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ANNEX

ANNEX

to the

**Communication from the Commission to the European Parliament, the Council, the
European Economic and Social Committee and the Committee of the Regions**

Report on the state of the Digital Decade 2023

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Table of Contents

Digital Decade Country Report 2023: Austria	2
Digital Decade Country Report 2023: Belgium.....	4
Digital Decade Country Report 2023: Bulgaria.....	6
Digital Decade Country Report 2023: Cyprus.....	8
Digital Decade Country Report 2023: Croatia	10
Digital Decade Country Report 2023: Czechia.....	12
Digital Decade Country Report 2023: Denmark	14
Digital Decade Country Report 2023: Estonia	16
Digital Decade Country Report 2023: Finland	18
Digital Decade Country Report 2023: France	20
Digital Decade Country Report 2023: Germany	22
Digital Decade Country Report 2023: Greece	24
Digital Decade Country Report 2023: Hungary	26
Digital Decade Country Report 2023: Ireland	28
Digital Decade Country Report 2023: Italy.....	30
Digital Decade Country Report 2023: Latvia	32
Digital Decade Country Report 2023: Lithuania.....	34
Digital Decade Country Report 2023: Luxembourg.....	36
Digital Decade Country Report 2023: Malta	38
Digital Decade Country Report 2023: Netherlands.....	40
Digital Decade Country Report 2023: Poland.....	42
Digital Decade Country Report 2023: Portugal	44
Digital Decade Country Report 2023: Romania.....	46
Digital Decade Country Report 2023: Slovakia.....	48
Digital Decade Country Report 2023: Slovenia	50
Digital Decade Country Report 2023: Spain.....	52
Digital Decade Country Report 2023: Sweden	54

Digital Decade Country Report 2023: Austria

Austria is expected to make a positive contribution to the collective efforts to achieve the EU's Digital Decade targets. Austria performs well on the cardinal points on digital skills, the integration of digital technologies, and digital public services. However, further efforts are needed in digital infrastructures. Austria's vision 'Digital Austria in 2040-2050' is the starting point for Austria's overall digitalisation strategy (Digital Action Plan Austria) which is aligned with the Digital Decade Policy Programme.

Austria is collaborating with other Member States in exploring the possibility to set up a **European Digital Infrastructure Consortium (EDIC)** on establishing the European Cybersecurity Skills Academy.

DIGITAL SKILLS

Even if Austria, with 63% having at least basic digital skills, significantly exceeds the EU average of 54% on this indicator, there is ample room for improvement towards the 2030 target of at least 80% of the population reaching the basic level of digital skills. Upskilling the workforce in terms of digital skills would also contribute to addressing the significant shortage of skilled workers ('*Fachkräftemangel*') that Austria faces. Digital literacy is essential to enable people to participate in modern life and to leave no one behind.

Austria lacks ICT specialists. According to the latest 'Austrian Infrastructure Report', two out of three managers complain about a lack of IT specialists in their company. The available data supports this perception. Even if Austria's share of ICT specialists in the labour force (5%) exceeds the EU average (4.6%), it is low considering the composition of the Austrian economy. The share of female ICT specialists, at 19.3%, is also slightly higher than the EU average of 18.9%.

Austria should accelerate its efforts in the area of digital skills, notably in upskilling and reskilling of its labour force, especially women, and, in particular, in advanced and emerging technologies.

DIGITAL INFRASTRUCTURE

For the Digital Decade targets related to connectivity, Austria shows a varied picture: the country is fast approaching 5G coverage for all populated areas (92% in 2022) but is still far from reaching fixed Gigabit connectivity for all (55% in 2022).

Austria is actively engaged in the areas of microelectronics and quantum computing, thereby contributes to achieving the related targets. Notably, Austria is participating in the Important Project of Common European Interest (IPCEI) on Microelectronics and Communication Technologies), with 6 direct participants focusing on energy efficiency, automotive, and packaging.

Austria should accelerate its efforts on connectivity infrastructure, especially for the fibre to the premises roll-out in rural areas. This requires maintaining the overall level of ambition in Austria's broadband plan while updating the plan to ensure targeted and efficient investment without distorting the market and improving conditions for private investment in rural areas. Moreover, existing obstacles to deployment should be reduced in the context of the 'Internet Infrastructure Austria 2030 Platform' ('Plattform für Infrastrukturausbau' PIA 2030).

Measures taken by Austria in the field of semiconductors and quantum computing should continue in order to help the EU become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

With only two thirds of small and medium-sized enterprises (SMEs) reaching at least a basic level of digital intensity, Austria is still far from the Digital Decade target of 90%. Austria performs slightly below the EU average on this key performance indicator. There is untapped potential in Austria to improve productivity within specific sectors by increasing digital intensity. At the same time Austria

supports SMEs via national and European Digital Innovation Hubs and funding. Austria has shown a mixed picture in the take-up of artificial intelligence (AI), cloud services and big data. The use of big data and cloud services in Austrian enterprises was below the EU average in 2020 and 2021 respectively, although the country’s performance was higher than the EU average on AI in 2021. Austria is actively promoting these new technologies, but this seemingly has yet to result in measurable advances.

Austria should accelerate its efforts in the area of digitalisation of businesses. Attention should be paid to supporting the development and deployment of advanced technologies, including big data, AI and cloud computing, in particular, in SMEs, including through capacity and knowledge building.

DIGITALISATION OF PUBLIC SERVICES

As regards the online availability of digital public services for citizens and business, Austria performs well on national services, in line with the EU average. Austria set up a specific ee-Government strategy and has taken numerous other actions. Overall, Austria is progressing well on providing eID solutions to its citizens. Also, the country is a frontrunner on e-health, scoring significantly higher than the EU average and is well on track to achieving the Digital Decade target related to e-health.

Austria should accelerate its efforts to digitalise public services. In particular, it should monitor the effective use of digital public services as well as possible divides.

Digital in Austria’s Recovery and Resilience Plan (RRP)

More than half of Austria’s Recovery and Resilience Facility (RRF) (52.8% corresponding to EUR 1.8 billion), is devoted to the digital transformation¹. In the context of the first payment disbursed in April 2023, Austria fulfilled more than a dozen milestones and targets for digital measures, including:

- delivery of digital devices for the 5th and 6th grade (first and second year of lower secondary level) of the school year 2021/2022;
- laying the groundwork for the measure ‘KMU.E-Commerce’, which helps SMEs increase their ability to sell goods and services online, and the measure ‘KMU.DIGITAL’, which helps SMEs digitalise;
- preparatory steps for funding research infrastructures and collaborations, with the aim to expand the knowledge base for further developing quantum computing and sciences;
- preparatory steps for the Important Project of Common European Interest (IPCEI) on Microelectronics and Communication Technologies.

¹ Based on Annex VII of the RRF Regulation. Furthermore, a qualitative assessment of the data took place to allow for an estimation of the possible contribution of RRF measures to the Digital Decade targets and the remaining part is also supporting the general objectives of the Digital Decade. This applies to all descriptions of the RRFs included in this Annex.

The information provided refers to the Recovery and Resilience Plan as adopted by the Council before 1 September 2023, without prejudice to potential ongoing revisions of the plan.

Digital Decade Country Report 2023: Belgium

Belgium is expected to make a positive contribution to the collective efforts to achieve the EU's Digital Decade targets. The country has improved its performance particularly in the digitalisation of public services, but is lagging on digital infrastructure, although progress has been made on the roll-out and overall 5G coverage. Belgium performs well when it comes to the digitalisation of businesses, and it is advancing well on the uptake of digital tools by businesses. The different digital strategies in the country, coordinated at federal level through the Digital Decade Working Group, are aligned with the Digital Decade Policy Programme.

Belgium is collaborating with other Member States in exploring the possibility to set up a **European Digital Infrastructure Consortia (EDIC)** on Genome, to enable effective and secure cross-border access to repositories of personal genomic datasets. Belgium is one of the Member States that have jointly submitted a formal application to set up the European Blockchain Partnership and the EDIC on European Blockchain Infrastructure, supporting EU-wide cross-border public services.

DIGITAL SKILLS

Close to half of Belgium's population does not have basic digital skills. The level of basic digital skills in Belgium is at the EU average of 54%, but significantly below the Digital Decade target of 80%.

The share of ICT specialists in the Belgian workforce is 5.6%, which is above the EU average of 4.6%, despite a lower-than-average number of ICT graduates (2.8% versus 4.2%). However, at 18.7%, the share of women among the ICT specialists is slightly below the EU average of 18.9%.

Belgium should accelerate its efforts in the area of digital skills, in particular basic digital skills. Attention should be paid to improving the coordination of digital education policy and strengthening the involvement of relevant stakeholders across the whole country.

DIGITAL INFRASTRUCTURE

Belgium increased the number of households covered by fixed very high capacity networks to 78%, which is above the EU average of 73%. Despite improvements compared to previous years, it still lags significantly behind on fibre to the premises coverage (17% vs. 56%). On overall 5G coverage and the target of achieving a 100% coverage by 2030, Belgium has made some notable progress going from 4% in 2021 to 30% in 2022 coverage of populated areas. However, this is still significantly below the European average of 81%. This is largely due to the late finalisation of the 5G spectrum auction (for the 700MHz and 3.6GHz bands), which also resulted in a new market entrant.

Belgium has also continued to reinforce its leading role within Europe on semiconductors through research and development by funding research in the area with IMEC, a leading research institute on semiconductors. Belgium is contributing to the Important Project of Common European Interest (IPCEI) on Microelectronics and Communication Technologies with associated participants (receiving aid below the General Block Exemption Regulation (GBER) threshold). Belgium is also participating under the Digital Europe Programme to set up the project Belgian-QCI, the first quantum key distribution network in Belgium.

Belgium should step up its efforts on connectivity infrastructure. It should ensure a better coordination to support a more efficient rollout of fibre, notably thanks to a well-functioning Broadband competence office. Belgium should further reduce obstacles to deployment, notably by further simplifying administrative procedures (including permit granting) and measures to grant access to network infrastructure, stimulating reuse of existing infrastructure and co-deployment while reinforcing competition. To ensure that 5G coverage is adequate to market demands, it is essential that Belgium regularly assesses emerging market demand for the remaining unassigned spectrum in the 26GHz band and assigns it when demand emerges. Initiatives like the public-private partnerships to cover white areas are important in this regard.

Measures taken by Belgium in the field of semiconductors and quantum should continue in order to help the EU to become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

Belgium performs particularly well on the digitalisation of businesses. It performs strongly on the number of SMEs with at least basic level of digital intensity (77% vs 69% on EU level). Belgium has performed above the EU average on the uptake of cloud computing, AI and big data and it is in a good position to further contribute to the Digital Decade targets. In particular, Belgium is above the EU average for both big data and cloud, with 23% and 47% of enterprises adopting them already in 2020 and 2021 respectively, as opposed to 14% and 34% as an EU average.

Belgium should continue implementing its policies in the area of digitalisation of businesses, in particular to foster the exploitation of new advanced cloud solutions by businesses and notably by SMEs through more tailored initiatives. Belgium should ensure better coordination of measures within the country to reduce fragmentation and costs for businesses.

DIGITALISATION OF PUBLIC SERVICES

Belgium is progressing relatively well on digital public services. The country continues to improve in digitalising key public services online. Belgium performs above the European average in digital public services for citizens (score 81 vs. 77) and businesses (score 88 vs. 84). On e-health records, Belgium also performs considerably above the EU average (score 85 vs. 72). Large part of the population use at least one of the three available eID schemes, with two of the schemes notified under the eIDAS regulation.

Belgium should accelerate its efforts to digitalise public services. In particular, Belgium should improve the range of data that is accessible to ensure that access to electronic health records with a timely updated minimum set of health-related data, stored in public and private electronic health-record systems is provided. It should further strengthen the collaboration and alignment of the different administrative governments involved, to further improve the interoperability, effectiveness, and availability of online public services.

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

Belgium's RRP allocates EUR 1.6 billion (27%) of its total financial allocation to digital, of which EUR 1.4 billion is expected to contribute to the Digital Decade targets². The plan includes measures focusing on Digital skills, Digital infrastructure and connectivity, cybersecurity, and the Digitalisation of public services. In particular, measures will support the upgrade of ICT infrastructure in schools and/or educational institutions, digital training courses, the 5G roll-out, and the 5G auction. Belgium has not yet submitted a payment request.

² See footnote 1.

Digital Decade Country Report 2023: Bulgaria

Bulgaria has scope to improve its performance in the digital transition and to contribute to the collective efforts to achieve the EU's Digital Decade targets. While Bulgaria continues to perform well in connectivity both on very high-capacity network (VHCN) and fibre to the premises (FTTP), the uneven distribution of digital infrastructure in rural areas requires further attention. Furthermore, the uptake of digital public services is still low and targeted measures are needed, in particular to minimise the administrative burden placed on companies. Significant efforts should be made in the promotion of digital skills.

Bulgaria is collaborating with other Member States in exploring the possibility to set up a **European Digital Infrastructure Consortium (EDIC)** on Genome, to enable effective and secure cross-border access to repositories of personal genomic datasets.

DIGITAL SKILLS

Only around one third of the Bulgaria's population aged between 16 and 74 has at least basic digital skills. Only 8% of Bulgaria's population have above basic digital skills.

Bulgaria is expected to contribute positively to the Digital Decade target on ICT specialists. Although Bulgaria has a low share of ICT specialists (3.8% vs. the EU average of 4.6%), it is the EU country with the highest share of women working as ICT specialists (28.9% vs. the EU average of 18.9%). The share of ICT graduates in the country is 4.9%, above the EU average of 4.2%.

Bulgaria should significantly step up its efforts in the area of digital skills. In particular, Bulgaria should ensure a whole-of-government approach to coordinate more effectively and efficiently the development, implementation, and evaluation of digital education policy and strengthen the involvement of relevant stakeholders. It should step up upskilling and reskilling of the labour force, including by mobilising EU funds or by using the European Technical Support Instrument to develop, deliver and evaluate programmes addressing specific adult learning needs.

DIGITAL INFRASTRUCTURE

Bulgaria has made very good progress in fixed broadband connectivity. Fibre to the premises connections have significantly improved even compared to the last year's performance (from 81% to 86%), which was already higher than the EU average of 56%. However, the uptake of gigabit connectivity remains very low at 0.8%. Mobile 5G roll-out has started to take-up and coverage increased in 2022 to 67%. Regarding the 5G pioneer spectrum bands enabling improved performance, spectrum assignment was completed in December 2022 for the 700MHz and 800MHz bands, which complement the 3.6 GHz and 26 GHz bands licences that were previously issued to mobile network operators. Bulgaria also participates in multi-country projects, notably in the 5G Seamless Roaming for the Greece-Bulgaria Cross-Border Corridor (5G SEAGUL).

Concerning other digital infrastructure, Bulgaria already created an expert working group on semiconductors to exchange good practices and share expertise for the preparation and implementation of public policy in the field of microelectronics. Bulgaria is actively participating in a project for the design of a national plan in quantum communications infrastructure (QCI) in the context of the EuroQCI.

Bulgaria should accelerate its efforts on connectivity infrastructure, in particular by taking measures to incentivise the take up of gigabit connectivity and accelerate 5G rollout.

Measures taken by Bulgaria in the field of semiconductors and quantum computing should continue in order to help the EU become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

The digital transformation of businesses in Bulgaria lags significantly behind other EU countries and therefore the country needs substantial efforts to contribute to reaching the Digital Decade target. The share of enterprises using cloud computing services has been one of the lowest among the EU countries, but the adoption of AI and big data has recently increased. The Programme ‘Competitiveness and Innovation in Enterprises 2021 – 2027’ set strategic goals to provide innovation funding to businesses and support innovation, competitiveness, and the digital and green transition. The programme is structured around three priorities: (i) innovation and growth, (ii) the circular economy, and (iii) digital connectivity. In 2022, Bulgaria implemented strategic measures to support the digitalisation of SMEs with the national Economic Transformation programme.

Bulgaria should significantly step up its efforts in the area of digitalisation of businesses, in particular, it should take further action towards increasing overall digital intensity in SMEs as well as the adoption of cloud computing services, big data and artificial intelligence.

DIGITALISATION OF PUBLIC SERVICES

Bulgaria performs below the EU average for most of targets in the area of digitalisation of public services. The progress on digital public services both for citizens and businesses remains low. The percentage of e-Government users is lower than the EU average. But access to e-health records is above the EU average (77 vs. 72). In January 2023, the upgrade of the Single portal for access to electronic administrative services was completed. The main functionalities of the new portal will ensure that public services are aligned with the European Commission’s interoperability framework. A contract to issue a national eID scheme in compliance with the eIDAS Regulation was concluded and will replace the old scheme. Bulgaria also participates in a cross-border project, funded by the Connecting Europe Facility programme, to establish generic trans-border service for electronic healthcare.

Bulgaria should accelerate its efforts to digitalise public services. In particular, it should raise awareness of its public services being available online to all internet users.

Digital in Bulgaria’s Recovery and Resilience Plan (RRP)

The Bulgarian RRP amounts to EUR 6.27 billion. 25.8% of it (EUR 1.6 billion) is devoted to the digital transformation, of which EUR 1.01 billion is expected to contribute to the Digital Decade targets³. In the context of the first payment request, Bulgaria has achieved 11 milestones and targets. Several of them were related to measures in the digital area, such as reducing spectrum fees, legislative changes implementing recommendations under the Connectivity Toolbox, and awarding contracts to develop the TETRA system and radio relay network. Regarding the second payment request, Bulgaria is expected to achieve 66 milestones and targets out of the 346 in total in the Bulgarian plan.

³ See footnote 1.

Digital Decade Country Report 2023: Cyprus

Cyprus has untapped digital potential to contribute further to the collective efforts to achieve the EU's Digital Decade targets. The country has taken a number of steps towards improving its digital performance and recently established the [Deputy Ministry of Research, Innovation and Digital Policy](#) (DMRID) with a central coordination role for the implementation of the Digital Strategy for Cyprus 2020-2025, which is broadly aligned with the Digital Decade Policy Programme. The progress is not distributed evenly across the different dimensions of the Digital Decade. Cyprus is progressing well in digital skills, but more efforts are needed on the digitalisation of the public sector, in particular for citizens and on connectivity.

Cyprus is collaborating with other Member States in exploring the possibility to set up a **European Digital Infrastructure Consortia (EDIC)** on establishing the European Cybersecurity Skills Academy.

DIGITAL SKILLS

Only 50% of the population in Cyprus have at least basic digital skills, which is 4 percentage points below the EU average. Nonetheless, in 2022, several initiatives to support digital skills development and strengthen the digital fitness and capacity of people were ongoing under the umbrella of the [National Digital Skills Action Plan 2021-2025](#). Cyprus' objective, with the support of the RRF, is to improve digital skills in all population groups including upskilling and reskilling the workforce.

Cyprus shows commitment to contributing to the collective effort to achieve the Digital Decade target on ICT specialists. Indeed, in 2022, Cyprus reached the EU average of ICT specialists in employment (4.6%). Moreover, at 21.6%, the share of women among ICT specialists is higher than the EU average of 18.9%.

Cyprus should accelerate its efforts in the area of digital skills, putting a special focus on training people over 55 and other vulnerable people should contribute to improving the overall level of digital skills of the population. Building on the Year of skills, targeted actions for awareness raising on the training courses available for the population is necessary to meet the Digital Decade objectives and targets.

DIGITAL INFRASTRUCTURE

In the field of connectivity, the plans for a comprehensive roll-out of fixed and mobile networks, together with plans to promote fibre take-up, has started to show first results. The increase in the coverage of fixed very high capacity networks (VHCN) is substantial, with Cyprus reaching 60% in 2022 (from 41% in 2021). This reduced the gap to the EU average to only 13 percentage points. 5G now covers 100% of populated areas in Cyprus significantly above the EU average of 81%. However, the 26 GHz band has not yet been assigned.

