Digital Decade Country Report 2023

Portugal

Introduction

Portugal is expected to make a positive contribution to the collective efforts to achieve the EU's Digital Decade targets. Comprehensive policies and swift implementation can optimise Portugal's digitalisation efforts, enhance capabilities and incentivise technology adoption. The country has shown a strong performance in connectivity infrastructure both fixed and mobile. Portugal is focusing efforts on reskilling its workforce and investing in digital skills for the older population, on the understanding that investing in education and training across various demographics is vital. By continuing to invest in digital skills development and digital public services, Portugal can advance its digital competitiveness and positively contribute to the EU's Digital Decade goals.

In 2022, digital policies came within the Prime Minister's responsibility, and a new Secretary of State for Digitalisation and Administrative Modernisation was appointed. This measure reflects the government's awareness of the cross-cutting nature of digital transition for the government, where such policies were previously coordinated by the Minister for Economy and Digital Transition. An inter-ministerial Commission for Digitalisation was set up, consisting of secretaries of state from all ministries, chaired by the Secretary of State for Digitalisation and Administrative Modernisation.

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 in Portugal's Recovery and Resilience Plan (RRP)

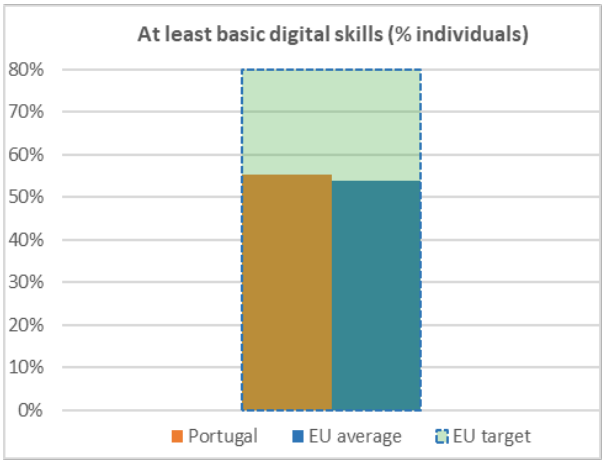
Portugal has allocated 22% i.e. EUR 3.6 billion of its digital expenditure in its RRP to prioritising digital skills, digital transformation in businesses and investments in public administration helping modernise public financial management. This allocation is expected to contribute to achieving the Digital Decade targets: EUR 816 million for basic digital skills, EUR 544 million to ICT specialists, EUR 1.3 billion to digital public services, EUR 360 million to e-health, EUR 213 million to unicorns and EUR 213 million for cloud, AI and big data[1]. 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 the Employment+Digital programme allow the public and businesses to assess their digital skills, get training plans and boost their digital skills. In December 2022, the government approved the national strategy for connectivity in Very High Capacity Electronic Communications Networks for 2023-2030. A resolution will make it possible to launch public tenders

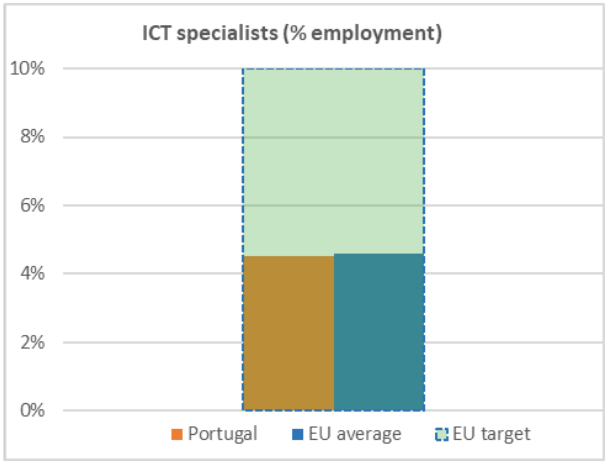
[1] Each Recovery and Resilience Plan must dedicate at least 20% of the plan's total allocation to digital objectives. To this end, the plans had to specify and justify to what extent each measure contributes fully (100%), partly (40%) or has no impact (0%) on digital objectives, using Annex VII of the RRF Regulation. Combining the coefficients with the cost estimates of each measure allows assessing to what degree the plan contributes to digital objectives and whether it meets the 20% target. Furthermore, a further qualitative assessment of the data took place to allow for an estimation of the possible contribution of RRF measures to the Digital Decade targets. 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.

to install, manage and operate high capacity networks in ‘white areas’. In addition, 17 digital innovation hubs support companies in adopting automation technologies. The country's legal framework for digitalising the public administration has come into effect, including provisions for information security and cybersecurity.

