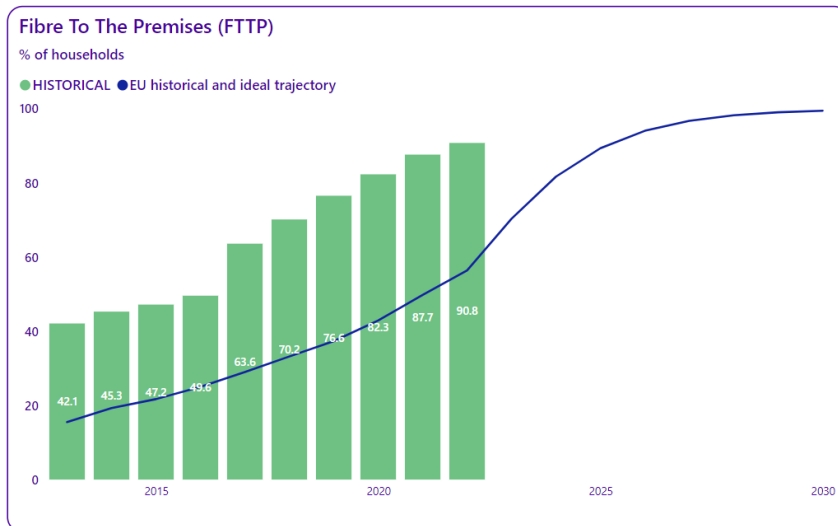


2023 state of play and recent progress

	Country level	EU level
FORECAST		82.0
DESI 2024	94.2	78.8
AVERAGE ANNUAL GROWTH %	1.2	7.4

Average, annual growth is computed between the two most recent available data points

Note: The source of national forecast values is the 2023 country roadmap



2023 state of play and recent progress

	Country level	EU level
FORECAST		70.3
DESI 2024	92.3	64.0
AVERAGE ANNUAL GROWTH %	1.7	13.5

Average, annual growth is computed between the two most recent available data points

Note: The source of national forecast values is the 2023 country roadmap

Portugal brings a very positive contribution to the EU’s Digital Decade gigabit target and shows a positive dynamic for its last stretch to achieving it. The Very High-Capacity Network (VHCN) and Fibre to the Premises (FTTP) coverages are both well above the EU average. At 94.2%, VHCN coverage is very high and well above 78.8% at the EU level. At 92.3%, FTTP coverage is almost a third higher than the EU level value of 64.0%. The annual growth rate was positive, with 1.7% for FTTP deployment and 1.2% for VHCN. VHCN rural coverage (71.4%) is also higher than the EU average (55.6%), showing that efforts to close the gap between urban and less populated areas are bearing fruit. Portugal’s good performance is further evidenced by the fact that 89.7% of households with fixed broadband subscriptions enjoy internet with download speeds of 100 Mbps or more. 9.1% of households have fixed broadband subscriptions with download speeds of 1 Gbps or more, lower than the EU average of 18.5%.

Portugal has not presented a national target to achieve gigabit connectivity for all. However, at its current performance, Portugal is already contributing significantly to reaching the EU target of 100% fibre VHCN by 2030 and can reasonably expect alignment with the EU level of ambition. Nevertheless, the inclusion of a trajectory and measures in the roadmap could not only guide the efforts on the last stretch to full coverage but also give example to the Member States which progress more slowly.

Recent developments are keeping Portugal on the right path to ensuring gigabit connectivity across its territory. At the end of 2023, Portugal launched a public tender for the installation, management and operation of VHCN providing download speeds of at least 1 Gbps and upload speeds of at least 150 Mbps in white areas. Some 417 000 residential and non-residential premises should be covered by this investment. Approximately half of the total amount of investment, EUR 172 million, has already been approved for this purpose under EU State aid rules. The identification of white areas was facilitated by [GEO.ANACOM](#), a platform operating since October 2023 and containing geographic information on network coverage. VHCN installation will need to be completed within 3 years in line with an accumulated coverage rate of buildings for each year.

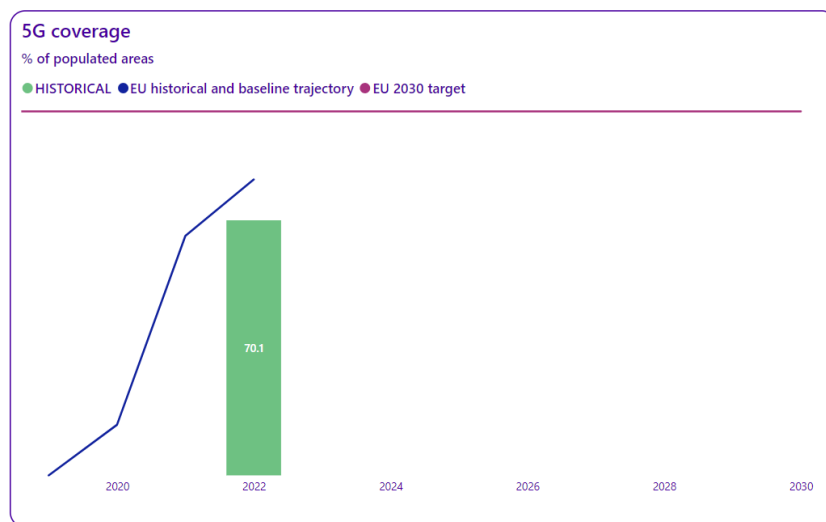
To foster effective competition and incentivise further roll-out of networks, in December 2023 ANACOM, the Portuguese electronic communications regulator adopted a number of decisions. These were: (i) a decision on the analysis of the markets for access to physical infrastructures, wholesale local access at a fixed location and wholesale central access at a fixed location; (ii) a decision on the analysis

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of the market for wholesale access to dedicated capacity; (iii) a decision on the analysis of electronic communications markets for leased lines' trunk segments.

With its steady development and good starting point, Portugal is in a very favourable position to achieve the gigabit (VHCN and FTTP) coverage targets within the timeframe of the Digital Decade. Setting a clear trajectory as well as embedding existing and new measures in the roadmap to achieve 100% gigabit connectivity could help support this goal.

Connectivity infrastructure (5G)



2023 state of play and recent progress

	Country level	EU level
FORECAST		
DESI 2024	98.1	89.3
AVERAGE ANNUAL GROWTH %	40.0	9.8

Average, annual growth is computed between the two most recent available data points. No ideal trajectory, and therefore no EU level forecast, is provided for 5G (see 2023 Communication on EU-level trajectories)

Note: The source of national forecast values is the 2023 country roadmap

Portugal brings a positive contribution to the EU's Digital Decade target for 5G, while demonstrating a very strong dynamic. At 98.1%, the 5G coverage in Portugal is well above the EU average of 89.3%. With 40% annual growth since last year's report, when the country scored below the EU average, 5G deployment is very intensive, even compared to the average annual growth in the EU, which is equal to 9.8%. In 2023, 5G in the 3.4-3.8 GHz band, essential for enabling advanced applications requiring large spectrum bandwidth, covered 65.2% of Portuguese households, a figure above the EU average of 50.6%.

Portugal has not presented a target value for 5G. At the same time, with the recent progress and a generous starting point, it is already very close to reaching the EU target of 100% 5G coverage. Hence, Portugal can easily meet the highest level of ambition.

Significant private investment has been made in mobile network coverage. In accordance with the obligations of the 5G auction concluded in 2021, by the end of 2024 all low-density parishes and all parishes in the autonomous regions of Madeira and Azores should have improved in their mobile network coverage. This should translate into mobile broadband provision for each of those parishes of a mobile broadband service with a speed of 100 Mbps (NOS and Vodafone) and 50 Mbps (MEO), covering at least 75% of the parish's population. By the end of 2025, the coverage of these territories is expected to be of at least 90%.