In cutting-edge semiconductors, Cyprus is among the Member States that signed the joint declaration on the next generation of processors and semiconductor technologies. However, the country's contribution to the production value in semiconductors is limited. Cyprus is active in the field of quantum computing and participates in the European High-Performance Computing (EuroHPC JU).

Cyprus should accelerate its efforts on connectivity infrastructure, notably on fixed very high capacity networks. Moreover, Cyprus should regularly assess emerging market demand for the remaining unassigned spectrum in the 26GHz band in order to assign it when the demand emerges, under conditions conducive to investment.

Measures taken by Cyprus in the field of digital infrastructures, in particular, in semiconductors and quantum computing, should continue in order to help the EU become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

The share of SMEs in Cyprus with at least a basic level of digital intensity is with 70% above the EU average of 69%. On the use of advanced digital technologies, the situation is mixed. 42% of enterprises used cloud services in 2021. This is 8 percentage points above the EU average of 34%, but still below the EU target of 75% for 2030. Only 6% of enterprises used big-data analysis in 2020, below the EU average of 14%, and only 3% used AI in 2021, again below the EU average of 8%. In 2022, the Ministry of Energy, Commerce and Industry (MECI) launched several funding programmes to facilitate the digital transition of enterprises. Under one of these programmes, the 'Digital Upgrade of Enterprises', a first call for proposals was launched aiming to encourage investments in digital entrepreneurship and strengthen the integration of digital technologies in enterprises. Cyprus and the Research and Innovation Foundation (RIF) also launched the Knowledge Transfer and Innovation Initiative.

Cyprus should accelerate its efforts in the area of digitalisation of businesses. In particular, the swift implementation of the RRP actions and the roll out of several support schemes will contribute to enhance the percentage of enterprises, which could benefit from the adoption of emerging technologies in particular big data and AI.

DIGITALISATION OF PUBLIC SERVICES

Cyprus has been consistent in taking the required measures to improve the provision of digital public services. Digital public services for citizens have progressed but the performance is still 13 points below the EU average score of 77. On digital public services for businesses, however, Cyprus performs one point above the EU average score of 84. In 2022, Cyprus developed the Digital Services Factory (DSF), which is the main strategic initiative to enhance the government's digital transformation. The country also developed an eID scheme that will step up the development and the distribution of eIDs to everyone in Cyprus. Cyprus' score for access to e-health records is 70, only slightly below the EU average of 72. In 2023, the Ministry of Health issued a decree obliging all providers to register health data electronically.

Cyprus should accelerate its efforts to digitalise public services. In particular, it should take measures that further improve the interoperability, effectiveness, and availability of online public services.

Digital in Cyprus' Recovery and Resilience Plan (RRP)

Cyprus' RRP devotes EUR 282.2 million (23%) to the digital transition and from that EUR 261.9 million are expected to contribute to the Digital Decade targets⁴. On 25 October 2022, the European Commission endorsed a positive assessment of Cyprus' first payment request for EUR 85 million (EUR 97 million if prefinancing is included) in grants. Few digital milestones were included in this request: for example, the digitalisation in the central government and the e-skills Action Plan. Further milestones and targets are also expected to contribute to fulfil the Digital Decade targets in the coming years: for example, measures to expand very high-capacity network, create a regulatory sandbox to enable fintech and implement a new cloud policy for government IT systems and services relevant for digitalisation of public services.

⁴ See footnote 1.

Digital Decade Country Report 2023: Croatia

Croatia has untapped digital potential to contribute further to the collective efforts to achieve the EU's Digital Decade targets. The digital transformation of Croatia's economy and society is advancing significantly, with most of its contribution to the achievement of the EU's Digital Decade targets expected to be made in the fields of fibre coverage and in the digitalisation of businesses. More efforts are still needed on digital skills, although there have been improvements. Progress on online public services and the take-up of gigabit services is more limited. Croatia set up new digital initiatives such as the Digital Croatia Strategy towards 2032, the National Development Strategy until 2030 and the National Recovery and Resilience Plan (NPOO), which are aligned with the Digital Decade Policy Programme.

Croatia is collaborating with other Member States in exploring the possibility to set up **European Digital Infrastructure Consortia (EDICs)** on: (i) Genome, to enable the effective and secure cross-border access to repositories of personal genomic datasets; (ii) Innovative Massive Public Administration inter-Connected Transformation Services, to develop a new generation of advanced cross-border services; and (iii) establishing an Alliance for Language Technologies, to develop a common infrastructure in the field of natural language processing and large multi-language models. Croatia is one of the Member States that have jointly submitted a formal application to set up the European Blockchain Partnership and the EDIC on European Blockchain Infrastructure, supporting EU-wide cross-border public services.

DIGITAL SKILLS

Whilst Croatia is progressing on digital skills, with about 63% of people having at least basic digital skills and a performance above the EU average of 54%, more efforts are needed notably on increasing the number of ICT specialists. The share of ICT specialists in total employment is below the EU average (3.7% vs 4.6%). Moreover, the share of women among ICT specialists is, at 14.5%, among the lowest in the EU, and much below the EU average of 18.9%. This situation needs to improve in view of the Digital Decade target.

Croatia should accelerate its efforts in the area of digital skills. In particular, Croatia should increase the capacity of its education system to train more ICT specialists and take action to retain these professionals in the labour market while attracting talent. Croatia should encourage more students to specialise in ICT by implementing specific, time-bound, and measurable actions, paying special attention to increasing the number of cybersecurity professionals.

DIGITAL INFRASTRUCTURE

Since 2018 Croatia has made some progress in deploying fixed-line digital Infrastructures, notably with a significant deployment of its fibre network, from 39% to 54%, in the current reporting period. However, improvement in take-up of broadband services is limited. Croatia's mobile network service take up remains low despite substantial improvement in 5G coverage, from 34% to 82%. Croatia made progress with the licensing at national and regional level of three 5G pioneer bands and the 5G coverage on the 3.4-3.8 GHz spectrum band has reached 37% (EU average - 41%). Regarding other digital infrastructure, Croatia collaborates intensively with other EU Member States in the context of European High Performance Computing Joint Undertaking, the quantum communication infrastructure.

Croatia should accelerate its efforts on connectivity infrastructure, in particular by taking additional action to support demand and take up of gigabit services and further increase its efforts on the roll-out of gigabit connectivity, especially fibre to the premises roll-out in rural areas. The swift implementation of measures financed by the RRF and the ERDF is very important.

Measures taken by Croatia in the field of quantum computing should continue in order to help the EU become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

In 2022, Croatia performed slightly above the EU average in terms of the digitalisation of businesses, including in relation to uptake of advanced technologies, but there is still untapped potential for improving the digital intensity of SMEs. Home to two unicorns, Croatia fosters research and innovation initiatives in digitalisation to contribute to the EU's goal of growing scale-ups and doubling the number of EU unicorns. Croatia is also financing measures supporting Digital Innovation Hubs (DIHs) such as [CROBOHUBplusplus](#) (CROatian Industry and Society Boosting), [AI4HEALTH.Cro](#) (Artificial Intelligence for Smart Healthcare and Medicine), and [JURK EDIH](#) (Digital transformation of Central Croatia and Northern Adriatic).

***Croatia should accelerate its efforts in the area of digitalisation of businesses.** In particular, it should raise awareness about the benefits of business digitalisation, provide public support for workshops and trainings, increase participation in existing (funding) schemes, especially among SMEs. Croatia should intensify its efforts to support the development and deployment of trustworthy, secure, sovereign advanced technologies and solutions, especially for AI, cloud, big data, including through the availability of legal and technical support and procurement procedures.*

DIGITALISATION OF PUBLIC SERVICES

Croatia still lags behind in digital public services, particularly in terms of services for businesses (67 vs. 84 on EU average) and in terms of overall modernisation of its public services with innovative digital solutions. Nonetheless, Croatia performs well in terms of access to electronic health records, with a score of 86 compared to 72 at EU level. By the end of 2022, Croatia implemented the project 'Popularisation of EHR (Electronic Health Records)', thereby enabling the interoperability with the Central Health Information System (CEZIH). Croatia has one electronic identification (eID) card notified under the eIDAS regulation.

***Croatia should step up its efforts to digitalise public services.** In particular, it should take further steps to improve the user-friendliness of online public services, including enhancing support for users. Croatia should step up efforts to increase public procurement investments in the development, testing and deployment of innovative digital solutions and to bridge the gap between local & regional governments and central governments.*

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

The Croatian Recovery and Resilience Plan devotes EUR 1.3 bn to the digital transformation and EUR 841 m is expected to contribute to the Digital Decade targets⁵. In the first payment request, Croatia achieved 34 milestones and targets including on the digital transformation of agriculture and energy renovation process. For the second payment request, Croatia reached 25 milestones and targets, related to a new digital platform for online payment, the adoption of legal acts to accelerate broadband networks, including streamlining the licensing/authorisation process, interoperability of information systems for the provision of online public services. Milestones and targets expected to be fulfilled in 2023 include the digitalisation of public services (one stop shop for e-public helpdesk services and digital identity card deployment project).

⁵ See footnote 1.

Digital Decade Country Report 2023: Czechia

Czechia has untapped digital potential to contribute further to the collective efforts to achieve the EU's Digital Decade targets. Czechia participates in many multi-country projects and has the ambition to become a key player in state-of-the-art technologies such as quantum and microchips. There is also a strong focus on boosting basic and advanced digital skills and Czechs are becoming increasingly skilled and involved in society thanks to new online public services. However, in terms of digitalisation of businesses and connectivity Czechia has been lagging. Czech enterprises are still struggling to hire ICT experts and benefit fully from digitalisation. Limited coverage of fixed very high-capacity networks further impedes progress, especially in rural areas. The Digital Czechia strategy has been undergoing a gradual revision to align it with the Digital Decade Policy Programme.

Czechia is collaborating with other Member States in exploring the possibility to set up **European Digital Infrastructure Consortia (EDICs)** on: (i) Genome, to enable the effective and secure cross-border access to repositories of personal genomic datasets; and (ii) the 'Networked Local Digital Twins Towards CitiVerse' project, using disruptive and immersive technologies for future city related projects.

DIGITAL SKILLS

In Czechia, 60% of the population has basic digital skills, above the EU average of 54%. However, Czechia lacks ICT specialists. ICT specialists in Czechia represent only 4.5% of total employment figures, slightly below the EU average. Moreover, at 10.9%, the share of women among the ICT specialists is the lowest in the EU, compared to the EU average of 18.9%. Enterprises still suffer from the shortage of such specialised workforce. To help speed up the adoption of digital skills and to increase the number of people seeking careers in ICT, the Ministry of Education, Youth and Sports introduced a new programme to support digital education in all Czech schools.

Czechia should continue its efforts in the area of digital skills, in particular accelerate those needed to achieve the ICT specialist target, starting with making the best of the funding mobilised under the RRF, particularly for STEM education and training. Czechia should also pay attention to increase the number of cybersecurity experts. Czechia should also boost the upskilling and reskilling of the labour force, particularly in advanced and emerging technologies.

DIGITAL INFRASTRUCTURE

Overall, Czechia's progress in fixed connectivity has been limited (53% coverage compared to 52% in 2021), and the coverage remains significantly below the EU average of 73%. A large part of Czechia's population does not have access to a fibre connection (63% vs. 44% on average in the EU). On the other hand, when it comes to mobile, Czechia managed to reach a 5G coverage above the EU average. Czechia participates in several pan-European initiatives on key technologies, including the Important Project of Common European Interest (IPCEI) on Microelectronics and Communication Technologies, with 4 direct participants focusing on open-source cores, edge AI and automotive. It also supports research and innovation and is hosting the first European High-Performance Computers under the European High-Performance Computing Joint Undertaking initiative while being part of the European Quantum Communication Infrastructure network.

Czechia should accelerate its efforts on connectivity infrastructure, especially fibre-to-the-premises rollout in rural area. The swift implementation of measures under the RRF and European Regional development Fund is very relevant. Czechia should continue deploying 5G including by completing the overdue assignment of radio spectrum in the 5G pioneer bands. Czechia should regularly assess emerging market demand for the remaining unassigned spectrum in the 26GHz band (to incentivise and facilitate the deployment of 5G services for advanced applications) and assign it when the

demand arises. Measures taken by Czechia in the field of semiconductors and quantum computing should continue in order to help the EU become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

Czechia is still far from the Digital Decade target of at least 75% of enterprises using cloud computing, big data, or AI. In 2022, the proportion of SMEs with at least a basic level of digital intensity was 68% slightly below the EU average of 69%. Except for the use of cloud computing, the value of relevant indicators has been so far also below the EU average. In 2020, only 9% of Czech enterprises used big data technologies (EU 14%), whilst in 2021 40% of enterprises used cloud services and 5% of enterprises used AI technologies. However, there are many public initiatives that are helping the growing number of Czech start-ups. The state agency aims to support up to 250 innovative start-ups with CZK 850 million (EUR 36.2 million) over the next five years. Czechia counts already 4 unicorns.

Czechia should accelerate its efforts in the area of digitalisation of businesses. In particular, it should facilitate access to advanced technologies and strengthen policies and incentives to encourage the digitalisation of businesses, especially SMEs, through sustained and complementary measures, including access to training, raising awareness about the benefits of digital transformation.

DIGITALISATION OF PUBLIC SERVICES

A substantial portion of Czech internet users access public services online (86% versus an EU average of 74%). However, the scores for transparency, mobile friendliness, and user support are below the EU average. The Czech government successfully designed and implemented an electronic identification system that enables citizens to access public services online using their electronic identity cards, without having to visit government offices in person. In 2023, more than 60% of people living in Czechia have at least one of 13 eID means to access e-Government services (an increase of one million compared to 2022). Digital transformation of public services is one of the new government's main priorities and as a result efforts have been made to reach the Digital Decade targets. A new agency was created to help digitalise public services by 2025. Concerning e-health, Czechia scores 47 on access to e-health records, significantly below the EU average of 72.

Czechia should accelerate its efforts to digitalise public services. In particular, it should take further steps towards improving the user-friendliness of online public services, including developing user-friendly interfaces, stepping up support for users abroad and/or users who have difficulties accessing digital public services, creating an easy mechanism for citizens to provide feedback (e.g., user satisfaction survey).

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

The share of Czechia's RRP allocated to digital priorities is 22%, (amounting to EUR 1.56 billion) of which EUR 1.475 billion is expected to contribute to the Digital Decade targets⁶. The main investments focus on boosting digital skills and supporting the digitisation of enterprises. So far, Czechia has rolled out new curricula with more IT classes, invested in new digital equipment for schools, as well as defined interoperability standards for the healthcare systems. Czechia launched a Central European Digital Media Observatory, to identify and investigate disinformation in Central Europe. Milestones and targets that are meant to be met in 2023 include measures to digitalise the justice system and implement a common platform to communicate with the state administration.

⁶ See footnote 1.

Digital Decade Country Report 2023: Denmark

Denmark is expected to make a very strong contribution to the collective efforts to achieve the EU's Digital Decade targets. Denmark is undertaking further efforts to improve access to open data and provide more public digital services for all its citizens and businesses. Denmark has recently created a ministry responsible for digitalisation and the government proposed many new initiatives in the Digital Strategy presented in May 2022.

Denmark is collaborating with other Member States in exploring the possibility to set up a **European Digital Infrastructure Consortium** (EDIC) on Genome, to enable effective and secure cross-border access to repositories of personal genomic datasets.

DIGITAL SKILLS

Denmark ranks well above the EU average when it comes to basic digital skills. 69% of people aged 16-74 have at least basic digital skills (EU: 54%). However, Denmark is still 11 percentage points below the 80% Digital Decade target for 2030.

Moreover, Denmark performs only slightly better than the EU average in terms of the number of ICT specialists in employment (5.7% vs. an EU average of 4.6%), with this percentage only slightly increasing since 2019. At 22%, the share of women among ICT specialists is above the EU average of 18.9%. If Denmark is to help achieve the EU's objective in this area, by 2030 there should be 200 000 additional ICT specialists on top of the approximately 160 000 employed today. Continuing Denmark's successful digital transformation depends on increased availability of ICT specialists on the labour market.

Denmark should continue implementing its policies its efforts in the area of digital skills. Notably, it should focus on upskilling and reskilling of the labour force, in particular, in advanced and emerging technologies as well as increasing the capacity of the educational system to train more ICT specialists.

DIGITAL INFRASTRUCTURE

Denmark remains in a strong position to reach the connectivity targets, with the coverage for very high-capacity networks currently standing at 96% and 98% for 5G coverage in populated areas. However, there is still room for improvement, in particular with regard to the take-up of very high speed broadband by its people and companies. The coverage of remote areas is significantly higher than the EU average, but some people and companies are still not covered by fast connectivity.

Denmark is involved in several initiatives on key technologies. It is participating in the consortium behind the LUMI-Q quantum computing initiative and has been selected as the location for the new NATO centre for quantum technologies. Moreover, Denmark is now using edge computing in a growing number of its municipalities (13% are using it in their operations, 6% have tested the technology, and 16% have considered using it) to collect road traffic data.

Denmark should continue implementing its policies on digital infrastructures. In particular, concerning connectivity, it should explore available sources of financing to shoulder private investment in those areas which are not commercially viable. The Danish authorities are also encouraged to boost investments in developing European-own digital infrastructures in areas such as cloud, quantum and edge computing and encourage EU businesses and public administrations to take up digital tools and solutions, including through joint efforts and multi-country projects.

DIGITALISATION OF BUSINESSES

Denmark is a top performer in the EU for the digitisation of businesses but has potential to improve regarding the targets set for businesses' uptake of more advanced ICT, even though the figures exceed the EU average. In 2021, the use of AI (24%) was three times the EU average. The use of cloud technologies (62% in 2021) and big data (27% in 2020) were almost twice the EU average. Denmark performs very well regarding the basic level of digital intensity: in 2022, 89% of SMEs had reached at least that level, compared to the EU average of 69%. Denmark benefits from a vivid start up ecosystem with 17 potential unicorns worth between EUR 100 million and 1 billion and 8 unicorns. In the start-up area, Digital Hub Denmark has been actively matching potential foreign investors with Danish tech start-ups.

Denmark should continue implementing its policies in the area of the digitalisation of businesses. In particular, Denmark should develop and continue to strengthen the incentives to foster the digitalisation of businesses, notably as regards the uptake of advanced technologies.

DIGITALISATION OF PUBLIC SERVICES

Denmark has consistently focused on developing more effective and reliable digital public services and is on track to reaching the Digital Decade target of 100% availability. There is, in particular, a continued focus on developing better public services, boosted by, among other things, increased use of open data as well as advanced innovative digital technologies (such as AI, big data, robotics, virtual reality, advanced cloud, and high-performance computing).

Denmark scores above the EU average on all indicators. The percentage of e-Government users has increased significantly and stands, as of 2022, at 99%, above the EU average of 74%. Similarly, digital public services scored 84 for citizens and 89 for businesses, both above the EU average. Denmark has developed a well-functioning digital eID, used by a very large part of the population. Access to health data scores at 96, which is close to achieving the Digital Decade target of 100 before 2030.

Denmark should continue implementing its policies to digitalise public services. In particular, it should continue to support the sharing of data in a secure and trusted manner, including by contributing to the common European data spaces and supporting wider deployment of big data solutions.