1 Digital skills

	Portugal			EU	EU
	DESI 2021	DESI 2022	DESI 2023	DESI 2023	2030 target
1a1 Internet use	**76%**	**80%**	**83%**	**89%**	
% individuals	2020	2021	2022	2022	
1a2 At least basic digital skills	**NA**	**55%**	**55%**	**54%**	**80%**
% individuals		2021	2021	2021	
1a3 Above basic digital skills	**NA**	**29%**	**29%**	**26%**	
% individuals		2021	2021	2021	
1a4 At least basic digital content creation skills	**NA**	**61%**	**61%**	**66%**	
% individuals		2021	2021	2021	
1a5 Enterprises providing ICT training	**23%**	**23%**	**24%**	**22%**	
% enterprises	2020	2020	2022	2022	
1b1 ICT specialists	**3.9%**	**4.7%**	**4.5%**	**4.6%**	**20 million**
% individuals in employment aged 15-74	2020	2021	2022	2022	**~10%**
1b2 ICT graduates	**2.3%**	**2.6%**	**2.5%**	**4.2%**	
% graduates	2019	2020	2021	2021	





Portugal scores around EU averages in basic digital skills and ICT graduates. **The government views a high value in boosting the digital skills of the public and it's the country's workforce as a requisite for digital leadership.** Portugal's RRP reflects that importance, allocating almost EUR 816 million to digital skills (22% of its digital funding)**.** A budget of EUR 1.41 billion is dedicated to investments in digital education for primary and secondary schools (EUR 559 million), public administration (EUR 86 million), vocational training (EUR 521 million), youth STEAM initiatives (EUR 130 m), and digital skills training for workers (EUR 100 m). A separate adult learning program worth EUR 14 m is also in place. Portugal's INCoDe.2030 programme is a major policy initiative for boosting the digital skills and qualifications of its population through customised trainings for various demographics. INCoDe.2030 focuses on five areas: I) training young people in digital skills, ii) professional training for adults, iii) digital technology training for the public, iv) higher-level training and v) production of new knowledge in disruptive technologies.

Portugal is advancing on basic digital skills, yet a quicker pace is needed to contribute significantly towards the Digital Decade target. Just over half of Portugal's population (55%) has at least basic

digital skills, while the share of those with above basic digital skills is 29%, slightly above EU averages of respectively 54% and 26%. The Portuguese with at least basic digital content creation skills account for 61%, trailing behind the EU average (66%). Given the stable trend over the years, Portugal is poised to contribute towards the 2030 EU target of at least 80% of the population having basic digital skills with gender convergence if it accelerates and scales up its efforts.

Portugal has implemented measures to boost the basic digital skills of adults. Digital competence is one of the core competences in the standard for adult education and training. At the basic level, digital competency covers information literacy, communication and citizenship, content creation, security and privacy. The national catalogue of qualifications incorporates digital literacy trainings for individuals aged 18+ who lack basic digital skills regardless of their employment status. The *Qualifica* programme uses the key competences standards for adult education and training at basic and upper-secondary levels, which include digital competence. Over 400 000 adults have already achieved full or partial qualification in digital competences through *Qualifica*, 56% of whom are adults with under upper-secondary education. In addition, the Digital skills certificate programme offers short and medium-term training on digital skills training to adults, enhancing increasing their employability. The strategy targets people with limited to no experience using the internet. Volunteers in training centres across Portugal offer online training free-of-charge on navigating the internet, using email and social media, and privacy and security standards. The training is approved by Estrutura de Missão Portugal Inovação Social and is funded by Social Impact Bonds. *Jovem+Digital*/*Young+Digital* trains unemployed young adults aged 18-35 in cybersecurity, e-commerce, data analysis, programming, UX/UI design and automation. When someone completes any short and medium-term course under this *Jovem+ Digital* programme they are awarded a certificate of qualifications for the specific course taken. However, only those who have gone through the entire programme will receive a **d**igital **s**kills certificate. Component 6 of the RRP aims to set up 225 local projects for basic qualifications, including digital competences for active adults aged 23+ without upper-secondary education, involving basic literacy, numeracy and digital skills. The *Qualifica Accelerator* aims to stimulate adult participation and certification through recognition, validation and certification of competences (RVCC). The goal is to reach 100 000 RVCC certifications by 2025.