Portugal is contributing to the implementation of 5G cross-border infrastructure. In January 2023 the European Commission awarded two **5G cross-border corridor** projects between Spain and Portugal (Salamanca-Porto-Vigo and Mérida-Évora). The work will be completed by the end of 2025, paving the way for connected vehicles, more efficient emergency and logistics operations, and 5G services for

drivers and passengers in rural areas. These infrastructures are seen as pivotal to boost connected and automated mobility and to strengthen the digitalisation of rail operations.

In view of its excellent performance and high probability to achieve the Digital Decade target for 5G, Portugal's inclusion of a national target, a trajectory and the relevant measures in the roadmap could not only guide its final efforts towards full coverage but also serve as an example to Member States that are progressing more slowly.

Semiconductors

Semiconductors are becoming a priority for Portugal. At the end of 2023 the [Portuguese Strategy for Semiconductors](#) was approved with a maximum national budget of EUR 121 million for 2024-2027. These ambitions were not included in the roadmap.

Portugal is also involved in European initiatives related to semiconductors. Two Portuguese private companies are participating in the important project of common European interest (IPCEI) on Microelectronics and Communication Technologies. In addition, the Portuguese Foundation for Science and Technology (FCT) continues to participate in the newly established **Chips Joint Undertaking**, funding national beneficiaries with winning bids in this partnership.

With its new strategy, Portugal can contribute to the EU's objective of sovereignty in the semiconductors sector. The State of the Digital Decade report 2023 encouraged Portugal to sustain its efforts on semiconductors in order to help the EU become a strong market player in that area. The national strategy is an important step towards addressing this recommendation.

Edge nodes

Portugal has deployed an estimated 19 edge nodes out of 1186 in the EU in 2023. Despite edge computing being a critical enabler of AI, future networks roll-out, and the Internet of Things, for the time being, no national trajectory was set for edge nodes in the Portuguese roadmap to contribute to the EU target of 10 000 climate-neutral and secure edge nodes.

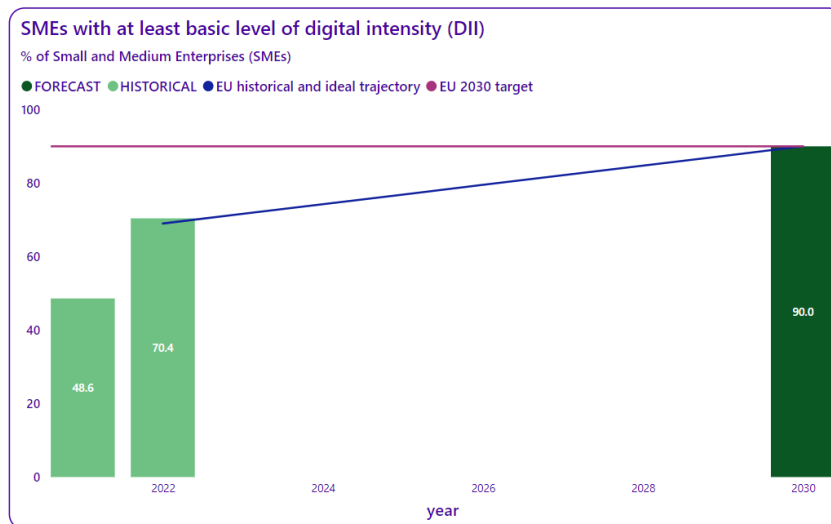
Quantum technologies

Portugal is actively participating in the European High-Performance Computing Joint Undertaking (EuroHPC), including on quantum. As part of EuroHPC, **Deucalion**, a petascale supercomputer installed at the Minho Advanced Computing Centre (in the municipality of Guimarães, Portugal) was inaugurated in 2023. In 2024, the first EU and Portuguese projects will be tested on the supercomputer, with a focus on AI and quantum. Portugal is also a partner in the **Mare Nostrum 5** pre-exascale supercomputer in Barcelona, with national researchers applying to use the shared European quantum computing resource. Supporting the operation of the two supercomputers will be possible thanks to a new investment entitled '**More Digital Science**', included in the November 2023 revision of the national recovery and resilience plan (RRP). This investment includes also establishing the National Advanced Computing Centre (CNCA) to enable more efficient work with the supercomputers, encourage research and development and pool human resources for this purpose. As part of EuroHPC, Portugal is committed to the **European Quantum Communication Infrastructure (EuroQCI)** initiative and is setting up national ultra-secure quantum communications technology infrastructure covering mainland regions, and the autonomous regions of Azores and Madeira, thereby expanding the EU network.

Supporting EU-wide digital ecosystems and scaling up innovative enterprises

Portugal has adopted ambitious digitalisation of business targets and a range of measures to use technology to unleash the potential of its enterprises. The measures help SMEs develop basic digital intensity and adopt advanced technologies. They also aim to foster growth of start-ups.

SMEs with at least basic digital intensity



2023 state of play and recent progress

	Country level	EU level
FORECAST		71.6
DESI 2024	53.6	57.7
AVERAGE ANNUAL GROWTH %	5.0	2.6

In the case of DII, the average, annual growth is computed between 2023 and 2021 due to data comparability reasons.

Note 1: DII 2022 is version IV that is not comparable with DII 2021, that was version III. The EU-level ideal trajectory refers to DII version IV, as published in the 2023 Communication on EU-level trajectories

Note 2: The source of national forecast values is the 2023 country roadmap

Portugal has untapped potential to contribute to the EU's Digital Decade target on digitalisation of SMEs while showing positive dynamic. With 53.6% of SMEs having at least a basic level of digital intensity, Portugal performs slightly lower than the EU average (57.7%). This represents annual growth of 5.0% over 2 years since 2021, the last comparable year that used a similar methodology to measure the digital intensity of enterprises. This progress is above the 2.6% average observed in the EU. In addition, around 16.5% of Portuguese SMEs sell online, below the EU average of 19.1%.

With the national target value of 90%, Portugal has demonstrated ambition equivalent to the EU target. However, no trajectory was presented. Taking into account the current rate of progress and an average starting point, reaching the target by 2030 would require a strong intensification of efforts.

Following the revision of Portugal's RRP in November 2023, the budget for several measures for enterprises was increased. The revision scales up the investment in Digital Commerce Neighbourhoods with an additional EUR 25 million. The measure supports shopping areas located in urban centres, suburban or rural areas by providing them with digital infrastructure and digital solutions. New investments benefiting enterprises in Madeira and Azores were also introduced. In addition, the RRP now aims to support 200 industrial research projects, experimental development, and organisational or process innovation. By the end of 2023, EUR 575 million from the Recovery and Resilience Facility (RRF) had already been allocated to digitally empower Portuguese enterprises.

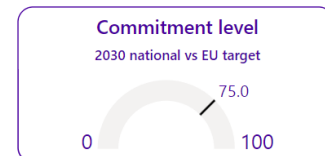
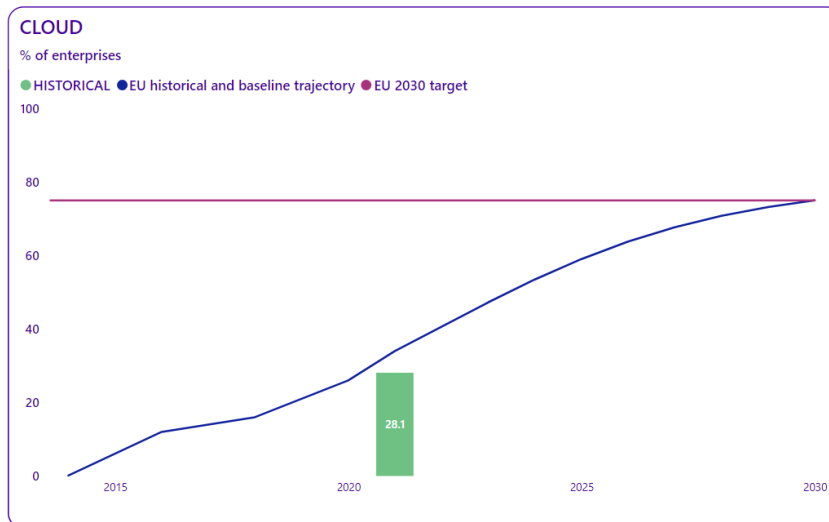
The RRF support to businesses is also reflected in the Portuguese roadmap. The roadmap's narrative revolves around investments focusing on basic digital intensity of enterprises (through Digital Commerce Neighbourhoods and Digital Commerce Accelerators), development, testing and use of disruptive or advanced technologies (through the national test beds network and Digital Innovation

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Hubs (DIHs) or related to both of the above targets (vouchers for companies). Overall, the measures complement each other well. They are also complemented by **COMPETE 2030**, a national programme to boost competitiveness of Portuguese businesses, supported by, among other things, EUR 40 million from the Digital Europe programme. The investments' duration is significantly shorter than 2030, with some measures ending already in 2025. This might be worth addressing to ensure continuous support of Portuguese enterprises and their competitiveness on the road to 2030 and beyond.