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

25% of the funds related to the Danish RRP (EUR 380 million) is allocated to the digital transformation and the same amount is expected to contribute to the Digital Decade targets⁷. Denmark submitted to the Commission a request for the disbursement of EUR 301 million under the RRF. The request was based on the country's achievement of the 23 milestones and two targets for the first instalment. The Danish plan supports a range of measures to improve the resilience of the health sector, including those measures to ensure stocks of critical drugs and a sufficient supply of medical products in crisis situations, which have also been implemented. It also supports a broad digital strategy designed to promote a digital transformation of all sectors of society. The milestones and targets relating to the Digital Strategy are covered in future instalments and do not feature in the first payment request.

⁷ See footnote 1.

Digital Decade Country Report 2023: Estonia

Estonia is expected to make a positive contribution to the collective efforts to achieve the EU's Digital Decade targets. Estonia is at the forefront of the digitalisation of public services. However, further efforts are needed to ensure that the country's digital infrastructure will be improved, notably the connectivity infrastructure, which is a critical enabler for all components of the Digital Decade.

Estonia is collaborating with other Member States in exploring the possibility to set up **European Digital Infrastructure Consortia (EDIC)** on: (i) the 'Networked Local Digital Twins Towards CitiVerse' project, using disruptive and immersive technologies for future city-related projects; (ii) Genome to enable the effective and secure cross-border access to repositories of personal genomic datasets; and (iii) Copyright Infrastructure to release the potential of EU's creative sectors.

DIGITAL SKILLS

Estonia is just above the EU average for basic digital skills. In 2021, 56% of individuals aged 16-74 had at least basic digital skills, compared to 54% on average within the EU.

Estonia contributes significantly to the collective efforts to achieve the Digital Decade target on ICT specialists. With 6.6%, Estonia is well above the EU average of 4.6% ICT specialists in total employment. Moreover, at 24.5%, the share of women among ICT specialists is among the highest in the EU, compared to the EU average of 18.9%. This number may further increase over the next few years given the high percentage of ICT graduates in Estonia (10.1% in 2021). The percentage of enterprises providing ICT training is still below the EU average. However, Estonia has made significant progress over the last five years, narrowing the gap between the percentage of enterprises providing ICT training in Estonia and the EU average. This shows that Estonia is on the right path.

Estonia should accelerate its efforts in the area of digital skills. In particular, it should strengthen the action on improving basic digital skills, e.g. by encouraging employers to upskill and reskill employees during working time.

DIGITAL INFRASTRUCTURE

On connectivity, there is a clear need for Estonia to take action in order to contribute to the collective efforts to achieve the Digital Decade connectivity targets. This is mainly due to the low 5G coverage, and the low take-up of fixed broadband of speeds above 100 Mbps. The coverage with fixed very high-capacity network (VHCN) coverage, and with fibre to the premises (FTTP), has continued to grow steadily, reaching 79%, well above the EU averages for both (73% for VHCN and 56% for FTTP). The country continues to invest in building VHCN networks in rural areas, supported by EU funding.

Estonia contributes to the collective efforts in High-Performance Computing mainly through the Estonian Scientific Computing Infrastructure (ETAIS) project. It is also part of the European Quantum Communication Infrastructure initiative to build a pan-European quantum infrastructure, and a partner in the Nordic-Estonian Quantum Computing e-Infrastructure Quest (NordQuEst), making an important contribution to the EU's efforts to reach the Digital Decade targets.

Estonia should accelerate its efforts in the area of digital infrastructure. In particular, it should take measures to foster the development of 5G connectivity and incentivise the take up of gigabit and 5G connectivity. The ongoing activities on quantum computing should be continued with an increased coordination and collaboration to foster a quantum community across the whole EU.

DIGITALISATION OF BUSINESSES

Estonia shows a mixed picture regarding the uptake of digital technologies by enterprises. In 2021, the percentage of enterprises using cloud computing with 51% was significantly above the EU

average of 34%, whereas the percentage of enterprises using AI and big data was below the EU average in 2021 and 2020 respectively. In 2022, the percentage of SMEs with at least a basic level of digital intensity was, with 67%, also slightly below the EU average.

The Estonian business ecosystem includes many innovative and growing start-ups and scale-ups that are driving the country's growth and modernisation. There are currently two unicorns based in Estonia. Two potential unicorns with a current market valuation of between EUR 100 million and 1 billion have been identified.

Estonia should accelerate its efforts in the area of the digitalisation of businesses. In particular, Estonia should increase the uptake of advanced digital technologies by enterprises, and support SMEs in using digital technologies to become more competitive and sustainable.

DIGITALISATION OF PUBLIC SERVICES

Estonia has made particularly significant contributions to the EU's collective efforts to reach the 2030 Digital Decade targets for the digitalisation of public services. Estonia is a global leader in this field and continues to invest heavily in making its digital public services even more user friendly and accessible for citizens and businesses. Estonia has six eID means notified under the Estonian eID scheme. The country can serve as an example for other Member States and has shared its experience and best practices with other countries, as part of the Estonian e-Governance Academy, a foundation-based international development cooperation programme. Further advancements in digital public services remain one of the priorities under Estonia's national Digital Agenda 2030.

Estonia should continue implementing its policies to digitalise public services. In particular, Estonia should continue its investments in innovation procurement of digital solutions to further accelerate the adoption of innovative digital solutions for all public services. It should also address accessibility of health data to enable access for all people (including people with disabilities) and ensure accessibility of all relevant portals from mobile devices.

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

The Estonian RRP devotes EUR 208 million (24%) to the digital transformation. The entire amount is expected to be spent on the efforts to achieve the Digital Decade targets⁸. Substantial digital investments include EUR 93 million to upgrade digital government services drawing on the latest technologies, EUR 58 million to support 230 SMEs in their digital transition and EUR 24 million to deploy very high-capacity networks in rural areas. Estonia's amended RRP was adopted by the Council in June 2023. On 30 June 2023, Estonia submitted a first payment request of EUR 286 million in grants.

⁸ See footnote 1.

Digital Decade Country Report 2023: Finland

Finland has been at the forefront of the digital transformation for many years, expected to make a very strong contribution to the collective efforts to achieve the EU's Digital Decade targets. It has rolled out comprehensive digital policies with early adoption of 5G, has well-developed e-Government services, and has a highly skilled workforce coupled with good coordination and programming. Further measures are needed to reach the gigabit connectivity target. To guide its digital transformation over the coming years, Finland submitted its own Digital Compass in 2022, which is well aligned with the Digital Decade Policy Programme.

Finland is collaborating with other Member States in exploring the possibility to set up **European Digital Infrastructure Consortia (EDICs)** on: (i) Genome, to enable the effective and secure cross-border access to repositories of personal genomic datasets; (ii) Copyright Infrastructure, to release the potential of EU's creative sectors; (iii) Mobility And Logistics Data, to enable access, sharing and reuse of data in these areas; and (iv) Innovative Massive Public Administration inter-Connected Transformation Service, to develop a new generation of advanced cross-border services.

DIGITAL SKILLS

Finland has a population that has a high level of digital skills, making an important contribution to reaching the Digital Decade target. In 2021, the share of the population aged 16-74 with at least basic digital skills (79%) was very close to the EU Digital Decade target of 80% and significantly above the EU average of 54%. The share of ICT specialists in total employment (7.6% in 2022) is very high compared to both the EU Digital Decade target and the EU average in 2022 (4.6%). Moreover, at 23.8%, the share of women among ICT specialists is well above the EU average of 18.9%. In education, the share of ICT graduates is 7.6% and 40% of companies provide ICT training to their staff. Over the last years, the New Literacies Programme 2020-2023 and LUMA centre (an organisation boosting cooperation between schools, universities, and businesses) have stimulated the development of competences in ICT, media literacy and programming, including among children.

Finland should continue implementing its policies in the area of digital skills. Notably, it should implement the announced policies to further increase the number of ICT specialists.

DIGITAL INFRASTRUCTURE

Finland has developed excellent digital infrastructures. The country performs well in overall 5G coverage with 95% of populated areas covered, and in the high-quality 3.4-3.8 GHz band with a coverage of 84%. However, fixed broadband take-up is slightly below the EU average, with 49% of households having fixed broadband at 100 Mbps and only 3.1% of households having fixed broadband at 1 Gbps (significantly below the EU average of 13.8%). Finland's fixed very high-capacity network coverage is 71%, slightly below the EU average of 73%. There is a noticeable divide across the country as the rural areas frequently have white spots, due to the low population density.

Finland is a member of EuroHPC Joint Undertaking that is developing the Lumi, one of the three pre-exascale supercomputers. Finland also is at the forefront of the European quantum computing and semiconductors: IQM Quantum Computers has invested in the building of Europe's first quantum-dedicated semiconductor production facilities in Espoo, and the quantum computer HELMI has been connected to the Lumi; it participates in the Important Project of Common European Interest (IPCEI) on Microelectronics and Communication Technologies, with 3 direct participants focusing on telecommunication and on wafer substrates.

Finland should continue implementing its policies in the area of digital infrastructure. It should pay even more attention to very high-capacity network coverage, delivering broadband to the rural areas, including fibre to the premises throughout the country.

Measures taken by Finland in the field of semiconductors and quantum computing should continue in order to help the EU to become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

Already in 2022, the share of SMEs in Finland that reached at least a basic level of digital intensity was 89.5%, slightly below the Digital Decade target (90%) and far above the EU average of 69%.

Advanced technologies continued to be at the heart of Finnish businesses, with 66% of enterprises using cloud solutions and 16% integrating AI technology into their operations in 2021, and 22% using big data already in 2020.

In 2022, Finland continued to fund programmes supporting businesses, especially SMEs. The country focused particularly on developing a start-up and scaleup ecosystem. Another hallmark of the way Finland integrated digital technologies into the economy was the cooperation between universities, specialised government agencies, and businesses. An excellent example is the 6G Bridge program that develops the next generation of connectivity so that the Finnish industry stays at the start of the value chain for creating the 6G technologies for smart cities, smart energy, smart ports, and smart factories with different players in the ecosystem.

Finland should continue implementing its policies in the area of digitalisation of businesses. In particular, it should continue boosting the take up of advanced digital technologies by businesses, particularly in the area of AI and big data, by providing incentives for investment.

DIGITALISATION OF PUBLIC SERVICES

Finland excels in online interaction between government authorities and the public with 97% of Finnish internet users using e-Government services. The country also performs very well on the number of services provided online. In 2022, the country was progressing well in implementing programmes that started in the previous years. Finland continued upgrading e-Government services putting them under the management of the Digital and Population Data Services Agency. Changes in legislation allowing automatic administrative decisions by means of using AI are underway. In e-health, Finland scores 90, above the EU average of 72, and is on track to meet the Digital Decade target of 100. One of the reasons for this is the My Kanta portal, where people can access their online electronic documents. The country is currently finalizing the implementation of a new digital identity system that will serve also as a certified identification tool in the meaning of eIDAS Regulation. The national open data portal continues to provide data in open formats for companies and the public. Finland has continuously increased its preparedness in cybersecurity stepping up actions with a fresh fund of EUR 230 million for 2022-2026.

Finland should continue implementing its policies to digitalise public services. In particular, cybersecurity should stay at the forefront of governmental policies.

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

The contribution to the digital transformation in Finland's RRP accounts for EUR 525.7 million, 28.9% of the total RRP allocation⁹. The plan allocates: (i) EUR 32 million in high-speed broadband infrastructure; (ii) EUR 85 million for rolling out the new automatic train protection system on the entire national railway network, along with the 4G and 5G-based Future Railway Mobile Communication System; (iii) EUR 100 million to digital innovation in social welfare and healthcare services; (iv) EUR 32 million to invest in digitalising continuous learning; and (v) EUR 25 million to invest in accelerating key technologies (microelectronics, 6G, AI, and quantum computing). Finland has not yet requested a payment from the RRF.

⁹ See footnote 1.

Digital Decade Country Report 2023: France

France has untapped digital potential to contribute further to the collective efforts to achieve the EU's Digital Decade targets. Given the size of the French economy and its population, current and future actions are expected to contribute significantly to such efforts. France has several digital strategies, broadly aligned with the objective of the Digital Decade Policy Programme. France is doing well as regards connectivity and start-ups and shows positive trends in digital public services and human capital. However, the digital transformation of the economy is uneven. In particular, whilst the top innovating companies use and deliver advanced digital technologies, there is not widespread use of basic technologies by small and medium enterprises (SMEs).

France is collaborating with other Member States in exploring the possibility to set up a **European Digital Infrastructure Consortium (EDIC)** on an Alliance for Language Technologies, to develop a common infrastructure in the field of natural language processing and large multi-language models.

DIGITAL SKILLS

Slightly more than three out of five people in France have at least basic digital skills. Nonetheless, scientific, digital and media literacy in all subjects at all levels of formal education needs particular attention. The share of ICT specialists in total employment is stable at 4.3%, slightly below the EU average (4.6%). The share of women among ICT specialists is, at 19%, very close to the EU average of 18.9%. However, despite ambitious positive measures (*Pix, Skills and Jobs of the Future*), France has increased less than the EU average, and the country's prospects are undermined by low rates of ICT enrolment and low numbers of graduates. Significant efforts to improve digital skills are therefore crucial for the EU to reach the Digital Decade target on basic digital skills and ICT specialists.

France should accelerate its efforts in the area of digital skills. In particular, France should implement measures to address all levels of education, especially the fundamental level in mathematics. In addition to boosting the investment for ICT specialists, particularly ICT graduates, France should continue to upskill and reskill the workforce.

DIGITAL INFRASTRUCTURE

France has a strong performance in digital infrastructure. France should already achieve full fibre roll-out in 2025. In 2022, there was particularly good overall coverage for fixed fibre connections, reaching 73% of households, and the rural/urban divide has been narrowing. However, efforts to continue fibre roll-out need to be maintained in France's outermost regions and in rural zones. Thanks to the 'New Deal' plan, mobile coverage in 4G covers all populated areas and 5G roll-out is going well for voice and internet applications, covering 88% of populated areas. New 5G applications are being tested in pilot projects. The environmental aspect of digital sectors has been the focus of several laws.

Cybersecurity is increasingly being addressed but still needs to be stepped up in support of SMEs. A strategy for semiconductors, including public funding, is supporting French and EU industrial sovereignty: it is in line with the EU Chips Act. The country participates in the Important Project of Common European Interest (IPCEI) on Microelectronics and Communication Technologies with 15 direct participants focusing on a wide range of areas including substrates, power, sensing, packaging, automotive, photonics, telecom, aerospace and defence. France aims to become a key player in quantum computing and plans to deploy Euro quantum communication infrastructure. It also participates in the European programme for high-performance computing (EuroHPC).

France should continue implementing its policies on digital infrastructures. In particular France should further improve its 5G spectrum readiness making the remaining priority bands available. France is also encouraged to continue its activities regarding the environmental aspect of digital sectors, as well as in the areas of quantum and semiconductors in order to help the EU become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

Digitalisation of businesses is an area where France needs to contribute more substantially. In 2022, 64% of SMEs used digital technologies, while the EU average was 69%. SME use of digital technologies in France is still far from the Digital Decade objective of 90% and the pace of progression is still insufficient to foster its achievement. Likewise, France businesses have an untapped potential when it comes to uptake of advanced digital technologies, although for several years the France Num initiative has been delivering training and support to SMEs for using digital technologies. Further, France participates in the Next Generation Cloud Infrastructure and Services.

As regards establishing technology start-ups and scale-ups, France has succeeded in nurturing a very favourable ecosystem, considered to be the second best in Europe. 36 companies are considered unicorns in France (a sharp increase from 22 the year before) and 82 companies reached a market valuation of between EUR 100 million and EUR 1 billion. International attractiveness is high for entrepreneurs and they are able to access finance. European Digital Innovation Hubs have been selected, and most are expected to be deployed by early 2023.

France should step up its efforts in the area of digitalisation of businesses. In particular, it should take specific action to improve SME rate of digitalisation, including in advanced technologies.

DIGITALISATION OF PUBLIC SERVICES

Access to public services in France is slightly below the EU average both for citizens and for businesses. However, there are many projects underway to address this. France has put in place an observatory concerning people's digital practices and has started efforts to use cloud more systematically. Electronic identification is in place for several services and the use of the European solution is considered and would need to be accelerated. The Inter-ministerial Direction of Digital (DINUM) provides a platform for open data (data.gouv.fr) and follows concrete actions in 15 ministries. Additional measures are needed to support users who have difficulties to access digital public services, in particular health records.

France should accelerate its efforts to digitalise public services. In particular, it should complement the RRP funding of hardware equipment in hospitals with measures to involve users and adapt the organisation to the new data flows. Public authorities should take measures to further strengthen the alignment of the different administrative levels involved and to improve the interoperability, effectiveness and availability of online public services, in particular in the healthcare sector.

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

The French RRP amounts to EUR 40.3 billion, with 22% of it (i.e., EUR 8.1 billion) allocated to digital transformation, of which EUR 7.7 billion will be spent on efforts to achieve the Digital Decade targets¹⁰. On 19 August 2021, the Commission disbursed the pre-financing of EUR 5.1 billion. In the context of the first payment request, France achieved 38 milestones and targets, leading the Commission to disburse 7.4 billion in Q1 2022. Some milestones were related to measures in the digital area, such as accelerating six key digital technologies (quantum, cybersecurity, education, cultural industries, 5G and cloud) and increasing the resources of France Compétences. The French RRP also includes measures to address the public health sector (EUR 2 billion), training and education (apprentice contracts, training for digital skills, digital learning contents, and a plan for remote learning), digital public services (EUR 500 million), the 'France Très Haut Débit' plan (EUR 240 million) and digital devices for schools.

¹⁰ See footnote 1.

Digital Decade Country Report 2023: Germany

Germany has untapped digital potential to contribute further to the collective efforts to achieve the EU's Digital Decade targets. Given the size of the German economy and its population, current and future initiatives will contribute significantly to such goals. Germany's digital transformation is advancing steadily. However, further efforts are needed to achieve the country's aim of being a front runner. While the coverage of gigabit connectivity, particularly for fibre, is still unsatisfactory, there have been positive developments in the take-up of gigabit connections and 5G coverage. Significant gaps remain in digital public services and skills. The Federal Government's [Digital Strategy](#) sets out the overarching framework until 2025 and is aligned with the Digital Decade Policy Programme.

Germany is collaborating with other Member States in exploring the possibility to set up **European Digital Infrastructure Consortia (EDICs)** on: (i) Mobility And Logistics Data, to enable access, sharing and reuse of data in these areas; and (ii) the 'Networked Local Digital Twins Towards CitiVerse' project, using disruptive and immersive technologies for future city-related projects.

DIGITAL SKILLS

On basic digital skills, Germany has narrowed the gap to the EU average, but with 49% remains below the EU average of 54%. A significant change of pace in Germany's basic digital skills' readiness is crucial for the EU to reach the Digital Decade basic skills target. The initiatives to help develop digital skills continue to be strengthened under the umbrella of the Digital Strategy and include actions related to 'Digital Pact School', the STEM Action Plan 2.0, and the National Skills Strategy. In addition, the digitalisation of education is one of the six priority areas under the German RRP.

The share of ICT specialists in total employment is above the EU average (5.0% vs. 4.6%). At 19%, the share of women among ICT specialists is very close to the EU average of 18.9%. However, future growth prospects in this regard are undermined by high student drop-out rates in ICT subjects. Germany is expected to contribute substantially to the EU's collective efforts to reach the target on ICT specialists.

Germany should accelerate its efforts in the area of digital skills. Germany should develop courses in digital skills across all levels and disciplines in formal and informal learning for the whole population and step up upskilling and reskilling in the field of digital skills in the labour market.

DIGITAL INFRASTRUCTURE

Very serious shortcomings remain in the coverage of fibre-to-the-premises, which stands at 19%, still far from the EU average of 56% and the Digital Decade target of universal coverage of gigabit networks by 2030. The Federal Government supports fibre deployment with considerable funding and an unequivocal commitment to a nationwide roll-out, as set out in its Digital Strategy and Gigabit Strategy.