Portugal is also improving digital education in schools. As part of its RRP, the Ministry of Education is involved in developing digital educational resources for all subjects on the curriculum. RRP component 20 focuses on installing 1 300 digital laboratories in basic and secondary schools. The main goal of the initiative is to boost skill development and promote STEAM subjects (Science, Technology, Engineering, Arts, and Mathematics). To bolster digital literacy among students under 18, Portugal has rolled out the School Digitisation Programme (2021 -2026). It aims to equip students and teachers with the tools and resources to enhance boost their digital skills by e.g. distributing of computers, increasing connectivity, and providing access to high-quality digital educational materials. The programme's total budget is EUR 687 million, derived from PT2020 and RRP sources, to be allocated until 2025.

The COVID-19 lockdowns highlighted the need for Portuguese teachers to boost their digital pedagogical skills. To address this, the Ministry of Education launched a national teachers' digital training plan with the support of the 91 national teacher training centres. The plan is organised according to DigCompEdu, and aims to integrate digital technologies into the teaching and learning processes. Over 90 000 public school teachers out of around 111 000 have completed their training.

Schools were also invited to prepare their own action plans for digital development, based on the results of the SELFIE tool and DigComOrg. These plans aim to improve digital development at organisational, pedagogical and technological levels.

Beyond the RRP, the government is rolling out initiatives for the skilling, upskilling and reskilling of the workforce. To address the demand for digitally skilled workers in the business sector, the government introduced *the Employment+Digital* programme in collaboration with SMEs and social sector organisations. It encompasses four measures: i) *Training Employment +Digital* for customised digital skills courses for employees; ii) *More Digital Leader* offering advanced digital skills training for managers; iii) *More Digital training voucher* for individuals to acquire digital skills and qualifications; and iv) *More Digital Trainer* to increase the number of certified professional trainers. The programme's budget is financed by RRP's component 16 Companies 4.0. Training is tailored to companies' needs in priority sectors. The first phase trained 28 000 workers, while the second aims to train 200 000 with a budget of EUR 94 million.

Portugal is on a par with the EU average on ICT specialists in employment but has a lower percentage of ICT graduates (2.6% versus 3.9% for the EU) which has stagnated for the last 3 years. The low rates of ICT enrolment and graduates undermine the EU's prospects of reaching the Digital Decade target of 20 million ICT specialists by 2030.

Portugal is rolling out initiatives to address this shortcoming. Component 6 of its RRP is funding the creation of 365 specialised technological centres in public and public/private professional schools over the period 2022-2025, which will improve professional courses in IT, digital, renewable energies and manufacturing / industry 4.0, environmental efficiency and gender equality. However this measure does not cover Azores and Madeira. INCoDe.2030 aims to extend lifelong digital training for 72 000 professionals, train 3 000 unemployed people so they can pursue a career in ICT, and build the digital skills of 320 000 people through the platform *Academia Portugal Digital* by 2023. Portugal's indicators aim to have at least 5% and 7% employed ICT specialists, 25% and 30% of employed female ICT specialists, and 4% and 5% doctoral or equivalent level in ICT graduates by 2025 and 2030, respectively.

One of the goals of INCoDe.2030 is to strengthen the digital skills of civil servants with the aim of training professionals in cyber and information security by 2023. The C-Academy is an advanced training programme under the RRP. In collaboration with academia, it aims to train/retrain 9,800 cybersecurity specialists in businesses and public administration by Q1 2026. Courses will cover i) basic cybersecurity training for employees; ii) training of trainers; iii) training for implementation of controls in the National Cybersecurity Framework; iv) training for computer security response team or security operations centre specialists; and v) cybersecurity training for IT professionals. The target number is based on some 1 000 national entities e.g. operators of essential services, critical infrastructures operators and main public administration bodies with an estimate of 10 cybersecurity experts per entity (number of experts needed to perform cybersecurity tasks and processes in order to achieve high maturity in those type of entities).

The UPSKILL programme partners with IEFP, CCISP, ISCTE, Algarve University and APDC to offer intensive specialised training in the digital area to 3 000 people so they can become ICT professionals by 2023.

Portugal's 18 sector councils for qualifications update qualification standards and vocational education and training (VET). They run as collaborative platforms gathering VET and labour representatives to design qualifications. No qualification is integrated in the National Catalogue of Qualifications without consulting the respective sector council, the one which focuses on electronics,

computers and telecommunications. Portugal's System for the Anticipation of Qualification Needs (SANQ) plays a vital role in managing skills development strategies. Its goal is to increase the quality of information for young people, job seekers, employers, teachers, trainers and policymakers when making decisions on skills investment. SANQ gathers data from skills anticipation exercises to inform policymaking on skills and plans the provision of education and training in the public and private sectors. A multistakeholder approach involving local communities, VET providers and employers determines SANQ's relevance.