Take up of cloud/AI/data analytics

- **Cloud**



2023 state of play and recent progress

	Country level	EU level
FORECAST		47.3
DESI 2024	32.3	38.9
AVERAGE ANNUAL GROWTH %	7.2	7.0

Average, annual growth is computed between the two most recent available data points

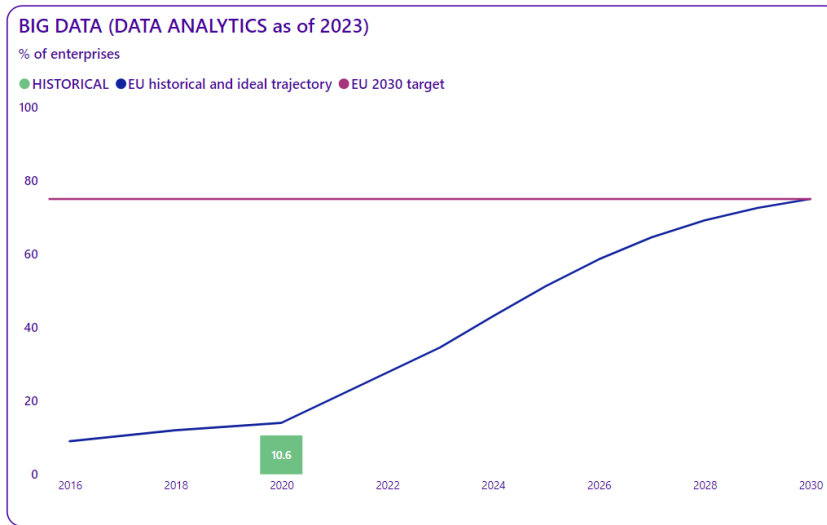
Note: The source of national forecast values is the 2023 country roadmap

Portugal has untapped potential to contribute to the EU's Digital Decade target for cloud adoption and demonstrates a positive dynamic. At 32.3%, the take-up of cloud solutions by Portuguese enterprises is below the EU average (38.9%) but slightly exceeds its growth pace (7.2% in Portugal, versus 7% in the EU).

The Portuguese roadmap does not set a separate target for cloud adoption and does not present dedicated measures to foster the adoption of cloud computing by enterprises. However, Portugal could rely on existing general measures to foster cloud uptake and innovation, for example through the RRF-sponsored Digital Commerce Accelerators, entities that provide coaching, mentoring and funding support to start-ups and SMEs.

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Data analytics (Big Data)⁶



2023 state of play and recent progress

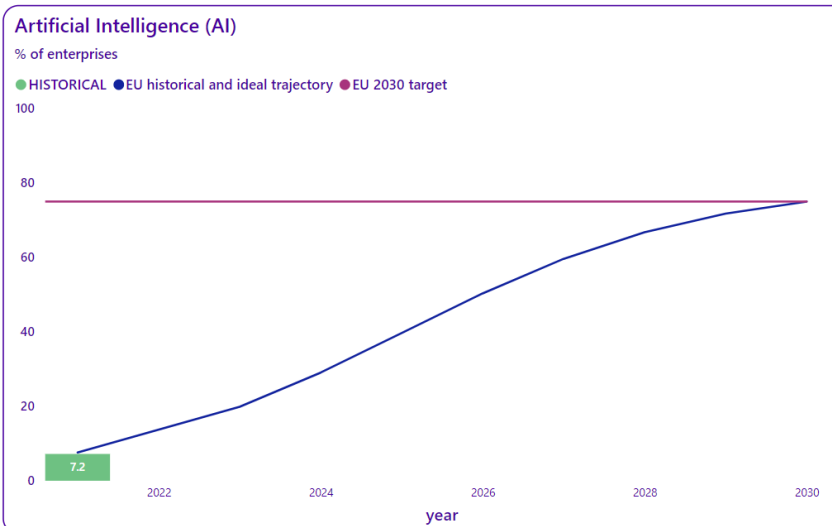
	Country level	EU level
FORECAST		34.6
DESI 2024	38.6	33.2
AVERAGE ANNUAL GROWTH %		

Annual growth cannot be computed in this case because Big Data was replaced by Data Analytics in 2023. The two indicators are not comparable.

Note: The source of national forecast values is the 2023 country roadmap

On the use of data analytics by enterprises, Portugal brings a positive contribution to the EU's Digital Decade target, without assuming its own data analytics target. At 38.6%, Portuguese enterprises use data analytics tools more than their European counterparts (EU average: 33.2%). However, progress cannot be assessed since the definition of this indicator has changed

Artificial Intelligence



2023 state of play and recent progress

	Country level	EU level
FORECAST		19.9
DESI 2024	7.9	8.0
AVERAGE ANNUAL GROWTH %	4.7	2.6

Average, annual growth is computed between the two most recent available data points.

Note 1: at the end of 2023 ESTAT revised backward the values of AI. The revised value for 2021 at the EU level is 7.6 % (from 7.9 %).

Note 2: The source of national forecast values is the 2023 country roadmap

Portugal brings a positive contribution to the EU's Digital Decade target for AI adoption and shows a positive dynamic. Few Portuguese enterprises are adopting AI solutions, posting a share of 7.9% in 2023, in line with the EU average of 8%. However, at 4.7%, Portugal's annual growth dynamic for is significantly higher than the EU average (2.6%).

⁶ As of 2023, Eurostat changed the Big Data into a Data Analytics indicator. For this reason, no comparison is possible with previous years.

The Portuguese roadmap does not set a separate AI adoption target but it presents measures that may foster the adoption of AI by enterprises. The **National Digital Innovation Hubs Network**, an ongoing investment funded by the RRF (until 2025) and the Digital Europe programme (until 2027) is intended to be an effective instrument for the digital transformation of companies and the public sector, providing testing, training, funding and incubation support. The technological aspects of the network focus on AI, high-performance computing and cybersecurity and, to a lesser extent, other technologies relevant to the digital transition process of SMEs and public administration. Currently 14 out of 17 DIHs provide services in AI, as it is the case also for almost all the test beds in Portugal. In addition, to a lesser extent, test beds and DIHs support the use of opportunities coming from data analytics, allowing for synergies between advanced technologies for businesses.

Additional opportunities for more comprehensive support may arise. The **National Artificial Intelligence Strategy** is currently being reviewed. This, along with an action plan in preparation, creates an opportunity to provide stronger support for safe and responsible AI uptake by enterprises.

- **Take-up by enterprises of AI or Data analytics or Cloud**

Taking the three technologies together (adoption of either AI, Cloud, or Data analytics), Portugal's performance stands at 54.4%, just around the EU average of 54.6%. Overall, Portugal has untapped potential to contribute to this Digital Decade target. The level of ambition presented by Portugal in its roadmap is equal to the joint target of the EU, namely 75% of enterprises adopting one of the three: AI, cloud, or data analytics. Reaching this target by 2030 will require from Portugal sustained effort.