Germany activities in the areas of quantum and semiconductors are an important contribution to the EU targets. It is very active in developing infrastructure for advanced technologies and participates in several multi-country projects, e.g., the European High Performance Computing Joint Undertaking, the European Quantum Communication Infrastructure and the European Blockchain Services Infrastructure. Germany is leading the Important Project of Common European Interest (IPCEI) on Microelectronics and Communication Technologies with significant investments (in the order of several EUR billion), 32 direct participants covering a broad range of topics from material to packaging, including equipment, automotive, power, photonic, sensing. And significant investments have been made in the area of semiconductors.

Germany should accelerate its efforts on connectivity infrastructure, on gigabit connectivity and especially fibre-to-the-premises. It is important that Germany removes obstacles and boosts investment in very high capacity networks.

Measures taken by Germany in the field of semiconductors and quantum computing should continue in order to help the EU to become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

Regarding the digitalisation of businesses, in 2022, 77% of German SMEs had at least a basic level of digital intensity, significantly above the EU average of 69%. Germany also performed above the EU average in big data analysis and the uptake of AI, although in 2021, the adoption of cloud technology was 32% slightly below the EU average of 34%. Nonetheless, Germany is expected to make a substantial contribution to achieving the Digital Decade targets. This is thanks to continuous support being provided to German SMEs through the ‘SME digital’ (Mittelstand-Digital) initiative, which consists of the Network of Mittelstand-Digital Innovation Hubs, the Digital Now investment grant programme, and the Cybersecurity for SMEs initiative. According to the European Deep Tech Report 2023, Berlin is considered the best EU start-up ecosystem. Moreover, several measures support advanced technologies, including the funding initiative KI4KMU (AI4SME) and the funding programme AI Service Centres. Germany is also participating in the IPCEI on Next Generation Cloud Infrastructure and Services (IPCEI-CIS).

Germany should continue implementing its policies in the area of digitalisation of businesses. A swift implementation of planned measures is needed to further drive the digitalisation of businesses. In particular, it should further strengthen data economy, science and research in key technologies, including in actions to protect the climate.

DIGITALISATION OF PUBLIC SERVICES

Digitalisation of public services has already been a challenge for several years. Although Germany is on track to meeting the Digital Decade targets on the availability of digital public services, major challenges in this area remain unsolved. On digital public services for citizens, the country scores 78 (slightly above the EU average of 77). For businesses it scores 81 (below the EU average of 84). While significant efforts have been made, such as actions to implement the Online Access Act (Onlinezugangsgesetz (OZG)), the country is still lagging behind in this dimension. The main problems include the small number of public services that are digitalised, the lack of nationwide availability of services, and challenges linked to a pilot project on eID application cases.

Germany should accelerate its efforts to digitalise public services. In particular, it should take measures to further strengthen the collaboration and alignment of the different administrative levels to further improve the interoperability, effectiveness and availability of online public services. Moreover, Germany should implement planned measures swiftly and speed up the digitalisation of the entire service chain for public services.

Digital in Germany’s Recovery and Resilience Plan (RRP)

Germany’s RRP focuses on digital investments. From a total budget of EUR 26.4 billion, more than 50% is allocated to digitalisation. Of this, EUR 11 995 million is expected to contribute to the Digital Decade targets¹¹. The plan features two major IPCEIs on digitalisation: Microelectronics and Communication Technologies and the Next Generation Cloud Infrastructure and Services. The first payment request, amounting to EUR 4.5 billion and not yet formally submitted, includes milestones and targets related to the IPCEI on Microelectronics and Communication Technologies, the investment programme for teacher devices and the Online Access Act. After a first plan amendment in February 2023 with very limited relevance for the digital part, Germany is currently working on revising its RRP again to take into account the increased financial allocation (increase of EUR 2.4 billion) and the integration of a REPowerEU chapter

¹¹ See footnote 1.

to decrease the dependence on Russian fossil fuels and to support the green transition.

Digital Decade Country Report 2023: Greece

Greece has scope to improve its performance in the digital transition and to contribute to the collective efforts to achieve the EU's Digital Decade targets. Greece has embraced the digital transformation as a strategic opportunity to build a more competitive and resilient economy and society with its [Digital Transformation Bible](#) for 2020-2025, which is aligned with the Digital Decade Policy Programme. While Greece has made rapid and tangible progress in digitalising public services over the past years, it needs to address significant gaps in the other dimensions, such as the low coverage of very high-capacity networks and the low number of ICT specialists employed.

Greece is collaborating with other Member States in exploring the possibility to set up **European Digital Infrastructure Consortia (EDICs)** on: (i) establishing the European Cybersecurity Skills Academy; (ii) establishing an Alliance for Language Technologies, to develop a common infrastructure in the field of natural language processing and to develop large multi-language models; and (iii) Innovative Massive Public Administration inter-Connected Transformation Services, to develop a new generation of advanced cross-border public services.

DIGITAL SKILLS

More than half of Greece's population have at least basic digital skills (52%), close to the EU average (54%). The percentage of ICT specialists in total employment in Greece is 2.5%, among the lowest in the EU. The share of women among ICT specialists is, at 20.3%, however above the EU average of 18.9%. The current outlook is weakened by several factors, such as the brain drain of digital talent, the lack of specialisation sought after by companies, which should be regularly screened, and the insufficient number of ICT graduates. In this context, Greece is expected to benefit from the recently launched 'Digital transformation executive network', which aims to coordinate more effectively the development, implementation, and evaluation of digital policies. Moreover, Greece is actively committed to contributing to the EU's 2030 digital skills targets and objectives by chairing the informal working group exploring the possibility of submitting a proposal for an EDIC on the European Cybersecurity Skills Academy.

Greece should significantly step up its efforts in the area of digital skills. The need to expand the digital talent pool of ICT specialists in Greece will require special attention to tackle the current gap and ensure the economy benefits from a digitally skilled population. It is also crucial that Greece can forecast the skills required to match the labour market needs and anticipate changes in skills.

DIGITAL INFRASTRUCTURE

Greece still lacks a comprehensive strategy to steer investments and initiatives aligned with the 2030 Digital Decade target of Gigabit connectivity for all. The country is lagging behind the EU average on fixed very high capacity network coverage (28% vs. 73%). The [Greek National Broadband Plan 2021-2027](#), adopted at the end of 2022, aims to put in place 100 Mbps infrastructure, readily upgradeable to 1 Gbps, which falls short of the Digital Decade target for universal Gigabit speeds by 2030. Greece performs much better on mobile connectivity and, as a frontrunner in making the 5G pioneer bands available, reached overall 5G coverage of 86% in 2022 (above the EU average of 81%).

Regarding other digital infrastructures, Greece actively participates in developing multi-country projects, e.g. in the European Quantum Communication Infrastructure (EuroQCI) initiative with HellasQCI. It also participates in the Important Project of Common European Interest (IPCEI) on Microelectronics and Communication with 6 direct participants focusing on design, edge AI, aerospace/defence, and packaging.

Greece should step up its efforts on connectivity infrastructure, in particular Gigabit coverage. Greece should further improve the effectiveness and coordination of initiatives to ensure coherence in achieving its connectivity goals. Greece's efforts in the area of semiconductors and quantum should be sustained in order to help the EU become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

In 2022, Greece took several measures to create favourable conditions for businesses to speed up their digital transformation, but the digital intensity of SMEs and the uptake of advanced digital technologies by Greek businesses needs to step up to contribute to the collective efforts in reaching the Digital Decade targets. The level of digital intensity of SMEs in Greece is 41%, still far from the EU average of 69%. Regarding take-up of advanced digital technologies, enterprises in Greece have been slower at adopting them: in 2020 13% were using big data (EU average: 14%), whilst 15% were using cloud services (EU average: 34%), and only 3% were using AI (EU average: 8%). However, the digital technologies sector is one of the most dynamic sectors of the Greek economy, with growth rates among the highest in the country (6.1% between 2017 - 2021 in compound annual growth rate (CAGR) terms), which could boost Greece's contribution to the Digital Decade.

Greece should significantly step up its efforts in the area of digitalisation of businesses, notably by swiftly implementing the RRP measures and the ERDF Programmes, 'Competitiveness' and 'Digital transformation'. Attention should be paid to supporting the development and deployment of advanced technologies, including big data, AI, in particular in SMEs.

DIGITALISATION OF PUBLIC SERVICES

Greece continues to implement its ambitious strategy to digitalise the public services, making remarkable progress towards achieving the Digital Decade targets. While still performing below the EU average, in 2022 the score for digital public services increased to 65 for citizens (+13 points) and 74 for businesses (+26 points). Moreover, in 2022, the Hellenic Public Administration Certification Authority ([APED](#)) was launched to secure electronic identification, strengthen trust in services and improve authentication procedures in line with the eIDAS Regulation. Greece scores 61 on access to e-health records, significantly below the EU average of 72, as the scope of data accessible is limited and authentication is not handled with an electronic identification (eID) that has been notified or is compliant with the eIDAS Regulation. Nonetheless in 2022, several digital health projects were launched, such as the mobile application [Myhealth](#), which will contribute to the Digital Decade target of 100% of citizens having access to their e-health records.

Greece should step up its efforts to digitalise public services. In particular, it should notify to the Commission an eID scheme under the eIDAS Regulation. The roll-out of the considerable investments earmarked in the RRP for modernising the public administration should continue at the same pace to ensure that citizens and businesses benefit in the immediate future. On e-health records, the scope of data accessible should be expanded and equal access should also be strengthened for disadvantaged groups. Expanding the national telemedicine network should help providing equal access to health services for all residents of the country, regardless their location.

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

The Greek RRP devotes EUR 7.1 billion (23.3%) to the digital transformation, of which EUR 6.8 billion is expected to contribute to the Digital Decade targets¹². The first payment disbursed related to 15 milestones and targets, including an IT tool to monitor the labour market and measures to support private investments in digitalisation. The second payment related to 28 milestones and targets, including the launch of a support scheme for digitalising SMEs. Further milestones and targets include modernising the lifelong learning strategy, upskilling and reskilling people in digital skills, and creating and upgrading infrastructure of research centres across the country.

¹² See footnote 1.

Digital Decade Country Report 2023: Hungary

Hungary has untapped digital potential to contribute further to the collective efforts to achieve the EU's Digital Decade targets. Hungary has progressed with the digital transformation of its economy and society. In 2022, the most significant progress was made in fixed very high-capacity network and 5G coverage. However, to ensure the new capabilities and opportunities offered by improved digital infrastructure are fully utilised, further progress is needed to improve the digital skills of the population. This could also help the further digitisation of the public and private sectors. On 30 November 2022, the Hungarian government adopted the new National Digitalisation Strategy 2022-2030, which is aligned with the Digital Decade Policy Programme.

Hungary is collaborating with other Member States in exploring the possibility to set up a **European Digital Infrastructure Consortium (EDIC)** on an Alliance for Language Technologies, to develop a common infrastructure in the field of natural language processing and large multi-language models.

DIGITAL SKILLS

On digital skills, Hungary scores below the EU average. Only about half of the population aged 16-74 has at least basic digital skills, significantly below the EU 2030 target of 80%. The Hungarian RRP includes several measures that target digital skills, mostly in the form of establishing or improving the tools and facilities needed to develop digital competences. Further strengthening the digital competence of teachers could complement these measures.

The proportion of specialists in ICT in total employment has slightly increased in recent years but in 2022 remained relatively low with 4.1%, below the EU average of 4.6%. The share of women among ICT specialists is, at 13.6%, among the lowest in the EU, compared to an EU average of 18.9%. Implementing the new [National Digitalisation Strategy 2022-2030](#) will be crucial to delivering on the Digital Decade targets of over 80% of individuals having basic digital skills and 20 million ICT specialists in total employment by 2030, although the national strategy might not be sufficiently ambitious.

Hungary should step up its efforts in the area of digital skills. In particular, the digital competence of teachers should be strengthened, together with increased adult participation in digital training courses, to increase the number of people with basic digital skills. Increased cooperation, especially with the private sector, NGOs and social partners, among others, would be relevant in order to develop the skills required within SMEs.

DIGITAL INFRASTRUCTURE

Broadband connectivity is above the EU average, and on 5G, Hungary has made significant progress towards achieving the digital connectivity targets for 2030. In 2022, 5G coverage in Hungary increased to 58%, an increase by 40 percentage points compared to the previous year. However, this is still significantly lower than the EU average of 81%. Fixed very high-capacity network (VHCN) coverage went up from 72% in 2021 to 80% in 2022, surpassing the EU average of 72%. The country has made good progress in the take-up of Gigabit services (29.8%), while 70% of the households subscribe to services higher than 100 Mbps.

Hungary has ambitious plans to deploy a quantum computing module in a future high-performance computing (HPC) system, as well as a 'National Quantum Laboratory'. Several university and research institution teams are working together to develop quantum technologies.

Hungary participates in the development and use of the European Blockchain Services Infrastructure. While the production of semiconductors is limited to back-end activities, there are development activities in the design of new circuits. Hungary is contributing to the Important Project of Common European Interest (IPCEI) on Microelectronics and Communication Technologies ecosystem with associated participants (aid below the GBER threshold).

Hungary should step up its efforts on connectivity infrastructure, in particular in 5G roll-out. The implementation of the National Digitalisation Strategy, which sets out the path for reaching the targets, would help achieve these goals.

Hungary's efforts in the area of semiconductors and quantum should be sustained in order to help the EU to become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

The digitalisation of businesses remains a major challenge in Hungary. Most businesses, in particular SMEs, are not yet maximising the opportunities offered by digital technologies. This has a negative impact on the competitiveness of the economy. In 2022, only 52% of SMEs in Hungary had at least a basic digital intensity (significantly below the EU average of 69%). The use of advanced digital technologies, such as big data and artificial intelligence, was less than half of the EU average in 2021 (3% in Hungary against 8% in the EU). In 2021, the use of cloud computing services was 21% 13 percentage points lower than the EU average (34%). Hungary participates in the IPCEI on the Next Generation Cloud Infrastructure and Services.

Hungary should significantly step up its efforts in the area of digitalisation of businesses. Further incentives for investments, as well as measures to ensure supportive framework conditions for the digital transformation of SMEs, in particular in the area of skills, are necessary to speed up the digital transformation of businesses, to increase SMEs' use of digital technology, and to develop digital start-ups.

DIGITALISATION OF PUBLIC SERVICES

Hungary continues to make progress in digitalising public services, but it still performs below the EU average in this respect. Hungary's performance for providing digital public services to both businesses (76) and citizens (68) are below the EU average and the 2030 EU target of 100. Hungary still faces the challenge of accelerating the adoption of several advanced digital solutions into its public sector, among others especially the innovation procurement of transformative digital technologies. For electronic identification (eID), cross-border e-identification is expected to become available in 2023 via the eIDAS scheme. The use of national eID cards remains limited, as most users prefer the "client gate trusted profile". The Hungarian RRP includes several measures that focus on digitalisation in healthcare where Hungary scores 80, above the EU average.

The Digital Renewal Operational Programme (DROP), supported by Cohesion Policy, sets strategic goals related to open data and the use of cloud technology in the public administration.

Hungary should accelerate its efforts to digitalise public services.

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

With 30% of its allocation devoted to digital measures (EUR 1.7 billion), of which EUR 1.2 billion is contributing to the Digital Decade targets¹³, the plan includes a comprehensive package to promote the digital transformation of the economy and society. Most components contain measures on digital transition. Significant measures are planned to improve the digital equipment and skills in primary, vocational and higher education. The plan contains measures related to the digitalisation of public administration and of the health, transport and energy sectors.

¹³ See footnote 1.

Digital Decade Country Report 2023: Ireland

Ireland is expected to make a positive contribution to the collective efforts to achieve EU's Digital Decade targets. The country demonstrates continuous commitment to a human-centric and green digital transformation. Indicators show a high level of digital skills. The country also has the potential to further improve its performance on digital infrastructure and digitalisation of businesses. The implementation of the overarching National Digital Strategy, published in February 2022 and fully aligned with the Digital Decade Policy Programme, should help to achieve this goal.

Ireland is collaborating with other Member States in exploring the possibility to set up a **European Digital Infrastructure Consortium (EDIC)** on establishing an Alliance for Language Technologies, to develop a common infrastructure in the field of natural language processing, and to develop large multi-language models.

DIGITAL SKILLS

Ireland's continuing efforts regarding digital skills, both basic and high-level, have been successful. 70% of adults in Ireland have at least basic digital skills, both well above the EU average (54%) and not far from the EU 2030 target (at least 80%). Ireland continues to implement the [10-year Adult literacy for life strategy](#) (September 2021) and the [Digital strategy for schools to 2027](#) (April 2022), with EUR 200 million worth of funding committed in the national development plan. Ireland is developing an action plan on digital skills, due to be finalised in 2023, as well as an approach for a more unified tertiary education system. In addition, Ireland is making efforts to ensure an appropriate foresight regarding digital skills, including high-level ICT skills.

In Ireland, the share of ICT specialists in total employment is 6.2%, above the EU average of 4.6%. The proportion of graduates who study ICT programmes is 8%, almost double the EU average of 4.2%. However, female ICT specialists, while above the EU average, represent only a fifth of all ICT specialists.

Ireland should continue implementing its policies in the area of digital skills, to further boost the development of basic and high-level digital skills, while giving specific attention to ensuring gender balance.

DIGITAL INFRASTRUCTURE

Fixed very high-capacity network (VHCN) coverage in Ireland has grown steadily over the past three years, from 67% in 2020 to 84% in 2022, making good progress towards the EU 2030 target of 100%. However, the country is lagging behind regarding the take-up of at least 100 Mbps and at least 1 Gbps broadband. On the overall 5G coverage, at 84% it is above the EU average of 81% and is making good progress towards achieving the EU 2030 target of 100% coverage. At 56%, Ireland performs better than the EU average concerning 5G coverage on the 3.4-3.8 GHz spectrum band. In December 2022, a new [Digital connectivity strategy](#) was published. Ireland is progressing well with the implementation of the [National broadband plan](#) (NBP) and the connection of primary schools to broadband networks. In 2023, Ireland partially completed the transposition of the European Electronic Communications Code.

Ireland participates in the Important Project of Common European Interest (IPCEI) on Microelectronics and Communication Technologies with 1 direct participant active in manufacturing. Ireland is also home to over 100 semiconductor companies exporting EUR 13.5 billion worth of products annually. The country supports initiatives in the field via the EUR 500M [Disruptive Technologies Innovation fund](#). Ireland shall purchase 18 edge nodes by end 2023 through the RRF.

Ireland should accelerate its efforts on connectivity infrastructure. In particular, Ireland should (i) increase its efforts to enable 5G connectivity, in particular 5G coverage in the 3.4-3.8 GHz spectrum band, (ii) undertake a timely public consultation regarding the 26 GHz frequency band, and (iii)

further enable gigabit connectivity, in particular regarding the take-up of at least 100 Mbps and at least 1 Gbps broadband.

Measures taken by Ireland in the field of semiconductors and edge nodes should continue in order to help the EU to become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

Ireland's efforts in digitalising businesses have already born fruit, as, in 2022, 85% of SMEs demonstrate at least a basic level of digital intensity. This performance is significantly higher than the EU average of 69% and is also very close to the 2030 EU target of more than 90%. The uptake of digital technologies by enterprises in Ireland was so far average and falling significantly short of the Digital Decade target (big data (23% in 2020), cloud (47% in 2021), and particularly AI (8% in 2021)). Nonetheless, Ireland is taking substantial action to further advance the adoption of digital technologies across all enterprises throughout the country, e.g. by establishing an [Enterprise digital advisory forum](#), appointing its first AI ambassador to lead a 'national conversation' on the role of AI in people's lives, and launching a EUR 85 million [Digital transition fund](#) to support companies in their digital transition.