Addressing the demand for digitally skilled workers in the business sector, Portugal introduced the Academia Portugal Digital platform (2022) to encourage people to learn digital skills and seek career opportunities via online courses. It is part of INCODE.2030 and is funded by RRP investment under Component 16. It runs until 2026.

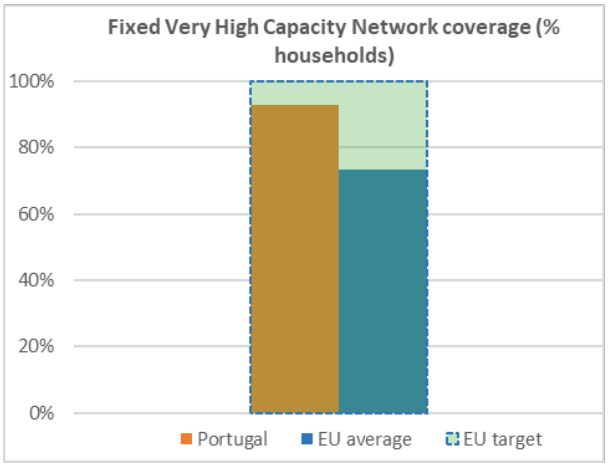
Best practice: The UPSKILL programme
With rising demand for ICT talent in Portugal, unemployed professionals and employed people in jobs below their capabilities have the potential to pursue careers in ICT through reskilling/upskilling. UPSKILL is a requalification programme aiming to train 3 000 people by 2023 with a budget of EUR 25 million. As the low percentage of ICT graduates is perceived to be a national problem, UPSKILL was included in the action plan for the digital transition. It is a collaboration between the IEFP - Institute of Employment and Professional Training, ICT companies and higher education institutions (HEI), the latter two setting out the training needs and offer. The IEFP recruits the candidates, pays for their training and ensures that the HEIs receive funding. It offers 6 months theoretical training and 3 months of work practice. Trainees receive a monthly scholarship equal to the minimum wage. An innovative feature is ensuring that at least 80% of the trainees who complete the course are hired with a gross salary of at least EUR 1 200. Currently, 70 companies take part in the programme which entered its third stage in October 2022.

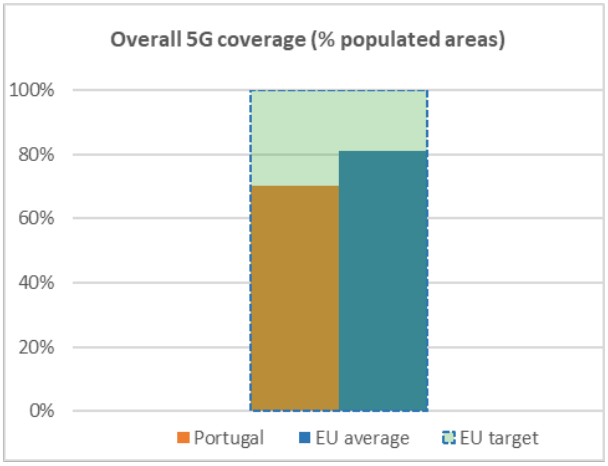
Portugal should accelerate its efforts in the area of digital skills. *In particular, Portugal should accelerate the implementation of its digital skills programmes and reach a critical mass of people across all demographics. Portugal should encourage private sector investment in digital skills training 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*[2]*.*

[2] The recommended policies, measures, and actions in this document reflect the Commission Communication 'Report on the state of the Digital Decade' COM(2023) 570.

2 Digital infrastructures

	Portugal			EU	EU
	DESI 2021	DESI 2022	DESI 2023	DESI 2023	2030 target
2a1 At least 100 Mbps broadband take-up	**67%**	**73%**	**77%**	**55%**	
% households	2020	2021	2022	2022	
2a2 At least 1 Gbps broadband take-up	**1.4%**	**2.0%**	**4.5%**	**13.8%**	
% households	2020	2021	2022	2022	
2a3 Fixed Very High Capacity Network (VHCN) coverage	**87%**	**91%**	**93%**	**73%**	**100%**
% households	2020	2021	2022	2022	
2a4 Fibre to the Premises (FTTP) coverage	**82%**	**88%**	**91%**	**56%**	
% households	2020	2021	2022	2022	
2b1 Mobile broadband take-up	**72%**	**82%**	**82%**	**87%**	
% individuals	2018	2021	2021	2021	
2b2 Overall 5G coverage	**0%**	**0%**	**70%**	**81%**	**100%**
% populated areas	2020	2021	2022	2022	
2b3 5G spectrum	**8%**	**61%**	**61%**	**68%**	
Assigned spectrum as a % of total harmonised 5G spectrum	2021	2022	2023	2023	