Unicorns/scale-ups/start-ups

Portugal has been making efforts to build a start-up friendly ecosystem. As part of the RRF investments, the country launched the start-up ecosystem mapping platform that is accessible via the [Startup Portugal](#) portal. The aim is to map 5 000 companies by 2025, thus facilitating identification of their scale-up potential as well as matching with investors, accelerators and public organisations. In addition, Startup Portugal provides information about other dedicated RRP measures, such as vouchers for start-ups and incubators and is included in the vision presented in the roadmap.

To bolster the start-up ecosystem, the [‘Start-ups Law’](#) was adopted in May 2023. The law introduces legal definitions of start-ups and scale-ups and establishes a tax incentives system aimed at promoting innovation and entrepreneurship. Its results remain to be seen in practice.

Currently Portugal counts one unicorn and has adopted the Digital Decade target of doubling the number of unicorns in its roadmap. To meet these ambitions, it plans to boost its innovative scale-up ecosystem by improving scale-ups' access to funding.

Strengthening Cybersecurity & Resilience

As companies rely increasingly on digital technologies, their risk of exposure to cybersecurity incidents is increasing, as is their need for preparedness in this area. In 2022 89.8% of Portuguese SMEs had some ICT security measures in place (EU average 91.8%). In the same year, a small proportion of all enterprises (11.3%) reported being insured against ICT security incidents (EU average 25%).

The **National Cyberspace Security Strategy 2019-2023** is a key policy measure for enhancing cybersecurity and resilience with a whole-of-society approach encompassing domains such as cybersecurity, cyberdiplomacy, cyberdefence and fighting cybercrime. The implementation of its action plan is monitored by the National Cybersecurity Centre (CNCS; the national cybersecurity

authority and national cybersecurity certification authority). The CNCS is also responsible for multiple initiatives in the field funded under the RRP. The **C-Academy**, described in more detail in the section below on ICT specialists, is an advanced training for cybersecurity skills. The **Cybersecurity Competence Centres Network (C-Network)** aims to create a nationwide network of complementary 'one stop shops' designed to provide local guidance and services to the public administration, SMEs and other entities. The **Cybersecurity Digital Innovation Hub (C-Hub)** will foster research and development and introduce cybersecurity innovation and processes in the digital transformation of enterprises and public administration. These initiatives will come fully on stream in 2024, creating an environment conducive to cyber maturity and resilience.

Portugal is investing in raising the public's risk-awareness. With online courses offered by CNCS since 2019 on the National Platform for Mass Online Courses (the *NAU* platform), everyone can learn about secure interactions as a consumer or social media user, along with privacy considerations, thereby maintaining 'cyber hygiene'. The Portuguese authorities reported a strong interest outside Portugal, with Portuguese speakers outside the EU subscribing to the courses. The monitoring by the [Cybersecurity Observatory](#) enables public bodies, stakeholders and individuals to stay up to date with the cybersecurity landscape and align their efforts to foster cybersecurity.

Security of electronic communications infrastructure is a concern for the national administration and market players. Following an evaluation by the public authorities, telecom companies are investing significant sums in replacing equipment to comply with the security requirements set out in the EU 5G Cybersecurity Toolbox. Some of those companies work together with the CNCS also on the '[Cybersecurity Alliance](#)' which gathers large economic operators across various sectors to promote a national culture of cybersecurity.

The Portuguese authorities consider that international collaboration is key to achieving collective resilience. Portugal participates in a consortium involving Spain, Italy, Luxembourg, Romania, The Netherlands, and Austria to implement the **ENSOC-CROSSBORDER PLATFORM**, a cross-border platform to improve the detection of cybersecurity threats and share cybersecurity data in the EU. The consortium responded to a call for expression of interests in 2023. The project, which received initial support of EUR 5 million under the Digital Europe programme, will strengthen common capacities to detect, analyse and prevent cyberthreats. The ENSOC platform, which started operations on 1 January 2024, is expected to contribute to EU leadership and strategic autonomy in the field of cybersecurity.

Protecting and empowering EU people and society

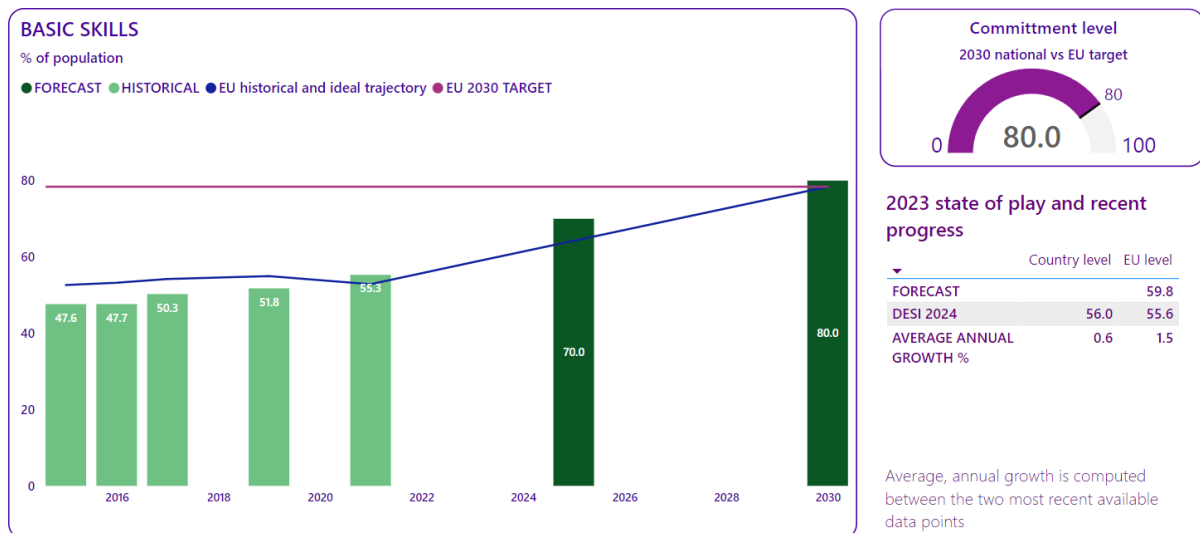
Empowering people and bringing the digital transformation closer to their needs

Digital education and digital inclusion are priorities for Portugal. The INCoDe 2030 initiative and investments under the national RRP and other EU funds focus on improving the digital skills of the Portuguese population across generations, to ensure no one is left behind in the digital transformation and to create a future-proof job market. By improving the population’s skills in areas ranging from media literacy to cybersecurity knowledge, Portugal also aims to support a trusted and secure online environment. However, shortage of ICT specialists and the gender gap in this sector remain issues and require further action. In recent years, significant attention has been paid to the digitalisation of public services, including in the health sector. Many measures have already been implemented and innovative projects are ongoing, such as a generative AI virtual assistant for public services.

According to the Digital Decade Eurobarometer, 74% of the Portuguese population considers that the digitalisation of public and private services is making their daily lives easier; this figure is similar to the EU average (73%). However, the same survey found that only 62% of them think that by 2030 digital technologies will play an important role in accessing education and training opportunities, a figure below the EU average (75%). Perspectives on the importance of digital technologies for accessing or receiving healthcare services (77%) and accessing public services online (78%) remain slightly below the EU averages (79% and 83% respectively).

Equipping people with digital skills

Basic Digital Skills



Note 1: Data break-in-series in 2020

Note 2: The source of national forecast values is the 2023 country roadmap

Portugal has untapped potential to contribute to the EU’s Digital Decade target of 80% of the population having at least basic digital skills. With 56% of the Portuguese population having at least basic digital skills in 2023, Portugal ranks just above the EU average of 55.6%. However, there is a

limited dynamic in this indicator as the growth rate of 0.6% since 2021 is slower than the EU rate (1.5%) over the same period. On the other hand, 29.9% of people in Portugal have above-basic digital skills, slightly more than the EU average value of 27.3%.