Ireland should continue implementing its policies in the area of digitalisation of businesses, in particular to advance the adoption of big data, cloud and particularly AI across the entire business base of the country.

DIGITALISATION OF PUBLIC SERVICES

The public services provided to business and the general public in Ireland are highly digitalised, with respective scores of 100 and 81. However, Ireland does not yet provide citizen access to electronic health records. This hinders progress towards achieving the EU's Digital Decade target of 100% of EU citizens having access to their electronic health records. Ireland is committed to further advancing digitalisation in public services. It is currently implementing the [Connecting government 2030: Digital and ICT public service strategy](#) (March 2022), including the development of an online key life events portal. A digital inclusion roadmap will be published in 2023 and will set out measures to better support those who may not be able to access services online. In terms of digital identity service to access digital public services, there are over 1.88 million verified [MyGovID](#) accounts. This represents approximately 49% of the adult population, with a very significant increase in uptake over the past two years. The development of a new digital healthcare framework 2023-2027 is ongoing.

Ireland should continue implementing its policies to digitalise public services. In particular, it should ensure everyone can access the electronic health records.

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

The Irish Recovery and Resilience Plan devotes EUR 312 million (32%) to the digital transformation, all of which is expected to be spent in helping achieve the Digital Decade targets¹⁴. In the context of the first payment request, Ireland is expected to, among other things: (i) sign the contract for the building of the shared government data centre facility; (ii) launch calls for proposals under the project on the digital transformation of Irish businesses; (iii) install connection routers in at least 750 primary schools; (iv) set the criteria to fund ICT infrastructure in schools; (v) award the contracts for the procurement of an ePharmacy system; and (vi) equip disadvantaged students at further and higher education institutions with ICT devices (e.g. provide at least 20 000 laptops), etc.

¹⁴ See footnote 1.

Digital Decade Country Report 2023: Italy

Italy has untapped digital potential to contribute further to the collective efforts to achieve the EU's Digital Decade targets. Given the size of the Italian economy and its population, current and future efforts will contribute significantly. In recent years, Italy has made significant advances in terms of infrastructure, but performs below the EU average on skills and some aspects of the digitalisation of public services. The strategies adopted on cloud, blockchain, AI, and recently on cybersecurity, together with the reforms and investments under the Recovery and Resilience Plan, create a solid framework for achieving a sustainable and inclusive digital transformation.

Italy is collaborating with other Member States in exploring the possibility to set up a **European Digital Infrastructure Consortium (EDIC)** on establishing the European Cybersecurity Skills Academy. Italy is one of the Member States that have jointly submitted a formal application to set up the European Blockchain Partnership and the EDIC on European Blockchain Infrastructure, supporting EU-wide cross-border public services.

DIGITAL SKILLS

Italy's progress in digital skills remains slow, contributing only modestly to the Digital Decade target. Only 46% of the population have basic digital skills. This undermines their capacity to benefit from digital opportunities and to exercise their digital citizenship and has a negative impact on Italy's inclusiveness. Italy adopted a specific national strategy and included reforms and investments in the Resilience and Recovery Plan (PRR) which are intended to increase the level of digital skills. While the importance of developing new skills and updating job profiles is recognised as a priority, the number of enterprises actually offering training to their employees is still insufficient.

Italy's number of ICT graduates remains significantly below the ambitions for the EU's Digital Decade, as the country is unable to meet the business demand for qualified professionals. Even though the offer to provide training is evolving and has been expanded by new flexible training offers focusing on STEM, the share of ICT graduates remains at 1.5%, which is insufficient and significantly below the EU average of 4.2%. Moreover, the share of women among ICT specialists is 16%, well below the EU average of 18.9%.

Italy should step up its efforts on digital skills, in particular in upskilling and reskilling of its labour force. Moreover, it should introduce skills forecasting to match the needs of its labour market and improve cooperation particularly with industry and civil society. Italy should increase the capacity of the educational systems to train more ICT specialists, leveraging the RRF funding.

DIGITAL INFRASTRUCTURE

Italy has made some remarkable progresses towards achieving the Digital Decade targets on digital infrastructures and its RRP represents a significant boost for important investment. Concerning the Digital Decade target for fixed very high-capacity network (VHCN), Italy still remains below the EU average (54% of households against 73% in the EU), despite a 10 percentage points jump between 2021 and 2022. Italy achieved nationwide 5G coverage in 2021 and 93% of harmonised spectrum was assigned as of 2023. Also, 5G coverage provided on the 3.4-3.8 GHz spectrum band to 80% of households.

Italy continues to strengthen its position in the semiconductors technologies and cloud computing sectors. Investments under the RRP include support for participation in the Important Project of Common European Interest (IPCEI) 'Microelectronics and Communication Technologies' with 10 direct participants active in a wide range of applications. Italy is at the forefront of High-Performance Computing (HPC) and quantum computing. LEONARDO, a world-class supercomputing system developed and assembled in Europe, is currently the fourth most powerful supercomputer in the world. LEONARDO will be further improved to become one of the first European-built quantum computers. In March 2023, Italy launched TeRABIT, an infrastructure based on last-generation

dedicated fibre optics, allowing data to be exchanged at terabit speeds (1 000 billion bits per second). Several operators are starting to deploy a more decentralized edge cloud infrastructure, in particular to overcome potential congestion issues and optimize video service.

Italy should step up its efforts on connectivity infrastructure, in particular Gigabit coverage. It will be crucial for Italy to maximise the available to improve fixed connectivity coverage and consolidate the significant achievements made in mobile connectivity, particularly for advanced applications.

Measures taken by Italy in the field of semiconductors, edge nodes and quantum computing should continue in order to help the EU to become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

Most Italian SMEs have at least a basic level of digital intensity in line to EU average (70% compared to the EU average of 69% in 2022). Progress has been especially strong in the use of electronic invoices, outperforming the EU’s average with 95% (in 2020), as well as the percentage of SME turnover from ecommerce reaching 14% (in 2022). However, more could be done in relation to update of advanced digital technologies: whilst, in 2021, cloud was used by 52% of enterprises, well above the EU average of 34%, the picture is different for big data and AI, where, in 2020, only 9% of enterprises used big data, and, in 2021, 6% used AI. Italy is actively participating in the European Digital Innovation Hub (EDIH) network with 13 EDIHs, which were selected to be co-funded by EU’s Digital Europe Program and Italian Government. Despite these measures the possibility for start-ups to scale up in Italy remains limited when compared to other Member States. Furthermore, Italy is participating in the IPCEI on Next Generation Cloud Infrastructure and Services.

Italy should continue implementing its policies in the area od digitalisation of businesses. In particular, Italy should continue supporting the development and deployment of advanced technologies, notably AI and big data, including capacity and knowledge building. Italy should strengthen its efforts to encourage entrepreneurship in digital sectors and create an ecosystem of innovation, in particular for start-ups and SMEs, improving their chances to scale up.

DIGITALISATION OF PUBLIC SERVICES

Italy scores below the EU average on providing digital public services for citizens (score of 68 vs. 77) and businesses (score of 75 vs. 84). Despite the delays accumulated over recent years, increased efforts has been made in relation to: (i) availability, efficiency and security of digital infrastructure, (ii) the interoperability of data and information across public administrations, (iii) the implementation of the once-only principle, (iv) incrementing the use of the digital identity and (v) the completion of the system for electronic health records. Recent measures taken to ensure more user-centric public services and to improve the accessibility of digital public services are likely to further encourage the public to use digital public services by citizens.

Italy should step up its efforts to digitalise public services. In particular, it should speed up the implementation of existing and planned measures.

<p>Digital in Italy’s Recovery and Resilience Plan (RRP)</p> <p>The Italian Recovery and Resilience Plan devote EUR 48 billion (25%) to the digital transformation and out of which EUR 42 billion is expected to contribute to the Digital Decade targets¹⁵. Italy has already achieved several digital measures, such as: (i) the reform ‘Cloud First and Interoperability’; (ii) the reform of ICT procurement; (iii) streamlining and accelerating ICT procurement; (iv) calls for expression of interest to select projects under the ‘Important Projects of Common European Interest’; (v) the adoption of a National Plan for New Skills; and (vi) five connectivity measures.</p>

¹⁵ See footnote 1.

Digital Decade Country Report 2023: Latvia

Latvia has untapped digital potential to contribute further to the collective efforts to achieve the EU's Digital Decade targets. While performing very well on fixed connectivity and on digital public services, Latvia has made limited progress on 5G and on the take up of gigabit services, and is underperforming on the digitalisation of business. Therefore, sustained efforts are key to unlock the potential for the economy. Latvia still needs to increase the level of digital skills among its population. Aligned with the Digital Decade Policy Programme, and coordinated between national and local authorities, academia, and NGOs, the Implementation plan 2023-2027 has updated Latvia's national digital strategy.

Latvia is collaborating with the other Member States in exploring the possibility to set up **European Digital Infrastructure Consortia (EDICs)** on: (i) establishing an Alliance for Language Technologies, to develop a common infrastructure in the field of natural language processing and large multi-language models; and (ii) 'Copyright Infrastructure', to release the potential of EU's creative sectors.

DIGITAL SKILLS

Latvia is still slightly below the EU average on at least basic digital skills (51% vs. 54%), and significantly below the Digital Decade target of 80% for 2030.

It is also below the target of ICT specialists where Latvia stands at 4.4%, below the EU average of 4.6%. In addition, only 15% of enterprises are providing ICT training to their employees, compared to an EU average of 22%. However, Latvia is above the EU average on ICT graduates (5% vs. 4.2%), Internet use (90% vs. 89%) and gender convergence of its ICT specialists (22.8% vs. 18.9%).

Latvia should accelerate its efforts in the area of digital skills. In particular Latvia is encouraged to continue implementing measures to address all cycles of education and to mainstream digital in the education system, integrated to all subjects. Special attention should be paid to attracting and retaining ICT specialists.

DIGITAL INFRASTRUCTURE

Most Latvian households have access to gigabit networks. Latvia is well above the EU average on coverage of fixed very high-capacity networks (92% vs. 73%) and on Fibre-to-the-Premises (91% vs. 56%), being well placed to reach the Digital Decade target of 100% gigabit connectivity target.

As of mid-2022, 5G coverage in Latvia reached 42% of populated areas in Latvia, far below the EU average of 81%. Latvia is doubling its efforts to reduce red tape and make available dedicated spectrum for boosting the 5G coverage. Latvia is drawing EUR 12.5 million from the RRF and EUR 4.35 million from the European Regional Development Fund and private co-financing to make optical networks available on the Via Baltica highway by the end of 2025. Moreover, Latvia is becoming a frontrunner in the development of industrial and innovative applications of 5G technologies.

A national level experimental and advanced quantum communication infrastructure (QCI), funded by the Digital Europe Programme, is being developed to test specific national QCI initiatives, using part of the resources devoted to use cases in the defence sector, and another part publicly available for testing commercial services in healthcare, finance and 5G. A memorandum of understanding was signed in November 2022 between 12 partners to develop semiconductors capabilities in Latvia through the entire value chain. Latvia is contributing to the Important Project of Common European Interest (IPCEI) on Microelectronics and Communication Technologies ecosystem with associated participants (receiving aid below the GBER threshold).

Latvia should accelerate its efforts on connectivity infrastructure. In particular, Latvia should increase efforts in rolling out 5G connectivity. The swift implementation of the RRF measures is very relevant. Moreover, Latvia's efforts in the area of quantum and semiconductors should be sustained in order to help the EU become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

Latvia has made some progress on several indicators concerning the digitalisation of business but is still below the EU average overall. With 52% of SMEs with at least a basic level of digital intensity, Latvia is far below the EU average of 69% in 2022. Latvia's share of enterprises using cloud services (22% in 2021) has been low compared with the EU average (34%). Only 4% of enterprises used AI in 2021 below the EU average (8%). Developing a sustainable digital economy is one of the main priorities of policy making in Latvia. The Latvian RRP promotes digital transformation of businesses with total support estimated at EUR 138 million. Several measures are planned such as the digitalisation of business processes, financial instruments for promoting the digital transformation of economic operators and two European Digital Innovation Hubs, with more than 10 regional contact points in the country's largest cities of Latvia established as one-stop-shops. As part of its smart specialisation strategy, Latvia is working to develop a fully-fledged innovation system management model, including via a steering group dedicated to ICT. Latvia is partner in the IPCEI on the Next Generation Cloud Infrastructure and Services.

Latvia should significantly step up its efforts in the area of digitalisation of businesses. In particular, Latvia should strengthen the dissemination and exploitation efforts of digital technologies and the implementation of strategies jointly developed by both public and private actors, to strongly boost the use of new advanced cloud solutions among SME ecosystems.

DIGITALISATION OF PUBLIC SERVICES

Latvia performs well on the availability of digital public services, scoring 87 on digital public services for citizens (EU average: 77) and 86 for businesses (EU average: 84). Compared to the EU average of 72, Latvia scores above, at 79, for the online access to electronic medical records. In the field of electronic identification (eID), Latvia has notified a scheme to the Commission under the eIDAS Regulation. It is one of the pioneer Member States to have developed a mobile eID solution introducing the app 'eParaksts mobile' that allows users to sign documents electronically, enter into contracts and receive services from authorities. Latvia has been part of several collaborative projects on eID, including the 'Nordic-Baltic eID Project' (NOBID) which aims to harmonise various eID solutions in eight Nordic and Baltic countries to ensure cross-border access to digital services in the region. Latvia's 'Digital Health Strategy until 2029' is being finalised and will ensure the strategic development and management of digital health by building an open and interoperable health data ecosystem. Among other advancements in 2022, the national electronic health record system allowed Latvian citizens to indicate on their electronic health records their preferences regarding organ donation or authorisations to other people to make decisions concerning medical treatment.

Latvia should accelerate its efforts to digitalise public services. In particular, it should continue to ensure that electronic health records are easily accessible and continue to boost digital public services for citizens and digital public services for businesses.

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

The Latvian RRP devotes EUR 1.8 billion (21%) to the digital transformation, almost entirely expected to contribute to the Digital Decade targets¹⁶. The Plan's main objectives are to tackle the digital skills gap and boost digital transformation and innovation of businesses while maintaining the country's strong position on digital public services. Investments in 5G backhaul and last-mile connectivity are also envisaged.

¹⁶ See footnote 1.

Digital Decade Country Report 2023: Lithuania

Lithuania is expected to make a positive contribution to the collective efforts to achieve the EU's Digital Decade targets. It benefits from continuity in the implementation of plans and strategies, which are aligned with the Digital Decade Policy Programme. Significant progress has been made in digital skills, but further effort is needed to contribute to the achievement of the Digital Decade targets, and connectivity, whilst the performance on digitalisation of public services has been consistently good.

Lithuania is collaborating with other Member States in exploring the possibility to set up **European Digital Infrastructure Consortia (EDICs)** on: (i) establishing a Alliance for Language Technologies, to develop a common infrastructure in the field of natural language processing and large multi-language models; and (ii) Innovative Massive Public Administration inter-Connected Transformation Services, to develop a new generation of advanced cross-border public services.

DIGITAL SKILLS

More than half of Lithuania's population aged 16-74 does not have at least basic digital skills. There was significant progress made in increasing the share of ICT specialists in total employment (4.4% as compared to 3.8% the year before, and to the EU average of 4.6%). Moreover, there is more gender balance among ICT professionals in Lithuania than the EU average (22.9% vs. 18.9%). The national policies mainstream the digital skills in the schools' curricula and university programmes. There are also a few projects receiving supports from the EU funds ongoing in this area, including the [EdTech project](#), scheduled for 2022-2024 with a budget of EUR 30 million.

Lithuania should accelerate its efforts in the area of digital skills. In particular, Lithuania still needs to invest substantial funds in formal education and training and carry out upskilling and reskilling efforts for people already active in the labour market.

DIGITAL INFRASTRUCTURES

A positive outlook is noticeable both in fixed and mobile connectivity. The roll-out of fixed very high-capacity networks (VHCN) has increased covering 78% of households, which is above the EU average of 73%. The roll-out of Fibre-to-the-Premises (FTTP) kept on increasing and is well above the EU average (78% vs. 56 %). On the other hand, the take-up of 1 Gbps connections is very low (1.7% of households vs. an EU average of 13.8%). In 2022, there was a significant increase in the populated areas with 5G coverage from 33% in 2021 to 90%, above the EU average of 81%. The most important development in 2022 consisted of two auctions of the 5G dedicated spectrum bands, which have been successfully concluded. The associated coverage obligations are expected to allow for further progress towards the EU target of ensuring 5G coverage in all populated areas. To maximise this effect, further measures have been put in place to stimulate both VHCN and 5G roll-out to contribute achieving the 2030 connectivity targets.

Lithuania should accelerate its efforts on connectivity infrastructure. In particular Lithuania should increase its efforts in rolling out gigabit connectivity, especially fibre to the premises in rural areas, with the assistance of EU funds. Lithuania should take measures to incentivise take-up of high-speed connectivity.

DIGITALISATION OF BUSINESSES

Lithuania performs close to the EU average on the digitalisation of businesses, with indicators on sales of online commerce remaining above the EU average. However, the proportion of SMEs with at least basic digital intensity stands at 64%, below the EU average of 69%. In particular, in 2021, the adoption of advanced technologies such as cloud solutions was 28% against the EU average of 34%. The adoption of AI stood at 5%, against the EU average 8%. Lithuania has several support measures for SMEs in place, providing funding (*E-komercijos modelis*) and improving legal environment for digital start-ups.

Lithuania should accelerate its efforts in the area of digitalisation of businesses. It is important that Lithuania matches its investments with strategic reforms and balances the investments made in the public and private sectors, with a special focus on SMEs.

DIGITALISATION OF PUBLIC SERVICES

Lithuania kept on improving its digital public services for citizens (score of 84) and businesses (score of 94), performing much better than the EU averages. Lithuania has already in place the personal ID card for both electronic identification and electronic signature. The Lithuanian government uses an 'e-citizen service' to make it easier for people to contact government agencies via electronic means, as well as to monitor the progress of petitions, applications, or public consultations. On legislation, the e-Seimas service enables people to register public legislative initiatives and also comment on the legislative acts being processed by the Parliament. Lithuania performs strongly in providing online medical records, with a score of 92, largely above the EU average. The Electronic Information System of Health Services & Cooperation Infrastructure (ESPBI IS) currently hosts almost 100% of Lithuanian healthcare providers, as well as pharmacies. All national healthcare bodies in Lithuania are required to use the system when providing health-related services. Lithuania is currently rolling out the new RRF-funded e-Government project 'Data Lake', linking state registers and allowing easy access for state agencies.

Lithuania should continue implementing its policies to digitalise public services.

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

Lithuania's RRP devoted EUR 701 million (31.5%) to measures supporting digital transition. Of this amount, over EUR 660.5 million is expected to contribute to the Digital Decade targets¹⁷. Over half of these funds are to be spent on digital public services and infrastructure. The plan focuses on rolling out 5G networks, digitalising public services, and creating innovative solutions for transport.

The first disbursement of EUR 649.5 million relate to 31 out of 33 milestones, including all submitted digital ones. Milestones related to the digital transition cover the 5G spectrum auction, measures enabling the digitalisation of public services (a Competence Centre for Digital Transformation and Open Data) and the preparatory work on a project on innovative solutions in transport.

¹⁷ See footnote 1.