The successful coexistence of public and private investment, and the national regulatory authority's efforts to improve market competition mark Portugal's considerable progress on fixed very high capacity network (VHCN) and fibre to the premises (FTTP) coverage over the last few years, especially its ability to close the gap between urban and less populated areas.

Portugal is expected to make a positive contribution to the achievement of the Digital Decade goals for digital infrastructures. Portugal performs particularly well on fixed VHCN and FTTP coverage (93% and 91% respectively compared to the EU average of 73% and 56%) as well as 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. On overall 5G coverage (70%) the country scores below the EU average (81%).

Portugal is currently implementing several measures that can help **increase the level of Gigabit and 5G network deployment**. In August 2022, Portugal adopted the law on electronic communications (Law 16/2022 of 16 August) that transposes Directive (EU) 2018/1972 of the European Electronic Communications Code (EECC). This law updates Portugal's regulatory framework in the field with the aim of facilitating investments into the country's very high capacity network. In parallel, Portugal's national strategy for the decade and its strategic framework on national and EU funding under Resolution of the Council of Ministers No. 98/2020 sets out the country's plans on deploying VHCN to households as well as to industrial, commercial and agricultural premises by 2030. In this context, a call for tenders on deployment, operations and maintenance of fixed VHCN in "white areas" will be launched by the end of Q2 2023.

Regarding 5G, in 2021, Portugal assigned two of the 5G pioneer bands i.e. the 700 MHz and 3.6 GHz bands as part of a multi-band auction that concluded in October of the that year. The "5G Auction Regulation" on allocating rights to use these frequency bands set out significant coverage obligations to incumbent operators, acquiring rights of use in the 700 MHz band. These include coverage for 95% of the population, 90% of the population in low density areas and in each parish of autonomous regions (Madeira and Azores). For new entrants the coverage obligations in Portugal by 2025 of certain road and rail infrastructures are only limited to 25% of highways, main railways and national roads. This Regulation also established network development obligations associated with the 3.6 GHz band. Those concern the installation of base stations in low-density municipalities and in those with over 50 000 inhabitants. New entrants acquiring any frequency in the auction are entitled to national roaming access for at least 10 years in the geographic areas where they would not have mobile coverage using the frequencies assigned to it (subject to coverage and time conditions). Portugal has launched two public consultations on the 26 GHz band so far (in 2018 together with other 5G bands, and in 2022), and the band has yet to be auctioned. On take-up, since late 2021, Portuguese mobile network operators have been offering their mobile subscribers free access to the 5G services. In 2022, Portugal's national regulator *Autoridade Nacional de Comunicações* (ANACOM) reviewed some prices for access to: i) circuits connecting the mainland and the autonomous regions of the Azores and Madeira (CAM circuits) as well as prices of circuits linking some islands in the Azores (inter-island circuits) over submarine cables owned by the operator with significant market power (SMP) MEO; and ii) ducts and poles i.e. Reference Duct Access Offer (RDAO) and the Reference Poles Access Offer (RPAO), laying down a monthly-fee reduction of around 35% and 20% respectively in particular to MEO's infrastructures. In July 2022, ANACOM introduced further amendments to MEO's RDAO and RPAO.

In 2021, Portugal also approved Decree-Law 66/2021 that sets out a social tariff for broadband internet access services. That allows low-income consumers or people with special social needs to access broadband internet services (fixed or mobile, with 15Gb of data) at a lower price.

In November 2022, the national competition authority (Autoridade da Concorrência) was notified of a telecom operator's acquisition of another operator that controls a mobile virtual network and had acquired spectrum reserved for new entrants in the 3.6 GHz band. The national competition authority is still evaluating the merger.

Regarding the semiconductors target, 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).