Portugal is committed to enhancing the digital skills of its population. Investments and reforms presented for this purpose in the national roadmap fall under the national recovery and resilience plan or the National Digital Skills Initiative [INCoDe 2030](#)⁷, partly funded by the European Social Fund. Many out of the more than 20 measures envisaged by the roadmap target specific demographics. One example is **'I Am Digital' (Eu Sou Digital)**, a programme directed at promoting the digital inclusion of adults, based on a national network of young volunteers and training centres. The programme content includes, among others, the creation and management of e-mail accounts, how to search online, how to consult and use digital public services and how to access services such as home-banking or social networks. Since its launch in 2021, the programme has trained 12 975 people, calling on the support of more than 6 532 mentors registered and certified for this purpose and working at a total of 255 centres across the country. The programme's ambition was to train 200 000 adults by 2023. One example of an initiative offering skills opportunities to youth is **'Young + Digital' (Jovem + Digital)**, a training programme targeted at unemployed young adults aged between 18 and 35, the aim being to increase their employability through the acquisition of digital skills. Since 2020, 20 609 young people have been trained.

Portugal also puts emphasis on the digital transformation of formal education. The **'Digital School' (Escola Digital)** programme, funded by the RRF, was launched to guarantee universal distribution of computers with an internet connection, train teachers and provide digital educational materials. By the end of 2023, 1 050 000 laptops had been purchased for loan to teachers and students in public primary and secondary schools, 94 515 public school teachers were trained in basic or more advanced digital skills and 2 000 classrooms equipped with new projectors. Moreover, Portugal promotes initiatives targeted at the acquisition of specific digital skills from early years. The **'ubbu'** project promotes digital literacy, by teaching competences such as problem-solving and programming. It uses new learning methods, provides teacher training and teaching materials. In 2023, the project reached 49 200 young people and 1 500 teachers.

The general public in Portugal can improve its intermediate and advanced digital skills through online training courses. 13 massive open online courses (MOOCs) are freely available on the *NAU* platform to all, whether individuals, institutions, or companies. By September 2023, 25 860 people had signed up for these courses and 237 473 users were registered on the platform.

The 'Digital Spot' (Ponto Digital), the Portuguese part of the Digital Skills and Jobs platform, is a national repository of initiatives, actions, studies, resources, events, news, training, jobs, and financing opportunities in the field of digital skills. By the end of 2023, 92 digital training initiatives had been published on the platform, along with 1 179 training actions. An advertising campaign launched at that time exponentially increased the number of visitors to the Digital Spot.

Despite extensive action in this field, given Portugal's current progress rate, it might not achieve its target by 2030. The national target is set at 80%, which is in line with the EU target for 2030. The target value is based on the indicators set out under the INCoDe 2030 programme. As a result, the presented KPI differs from the Digital Decade one in terms of baseline value. The roadmap includes an

⁷ Established in 2017, INCoDe 2030 as an inter-ministerial programme that encompasses boosting digital skills in formal and informal education, for businesses and public administration, responding also to general objectives of the Digital Decade and aligned with other digital national initiatives.

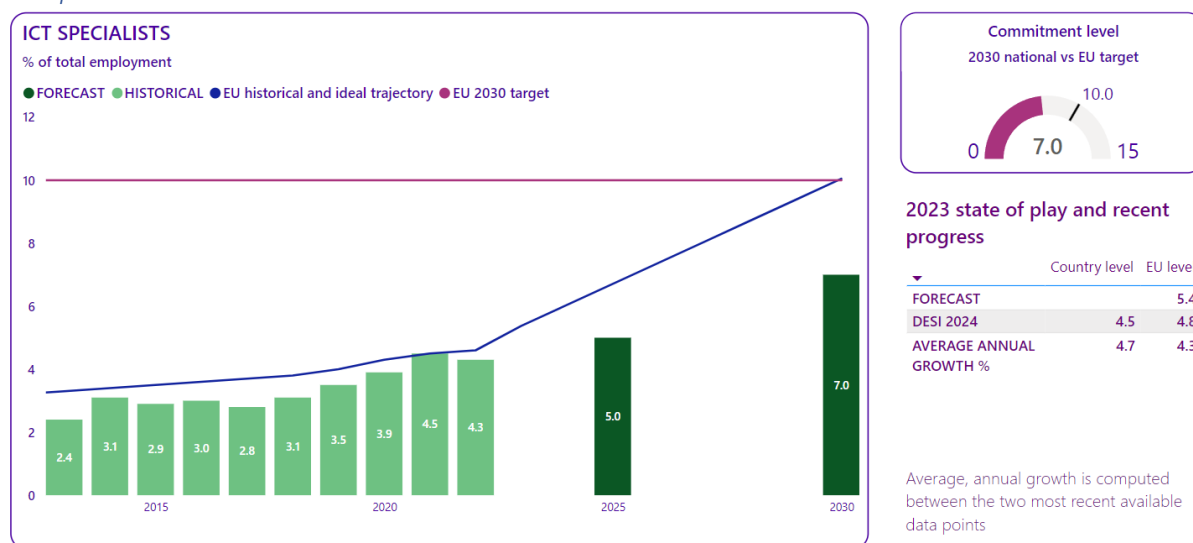
Portugal

intermediate target of 70% for 2025 but does not include national trajectories. In any case, at Portugal's current rate of progress, reaching the target by 2030 would require intensified efforts towards empowering the public and equipping them with the skills necessary for a successful digital transformation.

The roadmap measures supporting basic digital skills will largely contribute to the target until 2030 or until the end of RRF funding in 2026. While most of the measures are old, one new measure is the [Digital Skills Observatory](#). It monitors the INCoDe.2030 programme, using selected indicators to monitor the evolution of digital skills in Portugal. The roadmap measures are directed towards a diversified audience ranging from students and teachers to employees at various management levels, the unemployed, and employees in the public administration. The roadmap acknowledges the challenge of digital inclusion across the country's territory. The measures seem to target people across demographics in line with the 2023 State of the Digital Decade report's recommendations. However, it might be useful to evaluate why some of the measures like 'I am digital' have had a rather modest take-up compared to envisaged targets, and to adjust them accordingly.

Given Portugal's current performance and dynamic, the measures reported in its roadmap might require intensification. This could start with stronger promotion activities and implementation to meet the level of ambition of 80% of the population having at least basic digital skills.

ICT specialists



Note: The source of national forecast values is the 2023 country roadmap

Portugal has untapped potential to contribute to the EU's Digital Decade target for ICT specialists. The number of ICT specialists in Portugal in terms of their share of employment is 4.5%. This is slightly below the EU average of 4.8% but **shows a positive dynamic**. The figure represents a growth of 4.7% from last year, on a par with the progress observed on average across the EU (4.3%). In absolute numbers, Portugal hosts 220 200 ICT specialists, 10 100 more than last year. Women account for 20% of ICT specialists, showing a slight downward trend (DESI 2023: 20.3%; DESI 2022: 21%) but remaining above the EU average (19.4%). The number of ICT graduates in Portugal remains one of the lowest in the EU, with 2.5% students graduating from ICT studies, same percentage as last year.

Portugal continues implementing programmes aimed at the qualification of ICT specialists, as mentioned in the 2023 report. The 'UpSkill' programme aims to convert employed or unemployed people into ICT professionals through intensive theoretical training of 6 to 9 months, followed by

practical training and professional integration into a company. The 2023 edition had 485 candidates selected and 31 companies involved, slightly down compared to the previous two editions, which involved 1 232 candidates and 102 companies altogether. The ‘**C-Academy**’ training programme funded by the RRF provides advanced skills to new cybersecurity and information security specialists from both the public administration and the private sector. Offering 44 courses in various formats, in 2023 its pilot version certified 116 people, with the ambition to train 9 800 by the first quarter of 2026.

The 2030 target established by Portugal for ICT specialists is 7%, which is lower than the 10% target value for the EU. Portugal has a 5% intermediate target for 2025 but no trajectory. The country has also an additional target of 30% of women among total ICT specialists in employment by 2030 and 20% in 2025. In accordance with the INCoDE 2030 indicators incorporated into the roadmap, Portugal also adopted an 8% target for ICT graduates.