Digital Decade Country Report 2023: Luxembourg

Luxembourg is expected to make a very strong contribution to the collective efforts to achieve the EU's Digital Decade targets. It is progressing well in its digital transformation with positive effects in the surrounding regions, notably in terms of innovation in data centers and digital administration as well as more skilled workforce. In 2022 Luxembourg increased the number of ICT specialists employed and of ICT graduates, and it made progress in fixed broadband take-up, the coverage of 5G mobile networks and the offer of digital public services for citizens. It also complemented its high performance computing (HPC) ecosystem built upon the Meluxina supercomputer with a new university master programme. However, gaps remain in take-up of gigabit subscriptions and the coverage of fixed gigabit network. Further efforts are needed as regards skills of the existing workforce and digitalisation of businesses, in particular SMEs. While Luxembourg has an overview of the digital strategies run by each Ministry, it lacks a consolidated strategic document for digitalisation towards 2030.

Luxembourg is collaborating with other Member States in exploring the possibility to set up a **European Digital Infrastructure Consortium (EDIC)** on Genome, to enable effective and secure cross-border access to repositories of personal genomic datasets.

DIGITAL SKILLS

Luxembourg is performing well in view of the Digital Decade target on digital skills, with 64% of its population aged 16-74 possessing at least basic digital skills. Luxembourg is currently implementing several measures intended to increase the level of basic and advanced digital skills.

The country is also well above the EU average for the number of ICT specialists represented in total employment (7.7% vs. 4.6%). The share of women among ICT specialists is, at 20.7%, also above the EU average of 18.9%. In addition, the Ministry of National Education, Children and Youth created the Digital Learning Hub (DLH) which aims to reduce the digital skills gap. The DLH offers short term training courses in different fields of ICT and is aimed at IT experts, novices, jobs seekers and youngsters as regards up-skilling and re-skilling. Among other initiatives, university curricula have been created to educate IT specialists while labour market needs are carefully monitored.

Luxembourg should continue implementing its policies in the area of digital skills. In particular, Luxembourg should encourage employers to strengthen the digital skills of employees (public and private) and workforce participation in digital training.

DIGITAL INFRASTRUCTURE

Luxembourg is one of the EU's best performers in digital infrastructure. Concerning connectivity, the strategy for ultra high-speed broadband was published in 2021 covering the period until 2025 and is currently being implemented. There has been a steady increase in very high capacity network coverage, from 91.7% in 2020 to 93.3% in 2022. Further roll-out of fibre will play an important role to play in meeting the Digital Decade target, as cable networks have followed their upgrade to the DOCSIS 3.1 standard. Further measures to facilitate the roll-out of these networks would be highly beneficial. Overall 5G coverage has increased to 93%, which is well above the EU average of 81%. Luxembourg has a strong high performance computing ecosystem.

Luxembourg should continue implementing its policies on digital infrastructure. In particular, it could take additional measures to incentivise the take-up of gigabit and 5G connectivity and continue efforts on the roll-out of gigabit connectivity, in particular streamlining the permit procedures and facilitating access to public property to extend fixed and densify mobile networks. Luxembourg should also develop further actions in the field of edge nodes and quantum in order to help the EU become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

With 66% of SMEs having at least a basic level of digital intensity, Luxembourg performs slightly below the EU average of 69%. In particular, the proportion of businesses using cloud services was below EU average in 2021. Attention should also be paid to supporting the development and deployment of other advanced technologies, such as AI and big data. Current policy measures are focussed on upskilling the workforce and helping innovative start-ups to grow. On cloud computing, Luxembourg takes part in the *Important Project of Common European Interest on Next Generation Cloud Infrastructure and Services* (IPCEI-CIS) which aims to equip the EU with the next generation of advanced, distributed, secure, sustainable and innovative cloud-to-edge capabilities.

Luxembourg should step up its efforts in the area of digitalisation of businesses. Particular attention should be paid to supporting the development and deployment of advanced technologies, including AI, big data, and especially cloud computing among enterprises, in particular in SMEs, including through incentives for investment, as well as capacity and knowledge building. Luxembourg should also reinforce the dissemination and exploitation efforts and the implementation of strategies jointly developed by both public and private actors to strongly boost the use of new advanced cloud solutions among SME ecosystems.

DIGITALISATION OF PUBLIC SERVICES

The country performs particularly well in making digital public services available to citizens (score of 95) and businesses (score of 97), very close to the Digital Decade target score of 100. The Ministry for Digitalisation's central coordination role has led to further improvements in digital public administration. Convenient features such as videoconferencing with the administration, the possibility to use mobile apps and electronic wallets are being added. Luxembourg has a national e-ID scheme in place in line with the eIDAS Regulation and it is developing a national electronic wallet. However, Luxembourg performs particularly low on the degree of online access to electronic health records for citizens, which stands at 67 out of 100 index points.

Luxembourg should continue implementing its policies to digitalise public services. In particular, Luxembourg authorities should continue their digital public administration initiatives and keep their high level of ambition. Access to open data should be improved. Luxembourg should improve access to electronic health records, ensuring a timely updated minimum set of health-related data stored in public and private electronic health-record systems.

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

Luxembourg's RRP amounts to EUR 82.7 million and 30% of it (i.e. EUR 24.5 million) is devoted to the digital transformation.¹⁸ Digital reforms and investments that were meant to be implemented in 2022 were: (i) the launch of the single digital register of health professions, with at least 5,000 professionals registered; (ii) the launch on the national e-health platform of the 'IdeoPHM' tele-monitoring solution replacing the previous 'Maela' solution, which allows for remote medical follow-up between doctors, dentists or midwives and patients; (iii) the successful connection of at least two sites that form part of the Luxembourg Quantum Communication Infrastructure (LuxQCI) Laboratory through the establishment of a terrestrial network; (iv) the successful connection of the space and terrestrial segments of the QCI through a key management system; (v) a cross border connection set up to demonstrate a land-based quantum key distribution system; (vi) the integration of a functionality regarding videoconference appointments into the MyGuichet.lu e-Government portal and the implementation; and (vii) availability of twelve new services for citizens and businesses, accessible via MyGuichet.lu.

¹⁸ See footnote 1.

Digital Decade Country Report 2023: Malta

Malta is expected to make a very strong contribution to the collective efforts to achieve the EU's Digital Decade targets. Malta has made significant progress, especially on connectivity and digital public services, but further efforts are needed on digital skills and the digitalisation of businesses. Encouraging people to boost their digital skills is crucial to ensure people and businesses in Malta can maximise their use of the available gigabit internet and digital public services. The new digital strategy, [Malta Diġitali Strategy 2022-2027](#), is aligned with the Digital Decade Policy Programme.

Malta is currently only involved as observer in the work aiming at the set-up of a **European Digital Infrastructure Consortium (EDIC)** on the Innovative Massive Public Administration inter-Connected Transformation Services, to develop a new generation of advanced cross-border services.

DIGITAL SKILLS

More than one third of Malta's population does not have at least basic digital skills. The percentage of the population aged 16-74 with at least a basic level of digital skills in Malta is 61%, higher than the EU average (54%). Yet, remaining gaps especially among less educated and older people inhibit an even bigger contribution to achieving the Digital Decade target (80%) as well as the objectives to bridge digital divides. The percentage of ICT specialists in the Maltese workforce is 4.8%, slightly above EU average (4.6%) but not sufficient to meet labour market demands. The share of women among the ICT specialists is, on the other hand, slightly below the EU average (18.2% vs. 18.9%). Malta's [eSkills strategy 2022-2025](#) provides a framework for coordinating and expanding digital skills initiatives to address persistent skills gaps and shortages.

Malta should continue its efforts in the area of digital skills. To further narrow the digital divide, Malta should encourage people to take part in digital skills training by raising awareness and facilitating access, with a special focus on vulnerable groups. Moreover, Malta should continue skill forecasting and improve cooperation with industry and civil society to regularly evaluate and adjust education and training offers to labour market needs and encourage women to become ICT specialist.

DIGITAL INFRASTRUCTURE

Malta has reached the Digital Decade targets for connectivity; however, there is room for improving coverage on essential spectrum bands for advanced applications requiring large spectrum bandwidth. At 20%, 5G coverage on the 3.4-3.8 GHz pioneer band is significantly below the EU average of 41%. Spectrum in the 700 MHz and 26 GHz bands remains unassigned. Malta made substantial progress on fibre, which now covers more than half of the country (56%), but take-up of fixed very high speeds continued to improve slowly in 2022.

Regarding other digital infrastructures, Malta participates in the Important Project of Common European Interest (IPCEI) on Microelectronics and Communication Technologies with 1 direct participant active in advanced packaging, and is also active in a European network of public organisations funding quantum-related research and innovation projects. Moreover, Malta participates in the network of European Digital Innovation Hubs in 2022. It is expected to house a high-performance computer for test use by Maltese SMEs and start-ups.

Malta can capitalise its strengths in digital infrastructure and technologies to support its green transition.

Malta should continue implementing its policies on digital infrastructure. Malta should regularly assess emerging market demand in the 700 MHz and 26 GHz bands. In parallel, Malta should step up efforts to incentivise the take-up of gigabit and 5G connectivity, including by accelerating the development of 5G ecosystems throughout the country. Malta should cooperate with other Member States, for example, on using digital technologies to address environmental challenges, facilitate

traffic and energy management as well as long-term sustainable city planning. Malta's activities in the development of infrastructure for advanced technologies such as semiconductors and quantum computing should be sustained in order to help the EU become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

Maltese businesses boast a high level of digitalisation and, with targeted support and better access to skilled labour, can further maximise digital technologies to become more resource efficient and innovative. A large majority (78% in 2022) of Maltese SMEs have at least a basic level of digital intensity and Maltese enterprises overall have continued to perform well above EU average in using cloud solutions (48% vs 34% in 2021), and, to a lesser extent, AI (10% vs 8% in 2021). However, difficulties in attracting and retaining skilled workers inhibit businesses from investing more in digital technologies and further contributing to achieving the Digital Decade targets. Malta is home to three unicorns, and the government has announced additional support for start-ups with a focus on maximising existing strengths in the maritime sector and iGaming. The country is in the process of joining the Europe Startup Nations Alliance to further improve conditions for start-ups. Following the launch of the [National Cyber Security Strategy 2023-2026](#), Malta introduced the [Mind the Gap](#) Project in early 2023 to help local businesses assess and improve their cybersecurity levels.

Malta should continue implementing its policies in the area of digitalisation of businesses. In particular, Malta should further facilitate access to secure and sovereign advanced digital technologies and solutions and encourage investment in digital research and innovation. It should raise awareness about the benefits of digital technologies and to increase participation in existing funding schemes, especially among the many family-owned micro, small and medium-sized businesses making up Malta's economy.

DIGITALISATION OF PUBLIC SERVICES

With scores of 100 (for citizens) and 97 (for businesses), Malta is nearing the Digital Decade target. Thanks to being subject to an early focus and ongoing investment, supported by RRF funds, key public services for citizens and businesses are largely available online through the [servizz.gov](#) portal. Malta's electronic identification (eID) scheme, notified to the Commission under the eIDAS Regulation, can be used to log in to 91% of online public services. Malta is also working on expanding access for citizens to electronic health records and is seeking to improve its current score of 78 out of 100 (compared to 72 for the EU overall) by making available more electronic health data including from private healthcare institutions. In contrast, Malta scores very low on facilitating access to and use of open data, an area where it could contribute more to achieving key objectives and principles of the Digital Decade as regards building on the use of government information to promote innovation and accountability. Malta's new [Public Administration Data Strategy 2023-2027](#) is expected to provide a framework for fostering open data policies and practices in the country.

Malta should continue implementing its policies to digitalise public services. In particular, Malta should monitor the effective use of digital public services as well as possible divides. Regarding e-health, Malta should continue efforts to connect additional types of healthcare providers to e-health records. Moreover, it should promote digital skills development among public officers, particularly in the health and justice system. Significant measures are needed to make more and higher quality public sector data available, both by developing open data policies and expanding the national data portal.

Malta's amended RRP devotes EUR 67.6 million (26%) to the digital transformation, of which a large part is expected to contribute to the Digital Decade targets¹⁹. The first payment related to, among others: (1) the adoption of a [Smart Specialisation Strategy](#) in 2021, identifying digital technologies as a priority investment area; (2) legislative amendments allowing for more use of digital technologies in court proceedings.

¹⁹ See footnote 1.

Digital Decade Country Report 2023: Netherlands

The Netherlands has historically been a frontrunner in digital transformation in Europe, expected to make a very strong contribution to the collective efforts to achieve the EU's Digital Decade targets. Its national digital transformation working agendas have been or are in the process of being developed with references to the Digital Decade Policy Programme. However, further measures are needed as regards the use of AI by businesses, and the availability of ICT specialists and graduates on the Dutch labour market.

The Netherlands is collaborating with other Member States in exploring the possibility to set up **European Digital Infrastructure Consortia (EDICs)** on: (i) establishing an Alliance for Language Technologies, to develop a common infrastructure in the field of natural language processing and to develop large multi-language models; and (ii) Mobility and Logistics Data, to enable the access, sharing and reuse of data in these domains.

DIGITAL SKILLS

The Netherlands has a population that has a high level of digital skills, expected to make an important contribution to reaching the Digital Decade target. 79% of individuals aged 16-74 in the Netherlands have at least basic digital skills, a number which nears the 80% Digital Decade target for basic digital skills and is far above the EU average of 54%.

7.2% of individuals in employment in the Netherlands are ICT specialists, compared to 4.6% in the EU. However, the percentage of ICT graduates in the Netherlands is lower than the EU average with 3.7% vs. 4.2%. A new action plan was introduced to solve the shortages in the labour market, which is essential for a successful digital and green twin transition in the Netherlands. Furthermore, action is being taken to improve digital skills both at the level of foundational education as well as to advance digitalisation in higher education. Lastly, with the proportion of women ICT specialists standing at 19.4% (which is slightly above the EU average), a gender balance in ICT specialists is far from being reached.

The Netherlands should continue implementing its policies in the area of digital skills. In particular, action is encouraged to step up upskilling and reskilling in the field of digital skills in the labour market as well as to achieve a more gender balanced specialist ICT workforce.

DIGITAL INFRASTRUCTURE

The Netherlands has traditionally displayed a strong performance in the field of digital infrastructure, although recent developments show signs of stagnation. Regardless, its fixed very high capacity network coverage stands at 98% vs. the EU average of 73%. However, the take-up of gigabit connectivity is non-existent. The Netherlands boasts 100% 5G coverage but has not assigned the 3.6 GHz band on time.

Measures taken by the Netherlands in the field of semiconductors and quantum computing are an important contribution to the EU's efforts. The Dutch semiconductor equipment industry holds a key position globally. This position is further enforced through almost EUR 1 billion in public funding to NXTGEN HIGHTECH and PhotonDelta as well as through participation in the IPCEI Microelectronics and Communication Technologies with 5 direct participants active in equipment, devices, automotive, telecom and photonics. A co-investment by the Dutch government in edge nodes has been made through the Important Project of Common European Interest on Next Generation Cloud Infrastructure and Services (IPCEI-CIS). Lastly, Quantum Delta NL has been awarded EUR 615 million to implement the Dutch quantum agenda. This is in addition to the significant role the Netherlands plays in the field of quantum through various European quantum projects.

The Netherlands should accelerate its efforts on connectivity infrastructure, in particular Gigabit coverage. The Netherlands should take all steps necessary to assign the 3.6 GHz band for mobile

communications without any further delay, in line with its obligations under EU law. It should furthermore consider taking measures to incentivise the take-up of gigabit connectivity.

Measures taken by the Netherlands in the field of semiconductors, edge nodes and quantum computing should continue in order to help the EU to become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

Many Dutch businesses are already taking advantage of the benefits of digitalisation. SMEs in the Netherlands do better than the EU average in terms of at least a basic level of digital intensity, scoring 80%. When it comes to advanced digital technologies, the indicators for big data (2020), cloud and AI (2021) were above the EU average, at 27%, 60% and 13% respectively, but the Netherlands has the potential to further contribute to reaching the Digital Decade target at EU level. Six European Digital Innovation Hubs (EDIH) have been set up and started their work at the beginning of 2023. The high number of unicorns originating from the Netherlands (24), as well as a further 39 businesses that can be considered potential future unicorns, demonstrates the existence of a thriving start-up ecosystem. The Netherlands is also a signatory to the Europe Startup Nations Standard. According to the European Deep Tech Report 2023, Amsterdam-Delta is considered one of the best EU start-up ecosystems.

The Netherlands should continue implementing their policies in the area of digitalisation of businesses. In particular, the Netherlands should continue helping SMEs to access advanced technologies, especially big data, cloud and AI, through sustained measures to promote their development and take-up.

DIGITALISATION OF PUBLIC SERVICES

On digitalisation of public services, the Netherlands scores high across the board. With a score of 85 (vs. the EU average of 77) and 89 (vs. the EU average of 84) respectively, many digital public services are available to citizens for life events and to businesses for regular business operations. All citizens and businesses in the Netherlands have the possibility to make use of a national eID. The level of access to e-health records is broadly in line with the EU average, with a score of 69 against 72. However, access to these records remains limited and fragmented. The decentralised development by the private sector of tools to bring together e-health records in centralised portals is being encouraged. Lastly, the new framework laws setting rules on digital interactions with public authorities and the digital exchange and availability of medical records are a welcome step in further digitalising public services in the Netherlands. However, its success and added value to citizens will depend on the detailed rules that are to follow and their proper and timely implementation by the involved stakeholders, both public and private.

The Netherlands should continue implementing its policies to digitalise public services.

Digital in the Netherlands' Recovery and Resilience Plan (RRP)

The Dutch RRP devotes EUR 1.2 billion (25.6%) to the digital transformation, of which EUR 834.4 million is expected to be spent on measures contributing to achieving the Digital Decade targets²⁰.

The component dedicated to accelerating the digital transformation is divided into three categories: investments to promote innovative technologies and digital skills; future-proofing the mobility sector; and future-proofing the government's IT infrastructure. In this first category, there are measures on AI and quantum, which are further detailed in the country report. Furthermore, an investment to give an impulse to digitalisation in education is part of the plan.

²⁰ See footnote 1.

Digital Decade Country Report 2023: Poland

Poland has scope to improve its performance in the digital transition and to contribute to the collective efforts to achieve the EU's Digital Decade targets. There has been progress in the digitalisation of public services, with notable improvements to the flagship e-Government app and in e-health. Poland has also made progress on skills, but it should strive further to achieve the Digital Decade targets. Efforts in digital infrastructures also need to be stepped up, as 5G core spectrum bands are still not available, and the EU regulatory framework is not in place. At the same time, operators have continued to invest in fixed connectivity. The coordination of digital policies was moved to the newly re-created Ministry of Digital Affairs on 1 May 2023.

Poland is collaborating with other Member States in exploring the possibility to set up **European Digital Infrastructure Consortia (EDICs)** on: (i) establishing an Alliance for Language Technologies, to develop a common infrastructure in the field of natural language processing and to develop large multi-language models; and (ii) Innovative Massive Public Administration inter-Connected Transformation Services, to develop a new generation of advanced cross-border services. Poland is one of the Member States that have jointly submitted a formal application to set up the European Blockchain Partnership and the EDIC on European Blockchain Infrastructure, supporting EU-wide cross-border public services.

DIGITAL SKILLS

The most recent figures on digital basic skills put Poland below the EU average and show a considerable gap with the EU Digital Decade target of 80%. In 2021, 43% of people aged 16-74 had at least basic digital skills (EU 54%) and 21% had above basic digital skills (EU: 26%). Nonetheless, the education system continued to mainstream ICT in the curricula and provide funding for schools and other entities. The activities of NGOs were a major force in providing support outside the formal system, including activities financed from public funds, with initiatives such as [Zdalna Szkoła+](#) (Remote School), [Lekcja:Enter](#), or [Digital Festival](#) providing support to remote education and other digital activities. The recent adoption of the Digital Competence Development Programme is likely to improve the coordination of governmental policies in this area, while actions focused on digitalisation of for schools could be strengthened. In Poland, the share of ICT specialists in total employment is 3.6%, below the EU average of 4.6%. Moreover, the share of women among ICT specialists is, at 16.7%, also well below the EU average of 18.9%

Poland should step up its efforts in the area of digital skills. In particular, Poland should strengthen digital skills in primary, secondary, and vocational education and training and step up the upskilling and reskilling of the labour force, paying special attention to advanced and emerging technologies.