With respect to the quantum target, Advanced Computing Portugal (ACP.2030) is a science and innovation strategy aligned with INCoDe.2030 and AI Portugal 2030, which aims to expand Portugal's supercomputing infrastructure by 2030. Activities include creating a supercomputing infrastructure for R&I, provide experts with advanced computing skills, and implement a public policy info-

structure. A milestone in this area was the inauguration of the Minho Advanced Computing Centre (MACC) in 2019, home to Portugal's first supercomputer, BOB. This machine is part of the Iberian Advanced Computing Network and marks Portugal's participation in the European High-Performance Computing initiative (EuroHPC). Deucalion, Portugal's second EuroHPC supercomputer will also be installed at MACC. The national HPC network and the DIH network will be introducing new cloud-to-edge market offers and promoting cloud computing.

Portugal leads DISCRETION, a multi-country project with Austria, Italy, and Spain using software-defined networks and quantum key distribution to address emerging threats and strengthen European defence in secure communication and military activities that rely on radio spectrum. Portugal is committed to the Euro QCI project, and is setting up a national ultra-secure quantum communications technology infrastructure covering mainland regions, Azores and Madeira, thereby expanding the EU network. The project brings the EU closer to its Digital Decade target of having its first computer with quantum acceleration and being at the forefront of quantum capabilities by 2030.

Portugal is well on track towards achieving the Digital Decade connectivity targets for 2030 and is expected to make a positive contribution to the collective efforts to achieve the Digital Decade targets on connectivity, especially in terms of VHCN by closing the gap between urban and less populated areas. However, the country is lagging on 5G coverage, mainly due to some delay in auctioning the 700 MHz and 3.6 GHz bands, and there is no estimated date for the auctioning of the 26 GHz band.

Best practice: replacement of the submarine cable system
The replacement of the submarine cable system connecting mainland Portugal, Azores and Madeira (CAM Ring) and the inclusion of the SMART (Science Monitoring and Reliable Telecommunications) component was decided by a Council of Ministers Resolution in November 2022. The CAM Ring will be among the first underwater electronic communication cable with SMART component. It involves placing sensors along the cable so underwater electronic communication systems will no longer be used exclusively for that purpose, making it possible to monitor environmental indicators (water temperature, level, salinity, etc.) and measure seismic activity. The specifications were developed by the LEA Consortium ('Listening to the Earth under the Atlantic') which included the Telecommunications Institute, Portuguese Institute of Sea and Atmosphere and Institute D. Luiz of FCUL. Recently, the LEA published "'Description and implementation of the '"Observer Part' of a SMART Cable' to support the analysis and ordering of SMART Cable. Internationally, the Joint Task Force on SMART cables has been developing the SMART concept supported by UN agencies, the International Telecommunication Union, the World Meteorological Organization and the Intergovernamental Oceanographic Commission of UNESCO (IOC-UNESCO).