Portugal is still developing its vision on training and attracting ICT specialists. New measures are reforms rather than investments, as they involve preparation and monitoring of national strategies and action plans. The Advanced Computing Portugal 2030 and the National Artificial Intelligence Strategy are undergoing review. Both strategies include strengthening of qualifications and retention of students, managers, and employees in the public administration or private companies, thanks to strengthening of their digital skills, especially advanced computer skills and those involving AI technologies. The strategies on data and Web 3.0 are under preparation and can be expected to refer to professionals in these areas. The roadmap measures are programmed to last mostly until 2030 (two until 2026). The Portuguese authorities are aware of the challenge involved in achieving a high and gender-equal number of ICT specialists but there are no measures designed to tackle this issue, such as a measure targeted at increasing the number of ICT graduates.

The recommendations from the 2023 State of the Digital Decade report remain valid; efforts are still needed to increase enrolments in ICT studies and incentivise future ICT specialists. This will involve targeted actions, for example providing scholarships and other funding.

Key digital public services and solutions – trusted, user-friendly, and accessible to all

e-ID

30.4% of Portuguese population used e-ID for private purpose within the last 12 months, markedly less than the EU average (41.1%). The two Portuguese e-ID schemes: Digital Mobile Key (DMK) and Citizen Card (e-ID card) both provide a high level of assurance compliant with the Regulation (EU) 910/2014 on electronic identification (eIDAS Regulation). From January 2023, the Digital Mobile Key can be activated using biometrics. Currently there are more than 3.3 million active DMKs. Access to a growing number of public services can be facilitated through the ID.gov application. For example, since October 2023, the app can be used to automatically renew the driving licence - licence holders receive a notification 5 months before the expiry date and only need to pay for the renewal, receiving the new licence in the app and the physical card by post. In December 2023, new legislation was adopted, clarifying the equal legal and probative value of documents presented through the ID.gov application. Efforts are being made to make digital signature (Professional Attributes Certification System (SCAP)) available to all public servants.

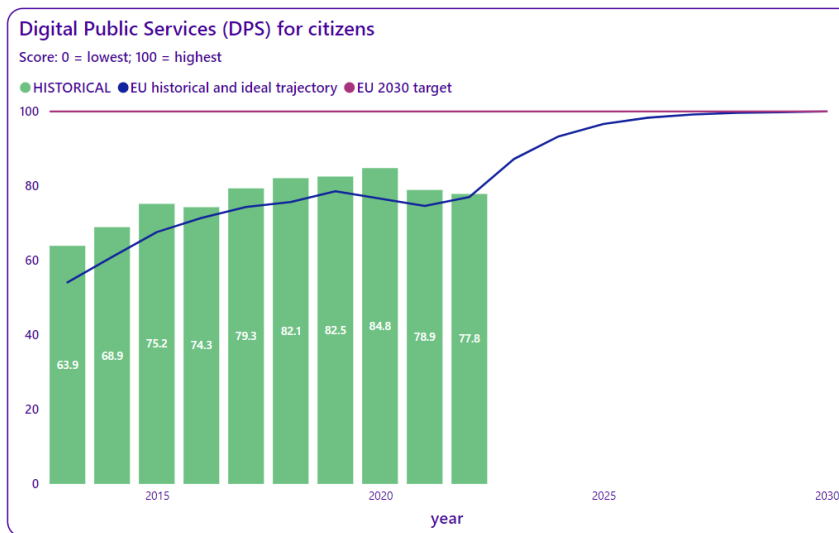
Portugal participates in the European consortia POTENTIAL (PiLOTs for EuropeaN digiTal Identity wAllet) and DC4EU (Digital Credentials for Europe). The POTENTIAL consortium, which has received EUR 16 million in EU subsidies (through the Digital Europe programme), is a ‘large scale pilot’ aimed at piloting a prototype European Digital Identity Card through six use cases, of which Portugal has been actively participating in five: authentication in digital public services (national and cross-border);

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opening a bank account, mobile driving licence/vehicle rental; qualified remote signatures; and e-health/e-prescription.

The goal of widespread adoption of digital identity in Portugal is supported by six roadmap measures. Those measures are part of the national RRP with their total budget of almost EUR 25 million. According to the roadmap, a similar amount will be needed after the RRP funding to continue seamless functioning of the e-ID scheme.

Digitalisation of public services for citizens and businesses



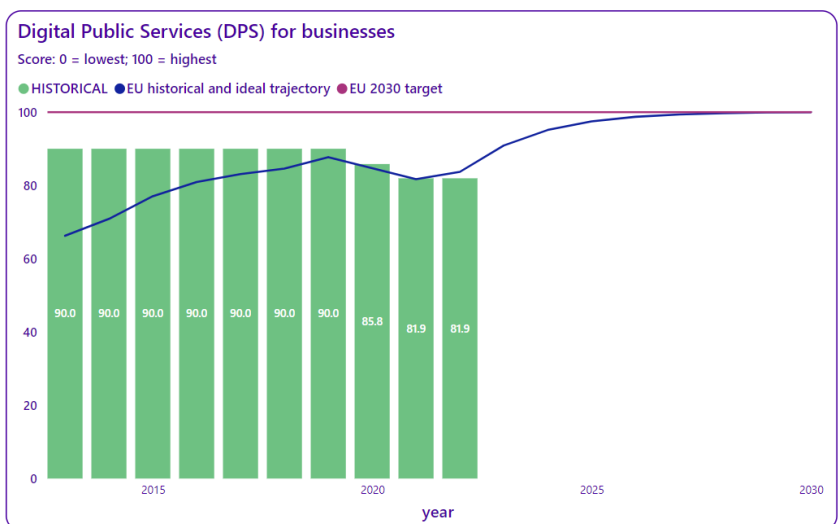
2023 state of play and recent progress

	Country level	EU level
FORECAST		87.2
DESI 2024	81.5	79.4
AVERAGE ANNUAL GROWTH %	4.8	3.1

Average, annual growth is computed between the two most recent available data points

Note 1: Data break-in-series in 2020

Note 2: The source of national forecast values is the 2023 country roadmap



2023 state of play and recent progress

	Country level	EU level
FORECAST		90.9
DESI 2024	81.9	85.4
AVERAGE ANNUAL GROWTH %	0.0	2.0

Average, annual growth is computed between the two most recent available data points

Note 1: Data break-in-series in 2020

Note 2: The source of national forecast values is the 2023 country roadmap

Portugal brings a rather positive contribution to the EU's Digital Decade target for digital public services while also showing positive dynamic. On public services for citizens (81.5), Portugal ranks above the EU average both in absolute value (79.4) and annual growth (4.8% in Portugal versus 3.1% for the EU as a whole). On public services for businesses, Portugal has untapped potential to contribute the target, as it ranks below the EU average (81.9 versus 85.4) and stagnated compared to last year.

To further support the population in accessing public services online, in May 2023 the generative AI Virtual Assistant (VA) pilot was launched on ePortugal, the Portuguese single digital gateway. Based on ChatGPT 3.5 turbo, an avatar answers in writing and by voice to queries from the public on e-ID questions. Since its launch, e-ID activations have increased by 10%. Currently interacting in Portuguese, the next phases involve availability in 16 languages and an ‘omnichannel’ character, i.e., redirection to a human assistant. The aim is to expand the number of services supported. In addition, intensive efforts are under way to promote inclusive digital services. 2023 saw the creation of an ecosystem of web accessibility evaluation tools, such as (i) the **Portuguese Observatory of Web Accessibility**, which enables public bodies to monitor their websites; (ii) the **Accessibility Declaration Generator**, which helps entities publish the mandatory declarations; (iii) the **Access Monitor** which is a web accessibility evaluator. These tools help public bodies comply with EU law, follow best practices, and enhance user experience.