DIGITAL INFRASTRUCTURE

There has been a steady increase in the percentage of households covered by fixed very high-capacity networks: 71% in 2022 compared to 65% in 2020 and close to the EU average of 73% while still below the EU target of gigabit connectivity everywhere. The situation is less positive in mobile connectivity with 63% of households covered by 5G in 2022, which is below the EU average of 81%. 5G has been provided based on frequency bands other than the 5G priority ones that enable enhanced services, because the auctions had been delayed with the 3.6 GHz one launched only in June 2023. On the regulatory side, the European Electronic Communication Code which was expected to be adopted in December 2020, has not been transposed into national law. On quantum computing, Poland takes part in LUMI-Q, a multinational consortium working to provide a Europe-wide quantum computing environment and a Quantum Hub was launched to develop and implement quantum computing technologies. Poland is a member of the EuroHPC Joint Undertaking on high-performance computing and of the European Blockchain Partnership. It launched the European Blockchain Service Infrastructure node in 2022 and has developed various parts of the system since

then. Poland is participating in the Important Project of Common European Interest (IPCEI) on Microelectronics and Communication Technologies with one direct participant active in photonics, and private investments in a large chips back-end manufacturing plant have been announced.

Poland should step up its efforts on connectivity infrastructure. To incentivise the development of robust connectivity, the current EU regulatory framework needs to be transposed into the national regulations. The assignment of the radio spectrum needed for 5G connectivity in a transparent, open and non-discriminatory way is also necessary to achieve the Digital Decade 5G targets. Measures taken by Poland in the field of semiconductors and quantum computing should continue in order to help the EU to become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

Poland's performance remains below the EU average with significant progress still needed in terms of the uptake of advanced technologies. In the area of advanced technologies, in 2021 19% of companies were using cloud solutions, but only 3% used AI and in 2020 9% used big data analysis. 61% of Polish SMEs have at least a basic level of digital intensity, which is below the EU average of 69%. Nonetheless, in 2022, the integration of digital technology in businesses' activities has progressed steadily. Various governmental bodies supported this drive using public funding, in particular from EU funds.

Poland should significantly step up its efforts in the area of digitalisation of businesses. In particular, Poland should facilitate access to advanced technologies including AI, big data and the cloud through sustained measures including improved access to training, incentives and knowledge transfer. It should also continue to support SMEs in their efforts to raise their uptake of advanced technologies and by encouraging start-up ecosystems.

DIGITALISATION OF PUBLIC SERVICES

Poland is still underperforming in the online availability of digital services, scoring 60 on digital public services for citizens (EU average: 77) and 73 for businesses (EU average: 84). On e-Government services, 63% of internet users relied on e-Government services, which was converging close to the EU average of 74% in 2022. The mObywatel application is being further improved (covering a national ID card, driver's licence, or pensioner's card) and has gained popularity with 9.1 million users in December 2022. On access to e-health records, Poland scores at 86, significantly better than the EU average (72 in 2022). The Patient's Portal provides improved services capitalising on the successful introduction of e-prescriptions. The mobile version of the portal is being constantly upgraded. An IT tool is available to public administration for searching, comparing and purchasing cloud services, and has been complemented by a government cloud services.

Poland should step up its efforts to digitalise public services.

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

Measures contributing to the digital transition account for 21.3% (over EUR 7.5 billion) of the plan's total allocation, of which EUR 6.8 billion is expected to contribute to the Digital Decade targets²¹. They consist of rolling out connectivity, both fixed broadband and 5G, improving the delivery of public services to businesses and citizens as well as the digitisation of public administration, while strengthening their resilience and cybersecurity. Poland has yet to submit a payment request for the first tranche of the RRF money.

²¹ See footnote 1.

Digital Decade Country Report 2023: Portugal

Portugal is expected to make a positive contribution to the collective efforts to achieve the EU's Digital Decade targets. Progress has been made in improving the connectivity infrastructure for fixed and mobile networks, albeit major challenges still remain. Many people lack essential digital skills and the level of enrolment in ICT education programmes is low. To improve its digitalisation capabilities and the adoption of technology, Portugal needs to adopt comprehensive policies and quickly implement these.

Portugal is collaborating with other Member States in exploring the possibility to set up **European Digital Infrastructure Consortia (EDICs)** on: (i) establishing the European Cybersecurity Skills Academy; and (ii) establishing an Alliance for Language Technologies, to develop a common infrastructure in the field of natural language processing and to develop large multi-language models. Portugal is one of the Member States that have jointly submitted a formal application to set up the European Blockchain Partnership and the EDIC on European Blockchain Infrastructure, supporting EU-wide cross-border public services.

DIGITAL SKILLS

Portugal is making progress in basic digital skills, but a faster pace is necessary to contribute significantly to the Digital Decade target. Currently, 55% of its the population aged 16-74 has at least basic digital skills, while only 29% have above basic digital skills level.

Portugal also needs to expand its efforts to increase the number of ICT enrolments (ICT specialists make up 4.5% of total employment and 2.5% of graduates are in ICT, just below the EU average). The share of women among ICT specialists is however at 20.4%, above the EU average of 18.9%.

Portugal should accelerate its efforts in the area of digital skills. In particular, Portugal should accelerate the implementation of its digital skills programmes and reach a critical mass of people across all demographics. Portugal should encourage private sector investment in digital skills training and a culture of lifelong learning to adapt to evolving technologies and industry needs. Portugal should increase enrolments in ICT studies through targeted actions that ensure capacity, traceability, and evaluation, and provide funding, scholarships and incentives for ICT specialists.

DIGITAL INFRASTRUCTURE

Portugal performs particularly well on fixed very high-capacity networks (VHCN) and fibre to the premises coverage (93% and 91% respectively compared to the EU average of 73% and 56%) and on at least 100 Mbps fixed broadband take-up (77%). However, take-up of at least 1 Gbps (4.5%) and mobile broadband take-up (82%) are below the EU average. Overall, 5G coverage (70%) ranks below the EU average (81%). Portugal is implementing measures to help increase 5G network deployment, which is lagging behind, mainly due to delays in auctioning the 700 MHz and 3.6 GHz bands, and to uncertainty on the timing of the auctioning of the 26 GHz band.

Portugal is participating in the Important Project of Common European Interest (IPCEI) on Microelectronics and Communication Technologies ecosystem with associated participants (receiving aid below the GBER threshold).

Portugal should continue its efforts on connectivity infrastructure, accelerating those supporting 5G coverage. In particular, Portugal should implement measures to grant access to network infrastructure, further simplify processes and harmonise local regulations to accelerate the deployment of gigabit connectivity.

Portugal's efforts in the area of semiconductors should be sustained in order to help the EU become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

In 2022, 70% of SMEs in Portugal had at least the basic level of digital intensity, slightly ahead of the EU average (69%) in 2022. The proportion of enterprises using the cloud (29% in 2021) and big data (11% in 2021) has trailed behind the EU average of 34% and 14%. However, 17% of Portuguese businesses were using AI in 2021, more than twice the EU average. Portugal is implementing measures to boost enterprises' adoption of digital technologies: including test beds, Digital Innovation Hubs, a digital transition services catalogue, and a digital maturity assessment tool and certification. The RRP allocates funds for companies to set up testbeds under the national network of testbeds initiative on 5G, AI, big data and blockchain. Home to only one unicorn, Portugal could improve access to finance for innovative scale-ups to reach the Digital Decade target of doubling the number of unicorns. Public programmes and funding have contributed to Portugal's digitalisation, but the landscape of resources can be complex and businesses are sometimes facing challenges to gain access to them for their digitalisation.

Portugal should accelerate its efforts in the area of digitalisation of businesses. In particular, Portugal should simplify its application processes for public financing by using consistent eligibility criteria. Portugal should support the use of cloud computing while ensuring data privacy and security protection. Portugal should encourage the development of DIHs in particular by integrating them into the national framework for SME digitalisation, and encouraging collaboration between DIHs, businesses and other stakeholders.

DIGITALISATION OF PUBLIC SERVICES

Portugal has made digitalising public services a centrepiece of the modernisation of its administration by reducing the administrative burden and using ICT to deliver better public services. Online services for citizens stand at 78, while those for businesses are at 82, close to the EU average. Portugal is moving towards the Digital Decade target of 100% of EU citizens having access to a means of secure electronic identification (eID) recognised throughout the EU. In fact, making eID a priority has yielded positive outcomes such as the deployment of the Portuguese digital identification mechanisms and their adoption by the public, businesses and the public administration. While the eID Citizen card is mandatory, it can be challenging to use for some, particularly the elderly, disabled or people living in remote areas. Portugal scores 63, which is below the EU average, on access to electronic health data and improvements are necessary to give access to electronic medical results, reports and data from other healthcare providers in the public and private sectors.

Portugal should accelerate its efforts to digitalise public services. In particular, it should continue the outreach to inform the public about the advantages of eID, improve the eID application process, and develop user-friendly interfaces.

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

Portugal's RRP has allocated EUR 3.6 billion (22%) to the digital transformation. That allocation is also expected to contribute to the Digital Decade targets²². In February 2023, Portugal received its second disbursement of EUR 1.8 billion for digital measures, including the new Secure Mobile Communications System providing secure voice, messaging and video communication for government employees. The [Portugal Digital Academy](#) and *Employment+Digital* allow the public and businesses to assess their digital skills, get training plans and boost their digital skills. A [resolution](#) will make it possible to launch public tenders for the installation, management and operation of high-capacity networks in 'white areas'. Additionally, 17 Digital Innovation Hubs support companies in adopting automation technologies. The legal framework for digitalising the public administration has come into effect, including provisions for information security and cybersecurity.

²² See footnote 1.

Digital Decade Country Report 2023: Romania

Romania has scope to improve its performance in the digital transition and to contribute to the collective efforts to achieve the EU's Digital Decade targets. Romania performs well in fixed connectivity, especially fibre to the premises (FTTP), where it is still progressing rapidly, and in ICT graduates, with a high proportion of female ICT specialists, expected to make an important contribution to the achievement of the Digital Decade targets. There is also some progress in digital public services, where important planned measures are still to deliver results. There is limited progress on certain business digitalisation indicators. Significant efforts have to be made in basic digital skills and 5G coverage.

DIGITAL SKILLS

Romania is well below the EU average on both basic digital skills and ICT specialists, with a particularly wide gap on at least basic digital skills (28% vs 54% EU average) where the EU target is at 80% of the population aged 16-74 having these skills. The proportion of ICT specialists in total employment is 2.8%, versus the EU average of 4.6%. Nonetheless, the proportion of ICT graduates among all graduates is significantly higher than the EU average (6.9% versus 4.2%). Romania also has one of the highest proportions of female ICT specialists in the EU, at 25.2%. Sustained, comprehensive efforts in the areas of basic digital skills and ICT specialists are paramount for Romania's digital transformation. Romania started to implement several important measures under its RRP, including setting up a new legislative framework for the digitalisation of education and the launch of various grant schemes.

Romania should significantly step up its efforts in the area of digital skills. In particular, Romania should further involve private stakeholders in the development and delivery of policies for digital skills. Romania should also pay special attention to reinforcing efforts for upskilling and reskilling, as well as to the attraction and retention of ICT specialists.

DIGITAL INFRASTRUCTURE

Connectivity is the area on which Romania scores best, fulfilling one of the preconditions for a successful digital transformation. 96% of Romanian households already have access to Gigabit/FTTP networks, which is well above the EU average (73% for VHCN coverage and 56% for FTTP coverage). However, 5G coverage is at 27%, well below the EU average of 80%. Several measures implemented in 2022 under the Romanian RRP are expected to lead to progress in this area, in particular the new 5G network security law, the implementation of various recommendations set out in the EU connectivity toolbox, and an auction for 5G licenses with important coverage obligations running in some cases until 2033.

On the semiconductor target, Romania is making a significant contribution, via the RRP, to the IPCEI on Microelectronics and Communication Technologies with 3 direct participants active in devices and sensor for automotive, aerospace/defence and biomedical applications. Romania is also involved in the EuroQCI initiative to build a pan-European quantum communication infrastructure and is developing further competences in quantum.

Romania should accelerate its efforts on connectivity infrastructure, notably on the roll-out of 5G connectivity, exploring all available sources of financing to shoulder private investments in the areas which are not commercially viable.

Romania's efforts in the area of semiconductors and quantum should be sustained in order to help the EU become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

The digitalisation of businesses remains a major challenge in Romania. The take-up of advanced technologies like cloud computing services, artificial intelligence and big data have been significantly below the EU average. The gap with the EU average is slightly smaller for SMEs with at least a basic level of digital intensity, at 53%, compared to an EU average of 69% in 2022. Several ongoing measures are expected to lead to progress in the area, including a support scheme under the RRP, aimed at both the development and the take up of digital technologies by SMEs, and an ongoing ERDF measure aimed at developing innovation clusters, and thereby a more innovation driven ICT sector.

Romania should significantly step up its efforts in the area of digitalisation of businesses. In particular, Romania should scale-up measures to support the digitalisation of businesses and help create a business environment with a stronger focus on innovation.

DIGITALISATION OF PUBLIC SERVICES

Romania performs significantly below the EU average on the availability of digital public services for citizens (score 48 against the EU average of 77) and for businesses (a score of 45 against the EU average of 84). Only 24% of Romanian online users actively use e-Government services, compared with an EU average of 74%. Significant efforts are nonetheless ongoing to digitally transform public services, with many projects, funded under the RRP, expected to bring more services online, reduce fragmentation, improve interoperability and remove bureaucratic barriers. In 2022, the legislative framework necessary for creating a government cloud entered into force, including the Emergency Ordinance setting up the Government cloud no. 89/2022 and the Interoperability Law no. 242/2022. Currently, no electronic identification (e-ID) scheme has been notified by Romania. However, a pre-notification is ongoing and the RRP includes measures to deliver electronic ID cards to 8 million citizens by 2026. On access to electronic health records, a centralised access service for citizens exists, but efforts are needed to further roll-out the access services across the entire population as well as to different types of healthcare providers. The Romanian RRP provides for significant investments for deploying an e-health digital infrastructure and telemedicine services for patients and caretakers.

Romania should step up its efforts to digitalise public services. In particular, it should continue to implement the planned measures swiftly and effectively, including via the RRP, as they represent a major opportunity for the digital transformation of government, with significant benefits for citizens and businesses.

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

The Romanian Recovery and Resilience Plan devotes EUR 5.97 billion (20.5%) to the digital transformation, of which EUR 4.98 billion is expected to contribute to the Digital Decade targets²³. This includes measures such as the digital transformation of the public sector (in particular, a governmental cloud), digitalisation of education, support for the digitalisation of businesses and for digital R&D, cybersecurity and connectivity. A first payment of EUR 2.6 billion was disbursed to Romania in October 2022, covering, among other things, the setting up of the task force for digitalisation and, the adoption of the 5G security law and of the cybersecurity strategy. The second payment request, for which the Commission issued a partial positive assessment in June 2023, covers further major deliverables for Romania's digital transformation, including the 5G auction, further reforms for the government cloud and measures for the digitalisation of education.

²³ See footnote 1.

Digital Decade Country Report 2023: Slovakia

Slovakia has scope to improve in the digital transition and to contribute to the collective efforts to achieve the EU's Digital Decade targets, particularly in the field of digital skills and digital public services where progress is evident. However, despite recent advances, Slovakia should scale up efforts in the digitalisation of businesses and connectivity, in particular in the roll out of 5G. Slovakia is participating in the multi-country project aimed at deploying 5G corridors across Europe. In December 2022, the Slovakian government adopted the Action plan for the digital transformation of Slovakia for 2023-2026 and the National digital skills strategy of the Slovak republic and action plan for the years 2023-2026. Together with the strategy document 'The National Concept of Informatization of the Public Administration for years 2021-2026' adopted at the end 2021, these documents are aligned to the Digital Decade Policy Programme.

DIGITAL SKILLS

Close to half of Slovakia's population does not have basic digital skills. Slovakia performs slightly better than the EU average on basic digital skills but, with 55%, it is significantly below the EU target of 80%. Further improvements in digital skills are essential.

The proportion of ICT specialists as part of total employment in Slovakia is 4.3%, slightly below the EU average of 4.6%. The proportion of ICT specialists has steadily increased since 2017. Of these ICT specialists, only 14.9% are women, which is one of the lowest shares in the EU. ICT graduates are above the EU average: 4.4% of graduates in Slovakia have an ICT degree. The 2023-2026 national digital skills strategy and action plan acknowledges the need to strengthen digital competences in Slovakia to be able to contribute to the collective efforts to achieve the Digital Decade target on 'at least basic' digital skills and on ICT specialists.

Slovakia should accelerate efforts in the digital skills area. Particular attention should be given to closing the digital gap, and to ensuring the inclusion of vulnerable groups in all digital trainings, to maintaining a positive trend for the number of ICT graduates as well as to the attraction and retention of ICT specialists.

DIGITAL INFRASTRUCTURE

Slovakia has made further progress on households covered by very high-capacity networks (71% compared to 67% in the previous reporting period). Despite the relatively low prices, the take up of very high-speed broadband services is still considerably lower than the EU average. With its national broadband plan (NBP), Slovakia seeks to provide all households with access to an internet connection of at least 100 Mbps. The NBP includes a further possibility of upgrading to gigabit speed. However, the plan is not yet fully aligned with the 2030 Digital Decade gigabit connectivity targets. Funding of EUR 112 million is available to support gigabit connectivity under the ERDF co-funded programme, which was approved in November 2022. Slovakia has also made significant progress in 5G coverage. Compared to the previous year, it increased by 41 percentage points and in 2022, 55% of populated areas were covered by 5G. Despite this progress, Slovakia remains significantly below the EU average of 81%. In terms of 5G coverage on the 3.4-3.8 GHz spectrum band, relevant for advanced applications requiring high bandwidth, at 39%, Slovakia is close to the EU average of 41%.

Slovakia is participating in the IPCEI on Microelectronics and Communication Technologies with 5 direct participants active in chip design and sensing, mostly for (edge) AI and biomedical applications.

Slovakia should step up its efforts on connectivity infrastructure, to accelerate both the rollout of gigabit and 5G connectivity, especially fibre to the premises in rural areas. The swift implementation of the ERDF measures is very relevant.

Slovakia's efforts in the area of semiconductors should be sustained in order to help the EU become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

Despite considerable progress, Slovakia still shows major gaps in the digitalisation of businesses, particularly regarding the share of SMEs with at least basic level of intensity (which, at 60%, is below the EU average of 69%) and in the take up of cloud solutions. The adoption of the 2023-2026 action plan for the digital transformation of Slovakia strengthens the country's commitment to improving its performance in this area and to achieving the common goal of reaching the Digital Decade target of at least 75% of businesses using cloud, AI or big data.

Slovakia should step up its efforts in the area of digitalisation of businesses. In particular, Slovakia should facilitate access to training, information and knowledge sharing and other supportive actions, including through European Digital Innovation Hubs, to make further progress in the digitalisation of businesses.