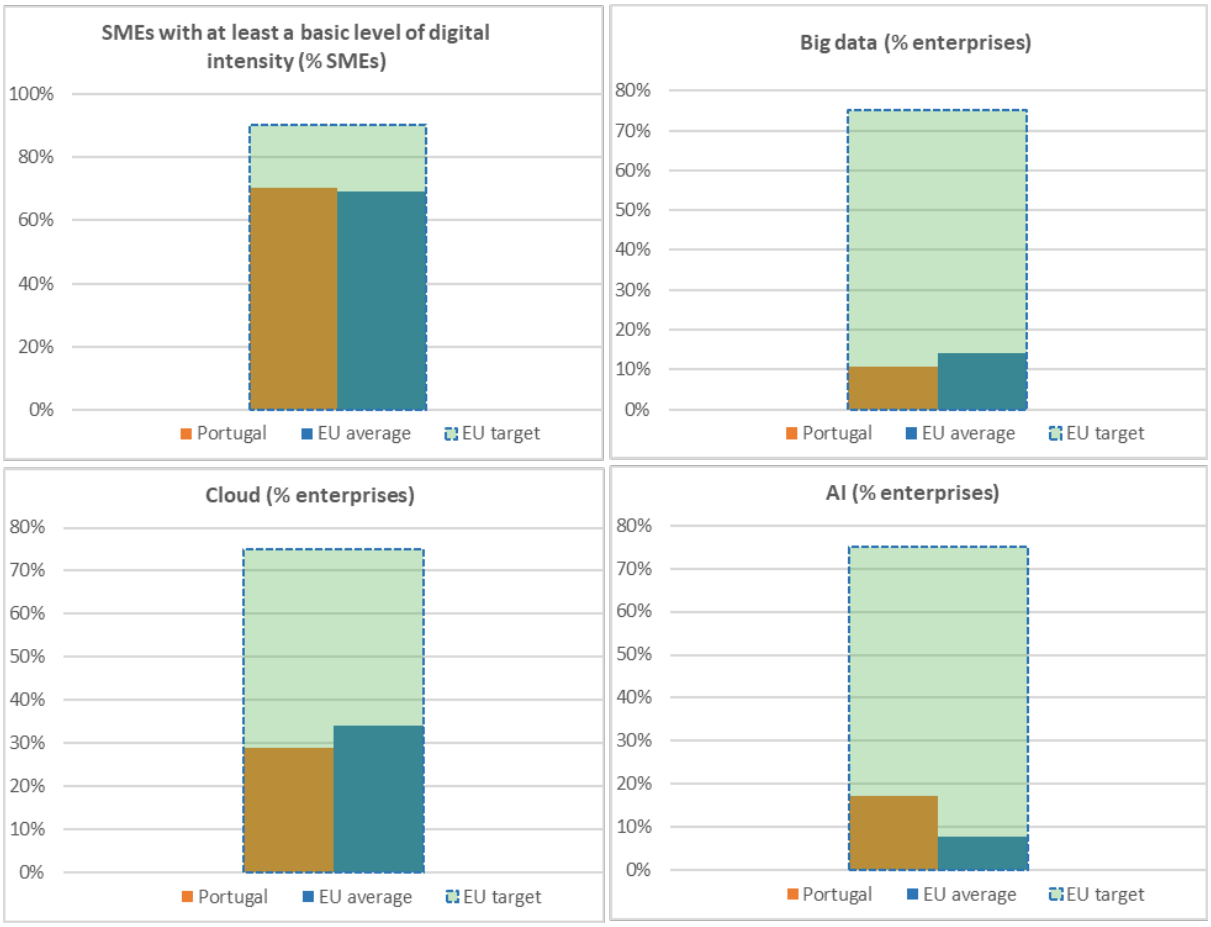
***Portugal should continue its efforts on connectivity infrastructure**, accelerating those supporting 5G coverage. In particular, Portugal should implement measures to grant access to network infrastructure, further simplify processes and harmonise local regulations to accelerate the deployment of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

3 Digitalisation of businesses

	Portugal			EU	EU
	DESI 2021	DESI 2022	DESI 2023	DESI 2023	2030 target
3a1 SMEs with at least a basic level of digital intensity % SMEs	**NA**	**NA**	**70%** 2022	**69%** 2022	**90%**
3b1 Electronic information sharing % enterprises	**42%** 2019	**52%** 2021	**52%** 2021	**38%** 2021	
3b2 Social media % enterprises	**16%** 2019	**26%** 2021	**26%** 2021	**29%** 2021	
3b3 Big data % enterprises	**11%** 2020	**11%** 2020	**11%** 2020	**14%** 2020	**75%**
3b4 Cloud[3] % enterprises	**NA**	**29%** 2021	**29%** 2021	**34%** 2021	**75%**
3b5 AI % enterprises	**NA**	**17%** 2021	**17%** 2021	**8%** 2021	**75%**
3b6 e-Invoices % enterprises	**17%** 2020	**17%** 2020	**17%** 2020	**32%** 2020	
3c1 SMEs selling online % SMEs	**19%** 2020	**16%** 2021	**18%** 2022	**19%** 2022	
3c2 e-Commerce turnover % SME turnover	**16%** 2020	**13%** 2021	**13%** 2022	**11%** 2022	
3c3 Selling online cross-border % SMEs	**8%** 2019	**8%** 2021	**8%** 2021	**9%** 2021	

[3] Enterprises buying sophisticated or intermediate cloud computing services indicator, see Digital Economy and Society Index (DESI) 2023 Methodological Note.



Overall, Portugal is expected to make a positive contribution to the Digital Decade targets linked to the digitalisation of business. 70% of its SMEs have at least a basic level of digital intensity, surpassing the EU average of 69%. Enterprises using cloud and big data stand at 11% and 29% respectively, trailing the EU average of 14% and 34%. However, Portuguese businesses using AI account for 17%, more than twice the EU average.