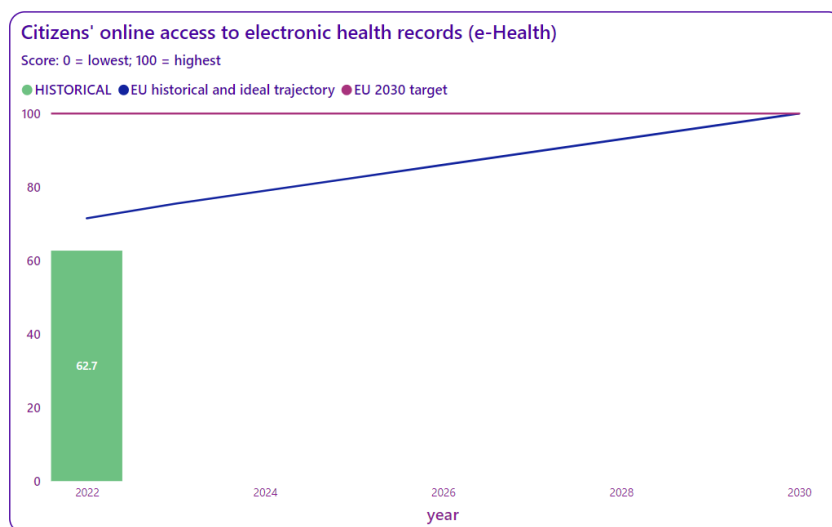
To relieve administrative burden in the registration of new businesses, the ‘Enterprise 2.0’ (Empresa 2.0) project was launched. The platform can be used to set up single-member limited companies, limited liability companies and public limited companies, using pre-filled information on the members. Having agreed to participate in the new company, future members only need to authorise the use of their data in the public administration databases, ensuring a fully digital experience.

Portugal shows commitment to collaborating with other Member States to improve public services online. In 2023 it actively participated in the Horizon 2020-funded **Digital Europe for All (DE4A) consortium** that aims to facilitate migration towards European digital public services co-delivered across borders.

Portugal has not set a national target value for its contribution to the EU level target of 100% digital public services by 2030. Despite the rather positive current growth in digitalisation, a clear target and trajectory in the roadmap would be useful to make sure the country reaches the EU target by 2030.

With three roadmap measures referring to the digitalisation of public services, Portugal plans to continue mapping the key opportunities and challenges for modernisation of its public administration and enhance its efforts to digitalise key public services. With the National Strategy for the Digital Transformation of Public Administration in force since 2021, the planned transformation is steadily materialising into solutions that are making citizens’ and businesses’ interactions with the state easier.

e-Health



2023 state of play and recent progress

	Country level	EU level
FORECAST		75.5
DESI 2024	86.0	79.1
AVERAGE ANNUAL GROWTH %	37.2	10.6

Average, annual growth is computed between the two most recent available data points

Note: The source of national forecast values is the 2023 country roadmap

Portugal brings a positive contribution to the Digital Decade e-health target while showing a very strong dynamic. In 2023 Portugal scored 86.0 for the overall e-health maturity, above the EU average of 79.1 and significantly higher than last year (62.7 in 2022). The growth of 37.2% (compared to the EU average growth of 10.6%) is one of the highest developments noted for this indicator across the EU. In 2023 54.6% of people in Portugal sought health information online, which is slightly below the EU average (56%).

Portugal has not set a target in e-health for 2030. However, given the recent developments reaching the EU level target at national level seems feasible provided continued efforts. A centralised, nationwide access service to e-health records is available in the country and estimated 80-100% of the population is technically able to access it. The online access service follows the guidelines on web accessibility. Most categories of data are available to citizens on the platform in a timely manner, with the exception of medical images and hospital discharge reports not yet available to citizens. The electronic results and reports are considered to have a high maturity level. Most categories of healthcare providers are supplying data, the only exceptions being private rehabilitation centres and private mental health facilities.

Nevertheless, digitalising the health sector is a priority for Portugal, as evidenced by the Portuguese RRP's EUR 300 million investment dedicated to this target. The set of measures, planned to run until 2026, is based on four pillars: (i) investment in data infrastructures; (ii) simplifying, standardising and digitalising communication channels between individuals and health facilities; (iii) guaranteeing the mobility and usability of health information systems; and (iv) standardisation and generalisation of critical data in the system. As part of these efforts, the **Portuguese population has access to the SNS24 application. With nearly 8 million downloads, the application has been one of the most sought-after services in the country.** More than 390 SNS24 physical counters are in place to help citizens access digital health and telehealth services. Now focusing on the public healthcare system, it is planned to expand data exchange through SNS24 with private healthcare institutions.

Portugal is strongly committed to collaborating on e-health solutions in a cross-border context. In 2023 Portugal actively participated in 13 projects co-financed by the EU. Through the **MyHealth@EU** infrastructure, with active services for patient summary, e-prescription, and e-dispensation, Portugal

has increased the number of pharmacies and hospitals ready for digital cross-border care. For example, at the end of 2023, 82% of public hospitals were digitally prepared for continuity of care across the EU.

As envisaged by the roadmap, other cross-border projects will improve the way healthcare is delivered in Portugal, making it more efficient, accessible, and patient-centred. The Xt-EHR (extended EHR@EU Data Space for Primary Use) joint action will lay the foundations for the technical specifications and guidance needed that could be used for preparing the future implementing acts on the primary use of electronic health data under the upcoming European Health Data Space Regulation. Other projects will support the advancement of interoperability (SNO-PT, EU-HIP), artificial intelligence (TEF-Health), and medical image analysis in oncology settings (EUCAIM).

The key developments of 2023 and measures reported in the roadmap show Portugal's strong commitment to making public services accessible to all. However, it still needs to tackle questions how to encourage the people in Portugal to make full benefit of the solutions in place, how to fine-tune them and to ensure their easiest and most intuitive use.

Building a safe and human centric digital environment and preserving our democracy

According to a 2023 Eurostat survey, **35.5% of the Portuguese population encountered hostile or degrading online messages in the last 3 months**, placing the country slightly above the EU average of 33.5%. Promoting public participation free from hate speech is one of the [Guidelines for a National Plan on Media Literacy](#) adopted by the Portuguese government in November 2023. The Plan will be developed and implemented by an interministerial commission with [a budget line of EUR 300 000 earmarked for 2024](#). Other guidelines include cooperation between stakeholders to promote media literacy, civic participation in literacy initiatives, strengthening public trust in the media and encouraging content accessibility. The actions under the plan should contribute to safe and inclusive participation in the digital public space. The plan will seek to build on the already strong public perception of digital technologies as an enabler to engage in democratic life, as according to the Digital Decade Eurobarometer 73% of Portuguese population (EU average: 74%) believe that by 2030 they will be important in that respect.

Best practice: Generative AI virtual assistant

To further support the population in accessing public services online, in May 2023 the generative AI Virtual Assistant (VA) pilot was launched on ePortugal (the Portuguese single digital gateway). Based on CHATGPT 3.5 turbo, an avatar answers in writing and by voice to queries from the public on e-ID questions. Since its launch, e-ID activations have increased by 10%. While the pilot currently operates in Portuguese, the next phases involve availability in 16 languages and an 'omnichannel' character, i.e., redirection to a human assistant. The aim is to expand the number of services supported by this solution.

Leveraging digital transformation for a smart greening

Portuguese enterprises and people are generally sensitive to the green transition of the digital sector. In 2022, 63.9% of Portuguese enterprises with or more 10 employees considered the environmental impact of ICT solutions and devices when choosing them and applied some measures to reduce paper use or energy consumption of ICT devices. This figure is much higher than the EU average of 48.7%. On the other hand, recycling digital devices follows a similar pattern to other EU countries, with 9.7% of the individuals recycling their mobile phones, 10.4% their desktop computers, and 11.8% their laptops or tablets. According to the Digital Decade Eurobarometer, 82% of people in Portugal consider that ensuring digital technologies serve the green transition should be important for the public authorities. This figure is slightly ahead of the EU average of 81%.