DIGITALISATION OF PUBLIC SERVICES

Overall, Slovakia has made efforts to improve its scores and ranking in digital public services, slowly approaching the EU average. However, citizens and businesses still face difficulties when using digital public services which are reported to lack usability and to have limited transparency. In particular, in 2022, Slovakia made some progress on the digitalisation of public services, reaching scores of 67 for citizens and 77 for businesses, but further efforts are needed to be able to reach the EU target of 100. The country has notified an eID scheme, accessible to 72% of its population. Slovakia is also involved (via public and private entities) in one large-scale pilot project testing the European Digital Identity Wallet in several everyday situations, funded under the Digital Europe programme. On access to e-health records, there is significant room for improvement (current score is 45).

Slovakia should step up its efforts to digitalise public services. In particular, it should monitor the effective use of digital public services as well as possible challenges for particular groups of citizens.

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

Slovakia's Recovery and Resilience Plan devotes EUR 1.3 billion (21%) to the digital transformation, of which EUR 1.2 billion is expected to contribute to the Digital Decade targets²⁴. Slovakia received two payment disbursements, which included a limited number of milestones and targets, focussing on cybersecurity in public administration and digital skills. The country adopted a national concept for informatisation in the public administration, aimed at updating cybersecurity requirements and at increasing the standardisation of solutions for all public administration entities. Furthermore, Slovakia completed the pilot phase of the 'senior tablet' project which distributed tablets to 1000 elderly and disadvantaged people and trained them on how to use the devices.

Slovakia plans to implement a few measures linked to digital, including the building of a network of four European Digital Innovation Hubs and two additional digitalisation centres, an action plan for the digital transformation of Slovakia 2023 –2026, and the national digital skills strategy. In April 2023, Slovakia submitted a modified RRP to take into account the decreased financial allocation (the grant allocation is reduced by EUR 321 million) and the integration of a REPowerEU chapter to reduce dependence on Russian fossil fuels and to support the green transition.

²⁴ See footnote 1.

Digital Decade Country Report 2023: Slovenia

Slovenia is expected to make a positive contribution to the collective efforts to achieve the EU's Digital Decade targets. Further efforts are needed to attain its level of ambition and to further contribute to achieving the Digital Decade targets and objectives, especially as regards ICT specialists and connectivity in rural areas, and its active involvement in multi-country projects on advanced technologies should be maintained. Slovenia is actively preparing a framework for its digital transformation: it has set up a Digital Transformation Ministry and adopted a comprehensive digitalisation strategy, [Digital Slovenia 2030](#), which is aligned with the Digital Decade Policy Programme.

Slovenia is collaborating with other Member States in exploring the possibility to set up **European Digital Infrastructure Consortia (EDICs)** on: (i) establishing an Alliance for Language Technologies, to develop a common infrastructure in the field of natural language processing and to develop large multi-language models; and (ii) the Networked Local Digital Twins Towards CitiVerse project, using disruptive and immersive technologies for future city related projects. Slovenia is one of the Member States that have jointly submitted a formal application to set up the European Blockchain Partnership and the EDIC on European Blockchain Infrastructure, supporting EU-wide cross-border public services.

DIGITAL SKILLS

At least basic digital skills are a bit less widespread in the Slovenian population aged 16-74 than in the EU on average (50% vs 54%). The share of ICT specialists in total employment is, in contrast to previous years, below the EU average (4.5% vs 4.6%) and continues to be below the current needs of the labour market. The share of women among ICT specialists is, at 17.6% also below the EU average of 18.9%. 78% of Slovenian enterprises reported difficulties in finding sufficiently skilled ICT specialists, which is the highest share in the EU. Slovenia is currently implementing several measures to increase the level of basic digital skills (e.g., the Promotion of Digital Inclusion Act) and the share of ICT specialists (e.g., the Platform for Competence Prediction and measures to attract foreign ICT specialists), but those are considered insufficient in view of the reported needs.

Slovenia should accelerate its efforts in the area of digital skills. Notably, Slovenia should increase the level of basic and, in particular, advanced digital skills to allow its population and economy to make full use of the potential of the digital transformation. It should strengthen early identification of labour market needs and further complement them by additional and quicker reactions, especially in digital upskilling-and reskilling and adapting the (higher) education curricula to the latest digital needs. A further reinforced collaboration between industries, (higher) education institutions, the public administration and relevant stakeholders can increase the effectiveness of those actions.

DIGITAL INFRASTRUCTURE

Slovenia performs well on fixed very high capacity (VHCN) and fibre coverage, but rural connectivity and overall 5G coverage remain a challenge. The coverage of fixed VHCN is slightly above the EU average (76% vs 73%). Further efforts are nonetheless needed, especially in rural areas, where only 51% of households are covered, and where the country's topography is a challenge. Overall 5G coverage has increased considerably (from 37% to 64%) but is still below the EU average of 81%. A key development in the area of connectivity was the transposition of the European Electronic Communications Code into national law. Furthermore, Slovenia is very active in developing infrastructure for advanced technologies and is participating in several multi-country projects, e.g., on the European High Performance Computing Joint Undertaking, the European Quantum Communication Infrastructure and the European Blockchain Infrastructure. Slovenia is contributing to the Important Project of Common European Interest (IPCEI) on Microelectronics and

Communication Technologies ecosystem with associate participants (receiving aid below the GBER threshold).

Slovenia should accelerate its efforts on connectivity infrastructure. It should continue and complement the efforts to address the connectivity challenges, especially in rural areas. Moreover, Slovenia's activities, including in multi-country projects, in the development of the infrastructure for advanced technologies like semiconductors, quantum computing and blockchain should be sustained in order to help the EU become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

Slovenia has a good performance in some areas related to the digitalisation of businesses, but there is room for improvement, especially given its ambitious target to be in the top 3 in the EU in this area by 2030. For advanced technologies, Slovenia performed well in the use of AI and cloud services but was far behind in analysing big data (7% compared to the EU average of 14% in 2020). The country performs slightly below the EU average for SMEs with at least a basic level of digital intensity (67% compared to 69% in 2022). There is currently no unicorn and no potential future unicorn. On the start-up ecosystem, there is room for improvement in the commercialisation of R&D in the ICT sector and in access to finance, notably equity, for start-ups/scale-ups. Slovenia is taking actions that are expected to address some of those challenges, e.g., via the Act on Forms of Alternative Investment Funds.

Slovenia should continue implementing its policies in the area of digitalisation of businesses, in particular by quickly implementing and complementing the efforts to provide supportive framework conditions, including a highly skilled workforce, especially for SMEs and start-ups.

DIGITALISATION OF PUBLIC SERVICES

Slovenia performs fairly well on the digitalisation of public services. It performs below the EU average for digital public services for citizens (its score of 71 is below the EU average of 77), but it is very close to the EU average for businesses (a score of 83 compared to the EU average of 84). The country performs above the EU average on the access to electronic health records for its citizens (a score of 80 compared to the EU average of 72). An electronic identity card was launched in March 2022 and was notified under the eIDAS regulation in May 2023. Slovenia has adopted several strategies to modernise its public services, including the [Digital Public Services Strategy 2021-2030](#) and the [e-health Strategy 2022-2027](#).

Slovenia should accelerate its efforts to digitalise public services. In particular, it should quickly translate the strategic orientations, in a participatory manner (e.g. including user feedback), into ambitious and concrete measures to provide efficient and user-friendly digital online services.

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

The Slovenian RRP amounts to EUR 2.5 billion and EUR 0.5 billion (21%) is devoted to the digital transformation, of EUR 471 million expected to contribute to Digital Decade targets²⁵. With its first payment request, amounting to EUR 49.6 million and disbursed in April 2023, Slovenia achieved four digital-related milestones and targets that focus on two areas. First, the digitalisation of the economy, including the identification of potential participants for the multi-country projects on the European Common Data Infrastructure and Services and on the Low-Power Processors and Semiconductor Chips. Second, the digitalisation of public services, e.g. the establishment of a State Administration Informatics Development Council. Slovenia is currently working on a revision of its RRP to take into account the decreased financial allocation (the grant allocation is reduced by EUR 286 million) and the integration of a REPowerEU chapter to reduce dependence on Russian fossil fuels and to support the green transition. A

²⁵ See footnote 1.

draft was opened to public consultation in March 2023 and [submitted](#) to the EU commission on 14 July 2023.

Digital Decade Country Report 2023: Spain

Spain is expected to make a positive contribution to the collective efforts to achieve the EU's Digital Decade targets. The Spanish authorities have made significant endeavours in recent years, laying the foundation for an ambitious digital transformation of the Spanish economy. Spain has made significant progress in all four dimensions of the Digital Decade. The 'Digital Spain 2026' strategy, which is aligned with the Digital Decade Policy Programme, was presented in 2022 to further promote the digital transformation through a set of reforms and significant public and private investments.

Spain is collaborating with other Member States in exploring the possibility to establish **European Digital Infrastructure Consortium (EDICs)** on: (i) the Alliance for Language Technologies, to develop a common infrastructure in the field of natural language processing and to develop large multi-language models; (ii) Genome, to enable effective and secure cross-border access to repositories of personal genomic datasets; (iii) and the Networked Local Digital Twins Towards CitiVerse project, using disruptive and immersive technologies for future city related projects.

DIGITAL SKILLS

More than one third of Spain's population does not have basic digital skills. Nonetheless, Spain is a good performer in at least basic and above basic digital skills, with 64% and 38% of the population benefiting from these skills respectively, which is above the EU average. The country continues to progress in increasing the percentage of ICT specialists the workforce, where it stands slightly below the EU average (4.3% vs 4.6%), and the percentage of ICT graduates, where it exceeds the EU average (4.8% vs 4.2%). The share of women among the ICT specialists is at 18% just below the EU average. This contributes to narrowing the gap to the continuously growing demand. Spain is implementing several measures to increase the number of ICT specialists, notably a new law to modernise the vocational education and training system (VET), approved in March 2022, and a new VET specialisation course on AI and big data.

Spain should accelerate its efforts in the area of digital skills, notably in the upskilling and reskilling of the labour force, in particular, in advanced and emerging technologies, to address the lack of ICT specialists. Additionally, Spain should continue to encourage more students to specialise in ICT and promote diversity and a gender-balanced uptake of this subject, reducing any possible stereotypes in the teaching and learning of informatics.

DIGITAL INFRASTRUCTURE

Spain is one of the EU's best performers in digital infrastructure, in particular in connectivity. In fixed very high-capacity networks it is significantly above the EU average (93% vs 73%), and in fibre to the premises coverage it exceeds the EU average by a wide margin (91% vs 56%). The country is only slightly above the EU average in overall 5G coverage (82% vs 81%) due to initial auction delays. However, Spain has now assigned 98% of all 5G pioneer bands and, under its RRP, it is implementing appropriate measures to achieve the Digital Decade targets. Spain adopted its new Telecommunication Law in 2022 and is promoting both 5G and broadband deployment. On semiconductors and cutting-edge technologies, in May 2022, Spain approved the Strategic Project for Economic Recovery and Transformation on microelectronics and semiconductors (PERTE Chip) to strengthen the industry's design and production capacity in Spain in order to foster national and EU strategic sovereignty. The country participates in the IPCEI on Microelectronics and Communication Technologies with 11 direct participants active in various fields (material, open-source design, equipment, packaging, connectivity, photonics). Spain is currently implementing several measures that could help achieve Europe's first computer with quantum acceleration by 2025.

Spain should continue implementing its policies on digital infrastructure, in particular accelerating 5G coverage. It should accelerate the setting up of 5G ecosystems in cities, factories and relevant

rural zones, and, in this context, encourage partnerships between innovative companies and large-scale companies providing the infrastructure to be deployed. Measures taken by Spain in the field of semiconductors and quantum computing should continue in order to help the EU to become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

The percentage of SMEs with a basic level of digital intensity is slightly below the EU average (68% vs 69%), although the Spanish authorities are making efforts to improve the enterprises' digitalisation. Concerning the integration of advanced technologies, 2022 data shows substantial progress as 12.3% of enterprises use AI and 14.3% use Big Data for internal analysis. Given its large number of SMEs and their important share in the Spanish economy, the reforms and investments aimed at improving scalability and digitalisation of SMEs will have an indirect multiplier impact. Spain launched the Digital Kit initiative to promote scalable, high-impact, and public-private collaboration mechanisms to accelerate the digitalisation of SMEs, and the Agents of Change programme to give SMEs grants to hire digital transformation experts. Under Spain's National AI Strategy, the country has taken important measures on AI which should support further development of these technologies and increase the take-up by enterprises. The country also participates in the IPCEI on Next Generation Cloud Infrastructure and Services. Additionally, several measures were launched to encourage a favourable environment for emerging companies and unicorns, notably the Start-ups Law.

Spain should continue implementing its policies in the area of digitalisation of businesses. In notably it should continue supporting the development and deployment of advanced technologies, in particular, in SMEs, and to provide supportive framework conditions for start-ups and scale-ups.

DIGITALISATION OF PUBLIC SERVICES

Spain is at the forefront of e-Government and digital public services in the EU and continues to update its services and infrastructure to bring them into line with rapid technological developments and the needs of citizens and businesses. Spain performs well above the EU average on the indicators measuring the number of internet users that use e-Government services (84% vs 74%), in digital public services for citizens (86) and for businesses (91), and in access to e-health records (83). Spain has one eID means, the Spanish ID card (DNIe) notified under the eIDAS regulation. Spain has made progress regarding the interoperability of digital public services at national, regional, and local levels.

Spain should continue implementing its policies to digitalise public services. Notably, it should continue to increase its efforts to connect additional kinds of healthcare provider to electronic health records until full coverage is achieved. Spain should also continue taking measures to ensure that a comparable quality of service and completeness of electronic health data is provided at regional level.

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

The Spanish Recovery and Resilience Plan devotes EUR 19.6 billion (28.2%) to the digital transformation, of which EUR 18.8 billion are expected to contribute to the Digital Decade targets²⁶. Spain has successfully submitted three payment requests, covering many important milestones and targets for digital measures including: (i) the [strategy for the promotion of 5G technology](#); (ii) the [SME Digitalisation Plan](#) for 2021-2025; (iii) the [national AI strategy](#); the assignment of the 700 MHz band and the legal act on the reduction of taxes on the 5G spectrum ; (v) the entry into force of Spain's General Telecommunications [Law 11/2022 of 28 June](#); (vi) the National Cybersecurity Industry Support program; and (vii) the [Organic Law 3/2022 of 31 March 2022](#) on the organisation and integration of vocational training. In June 2023, Spain submitted its addendum to the RRP, strengthening its digital dimension, which is being reviewed by the Commission.

²⁶ See footnote 1.

Digital Decade Country Report 2023: Sweden

Sweden is expected to make a very strong contribution to the collective efforts to achieve the EU's Digital Decade targets. Sweden has become digitalised at an early stage and has a long history of high connectivity and making use of digital tools. As a digitally mature country, Sweden continues to perform well across all dimensions of the Digital Decade. However, progress has slowed down on connectivity and Sweden continues to significantly lag behind on 5G coverage. The population has a high level of digital competences and skills, but it is a challenge to meet industry's the high demand for ICT specialists. The digitalisation strategy of 2017 underlines the importance of a digitally competent workforce; however, the strategy does not specify any targets.

DIGITAL SKILLS

Sweden population has a high level of digital skills and is expected to make an important contribution to reaching the Digital Decade target. In 2023, 67% of people aged 16-74 in Sweden had at least basic digital skills, above the EU average of 54%. Several ongoing initiatives seek to further improve the digital skills level of the Swedish population.

With 8.6%, the share of ICT specialists in total employment is well above the EU average (4.6%). The share of women among ICT specialists is, at 22.9%, also above the EU average (18.9%). However, industry underlines that the demand for ICT specialists is still not being met. It is important that Sweden steps up efforts to address this issue, also in view of contributing to the Digital Decade target on ICT specialists.

Sweden should continue implementing its policies in the area of digital skills. To meet the increasing demand for ICT specialists, Sweden should closely monitor plans to encourage more students to specialise in ICT by implementing specific, time-bound, and measurable actions that would improve traceability, evaluation, and follow-up of programmes and their impact on the population.

DIGITAL INFRASTRUCTURE

Sweden continues to make progress on fixed connectivity. However, it has started to fall behind the overall EU average. While most households have access to very high-capacity networks (85% vs. 73% in the EU overall), the roll-out of fibre has slowed down after peaking in 2016 and gaps in gigabit access, especially in rural areas (76% of households covered), still need to be addressed. The take-up of gigabit connectivity is only at 6.1%, below the EU average of 13.8%. On mobile connectivity, 5G network roll-out has sped up after delays in the auction of the relevant spectrum, but Sweden still lags far behind the EU on coverage (20% vs. 81%) and take-up. More needs to be done to complete the overdue assignment of radio spectrum in some of the 5G pioneer bands.

Regarding other digital infrastructures, Sweden participates in multi-country projects on acquiring supercomputers and quantum computers. Initiatives are also in place to support the production of semiconductors and the deployment of edge nodes, in line with Digital Decade targets.

Sweden should accelerate its efforts on connectivity infrastructure. In particular, Sweden should accelerate 5G roll-out in line with emerging market demand and by assigning the remaining spectrum in 5G pioneer bands. Specifically, Sweden should regularly assess emerging market demand for the remaining unassigned spectrum in the 26 GHz band (to incentivise and facilitate deployment of 5G services for advanced applications) and assign it when the demand emerges. Moreover, Sweden should assign remaining spectrum in the 2.1 and 2.6 GHz bands and 900 MHz band without further delay.

Measures taken by Sweden in the field of semiconductors, edge and quantum computing should continue in order to help the EU to become a strong market player in these areas.

DIGITALISATION OF BUSINESSES

Sweden is among the EU frontrunners regarding unicorns (37), and is expected to make a significant contribution to all Digital Decade targets in the dimension on the digitalisation of businesses. In 2022, 87% of SMEs in Sweden had reached at least a basic level of digital intensity (vs. the EU average of 69% in 2022), approaching the 2030 target of 90%. Between 2021-2024, the Swedish Agency for Economic and Regional Growth is implementing measures to strengthen micro and small businesses in rural areas through the possibilities of digitalisation.

Even though the percentage of Swedish enterprises that have taken up advanced digital technologies is higher than in the EU overall, more efforts are needed to help achieve the Digital Decade target, in particular on the uptake of AI (10% in 2021) and big data (19% in 2020).

Sweden should continue implementing its policies in the area of digitalisation of businesses. In particular, Sweden should continue to support the development and deployment of advanced technologies, including AI, big data, cloud computing, in particular by participating in relevant multi-country projects.

DIGITALISATION OF PUBLIC SERVICES

Sweden scores above average in terms of online provision of key public services for citizens and businesses (88/100 for both). Most public administrations are offering online interactions. Sweden has notified three means of eID under the Swedish eID (Svensk e-legitimation) scheme. In June 2022, the Government tasked the Agency for Digital Government (Digg) to analyse and submit proposals for the production and operation of a government eID. Digg subsequently outlined a proposal for a technical solution for a new eID. With a composite score of 70 out of 100, Sweden performs two points below the EU-average (72) on citizens' online access to their electronic health records. Sweden is gathering open data from public actors to make such data available to both public and private actors.

Sweden should continue implementing its policies to digitalise public services. In particular, it should ensure that all individuals have access to an eID scheme. Sweden should also increase its investments to support advanced digital technologies in its public services.

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

The Swedish RRP amounts to EUR 3.3 billion, of which EUR 650 million thereof dedicated to attaining the Digital Decade targets²⁷. The RRP will, in particular, promote broadband expansion by connecting more households in 2023-2025, with EUR 464 million of investment. Moreover, the plan includes investments in vocational and higher education (EUR 165 million), with a particular focus on digital skills to meet the future needs of the labour market. The RRP also allocates EUR 21 million to the upgrading of digital services in public administration, including a joint digital infrastructure. Sweden has not yet submitted its first payment request under the RRP. The Commission is currently reviewing the addendum to the RRP that Sweden submitted on 24 August 2023.

²⁷ See footnote 1.