The Portuguese roadmap does not present measures contributing to twinning the green and digital transitions. However, several environmental initiatives launched in 2023 can influence more sustainable digital choices by the national public administration and private stakeholders. For example, the green procurement strategy, **ECO360**, makes provision for: (i) all public administration bodies having a strategy or plan by 2030 for integrating environmental criteria into their procurement strategy; and (ii) half of all contracts for the purchase of goods and services including circularity criteria. This strategy may already influence choices relating to ICT equipment and digital services provided to public authorities.

Through the complementary programme for greening Portugal's supercomputer Deucalion, it will operate solely on renewable energy sources, contributing to the decarbonisation of advanced technologies in Portugal.

Work is also ongoing among several industry stakeholders to reduce the environment footprint of telecoms networks and cloud applications. Some electronic communications operators reported that their network was fully powered by electricity from renewable resources, or they had increased renewable energy use and lowered their greenhouse gas emissions.

Multiple digitalisation measures are directly supporting the green transition. One example is digital invoicing. With the e-invoicing initiative (*Fatura Eletrónica na Administração Pública – FE-AP*) launched in 2019, public authorities receive and process invoices electronically; this reduces paper waste while increasing the efficiency and transparency of the process. Dematerialisation of invoicing is also promoted among enterprises, through a RRP measure under investment entitled 'Catalyst for Digital Transition of Enterprises'.

Portugal uses digital tools to become resource efficient and increase energy literacy. The RePower chapter of the Portuguese RRP involves digitalisation by creating a one-stop-shop for the licensing and monitoring of renewable energy projects. **Barómetro ECO.AP** is a tool that supports the performance and monitoring of the ECO.AP 2030 public administration resource efficiency programme. This digital tool characterises and compares public bodies' consumption of energy, water and materials, energy production and greenhouse gas emissions. The Portuguese Energy Agency (ADENE) has created a set of publicly available digital tools which enable more sustainable choices. An online platform **CINERGIA** – Energy Information Centre, provides educational information on the energy sector to the public. Via ADENE's **casA+** one-stop-shop platform consumers (homeowners or tenants) receive information about their domestic energy and water usage and how

Portugal

to increase its efficiency through renovations. Moreover, the **Poupa Energia** platform enables consumers to compare electricity and natural gas tariffs to make an informed choice or change energy supplier, thus promoting efficiency in energy consumption.

Annex I – National roadmap analysis

Portugal's national Digital Decade strategic roadmap

Portugal submitted its national strategic roadmap on 7 December 2023. The roadmap is based on the National Strategy for the Digital Transformation of Public Administration for 2021-2026. As such, there was no stakeholder consultation on the roadmap. However, stakeholders were involved in the underlying strategy, initiatives and some of the described measures. As the roadmap has not been endorsed at political level, it is not publicly available.

The national strategic roadmap includes **five national target values** for 2030. The target value for at least a basic level of digital skills is in line with the EU target, while the value for ICT specialists in employment is lower than that of the EU (7% versus 10%). Portugal also adopted an additional target of having 30% of women among total ICT specialists in employment by 2030. The roadmap includes intermediate targets for 2025 but does not include national projected trajectories. Portugal used the EU-level targets as its own also for digital intensity of enterprises (90%), joint uptake of AI/cloud/data analytics (75%) and unicorns (a doubling of their number). However, the targets are not accompanied by trajectories.

The below table reflects a best-effort attempt at categorising the measures and budget as presented in Portugal's roadmap.

Digital Decade target	Budget in the roadmap (EUR million)	Number of measures in the roadmap
Connectivity gigabit	-	-
Connectivity 5G	-	-
Semiconductors	-	-
Edge nodes	-	-
Quantum computing	-	-
SME take up	470.0	5
Cloud/AI/Big data uptake	60.0	1
Cloud only uptake	-	-
AI only uptake	-	-
Big data uptake	-	-
Unicorns	-	-
Basic digital skills	0.0	21
ICT specialists	0.0	6
e-ID	24.5	6
Key public services	0.1	3
e-Health	299.9	4
Objectives	-	-
Total	854.5	46

The roadmap submitted by Portugal describes **policies, measures and actions supporting most of the targets. Several measures address Digital Decade objectives such as cybersecurity.** More than half of the roadmap measures supports targets for basic digital skills and ICT specialists, while many support basic digital intensity of SMEs, with some measures supporting the take-up of advanced technologies by enterprises, e-ID and e-health solutions. Measures supporting gigabit connectivity and 5G are absent. The timespan of most measures is projected to run until 2030 or coincides with

the timeframe of structural funds and RRP implementation. This is because most of the budget specified in the roadmap comes from those sources of funding, with prominence given to the RRF. Assessing the scale of measures was not always possible as funding information was frequently lacking.

The roadmap measures seem to **represent a continuation of the existing national digital strategy supporting development of basic and advanced digital skills across demographics and efforts to ensure complementarity of measures available for digitalisation of enterprises.** The measures respond to challenges identified in the roadmap's state of play, addressed under the RRF and covered under the Digital Decade Policy Programme recommendations. New policies, measures and actions relate to technological leadership by creating or updating national strategies and action plans concerning AI, data, Web 3.0 and advanced computing. The measures presented cannot be contextualised without national target values determining Portugal's level of ambition.

Overall, Portugal's roadmap partly reflects the efforts needed in all dimensions of digitalisation. However, some aspects may require more effort. For example, given the ambitious targets at EU and national levels, the measures on digital skills could benefit from a re-focus, especially for ICT specialists, since Portugal needs to roughly double the current number of ICT professionals. Also, the resources dedicated to the digitalisation of enterprises (both basic intensity and adoption of advanced technologies) could be increased given the delay observed in Portugal compared to the EU. Finally, to ensure better coordination at EU level, a comprehensive roadmap outlook remains crucial also for the fields where Portugal performs well, such as connectivity.

Annex II – Factsheet on multi-country projects (MCPs) and funding

MCP and EDICs

Portugal is a member of the already established Local Digital Twins towards the CitiVERSE EDIC (LDT CitiVERSE EDIC) and of the European Blockchain Partnership and European Blockchain Services Infrastructure (EUROPEUM-EDIC). Portugal is also an observer in the already established Alliance for Language Technologies EDIC (ALT EDIC). The country is developing the Statute and other relevant documents of the possible future Cybersecurity Skills Academy and the Genome EDICs, within informal working groups. It is also engaging in discussions on the setup of the possible future Cancer Image Europe (EUCAIM) EDIC, within an informal working group⁸.

Portuguese companies participate in the IPCEI on Microelectronics and Communication Technologies (IPCEI-ME/CT).

As part of EuroHPC JU, Portugal is a partner for 2 supercomputers: MareNostrum 5 in Spain and Deucalion in Portugal.

EU funding for digital policies in Portugal

The Portuguese recovery and resilience plan devotes EUR 4.5 billion (21% of the total) to the digital transformation of which 4.4 billion directly contribute achieving Digital Decade targets, according to a JRC study⁹.

The biggest digital measures of the plan are investment in ‘Digital transition of education’ (EUR 609 million) and ‘Modernisation of supply and vocational education and training institutions— Equipment for digital skills’ (EUR 521 million), followed by the ‘Digital Transition of Enterprises’ (EUR 475 million), ‘Digital Health Transition’ (EUR 300 million) and several measures related to digitalisation of the national administration.

As of March 2024, implementation of the Portuguese RRP is advancing as evidenced by payment requests that successfully led to the disbursement of EUR 7.8 billion.

According to a JRC study¹⁰, Portugal also received EUR 1.7 billion of Digital Decade-relevant budget from cohesion policy funds with the emphasis on enterprises and unicorns.

⁸ Information updated on 31 May 2024.

⁹ Joint Research Centre report ‘Mapping EU level funding instruments to Digital Decade targets - 2024 update’ (Signorelli et al., 2024).

¹⁰ See the reference above.