Investing in knowledge-based capital and ICT equipment could encourage Portuguese SMEs to adopt digital technologies. SMEs dominate Portugal's business economy. They are concentrated in traditional sectors, most with fewer than 10 employees. Recent economic growth has improved SME activity and investment levels, but productivity remains a challenge in traditional sectors. Public support for SMEs includes financial instruments, tax incentives and qualification programmes to boost the skills of the workforce. Funding for digitalisation projects is limited for SMEs that lack sufficient collateral or own funds. Portugal has prioritised digitalisation with public initiatives and post-pandemic economic stimulus packages. Business associations and clusters promote digitalisation, good practice, and connect buyers and with sellers, while training and advising SMEs. A modest, yet growing start-up ecosystem has been encouraged through events like Web Summit and incubators, as well as venture capital financing with substantial public support. Currently Portugal counts only one unicorn, towards the Digital Decade target of doubling the number of unicorns.

The government's initiatives and financial tools to support SMEs across sectors include equity, debt and guarantees by public agencies, tax incentives (Sistema de Incentivos Fiscais à I&D Empresarial - SIFIDE) and qualification training by the Instituto do Emprego e Formação Profissional and the Agência para a Competitividade e Inovação. Portugal's RRP launched Indústria 4.0 – a comprehensive plan for digitalisation and innovation for the next 4 years.

Public programmes and funding have contributed to Portugal's digitalisation, but the landscape of resources can be complex to navigate. Different entities manage many programmes, addressing Indústria 4.0 objectives directly or indirectly. The main public agencies - SPGM, PME Investimentos, IFD and Portugal Ventures - also channel funding for innovation and digitalisation projects. Providers of digital solutions are fragmented across digital/start-up SMEs and competence/R&D centres associated with clusters and larger companies. These diverse resources and structures make it challenging for businesses to gain access to resources for digitalisation.

The Digital Commerce Districts programme aims to provide 50 districts with local digital infrastructure, targeting small businesses with a budget of EUR 52.5 million. Within its RRP, Portugal is implementing measures to boost enterprises' digital intensity: the testbeds national network, Digital Innovation Hubs (DIHs), a digital transition services catalogue, a digital maturity assessment tool and seal, proximity accelerators, vouchers for accelerators, internationalisation of commercial businesses, etc. The RRP allocates funds for companies to set up test beds under the national network initiative in order to experiment with innovative products and services through the infrastructure of entities that have capability in 5G, AI, big data and blockchain.

The DIH national network promotes digital transformation for companies and the public sector, with 16 of the 17 DIHs part of the European network. The DIH measure will fund 4 000 SMEs from the RRP. Based on sectoral and geographical coverage, its technological scope aligns with EU priorities in AI, high-performance computing (HPC), cybersecurity, cloud, big data and analytics. The goals include knowledge transfer, strengthening technological capacity, the entrepreneurial ecosystem and new technologies with the Free Zones for technology and the national test beds network. The DIH network could also be a vehicle for adoption of digital maturity seals in the field of cybersecurity, privacy, data protection and accessibility. Funded by the RRP, the programme is run by the Portuguese Institute of Accreditation, the Institute of Quality and the Imprensa Nacional Casa da Moeda, and is monitored by the Portugal Digital Mission Structure. The initiative aims to issue 15 000 seals by 2025 with a budget of EUR 30 million. The Portugal Digital Mission Structure launched the digital maturity assessment tool for companies to self-assess their strategy and innovation, cybersecurity, information management and operations. The online catalogue for digital transition services allows enterprises to access service packages, and service providers can gain accreditation. The platform implements measures from the RRP's Component 16, including support for enterprises to increase their digital maturity with programmes like Digital Commerce Accelerators, Coaching 4.0 and certification seals.

Under the RRP, the e-commerce internationalisation measure supports SMEs that are new exporters in training and consulting through a programme for market diversification and international exposure through digital channels. Its total budget is EUR 25 million.

Vouchers for incubators/accelerators aim to support start-ups less than 10 years old and SMEs certified by the Instituto de Apoio às Pequenas e Médias Empresas e à Inovação (IAPMEI) looking to develop digital business models through open data or AI, and highly qualified human resources, R&D, incubation, acceleration or consulting. Commercial micro-enterprises and SMEs will receive support for their digital transition from 25 proximity accelerators. Financial incentives for digital business models are part of the initiative funded through the RRP, with a total allocation of EUR 20 million and a voucher per accelerator/incubator worth between EUR 30 000 and EUR 150 000. In parallel, the Start-up Vouchers programme, also funded by the RRP with EUR 90 million, will give out a maximum of EUR 30 000 per start-up that deploys digital and green innovative solutions.

To promote entrepreneurship, a bill that entered into force in May 2023 establishes a competitive regime for start-ups, scale-ups and disruptive tech companies through a legal framework of tax

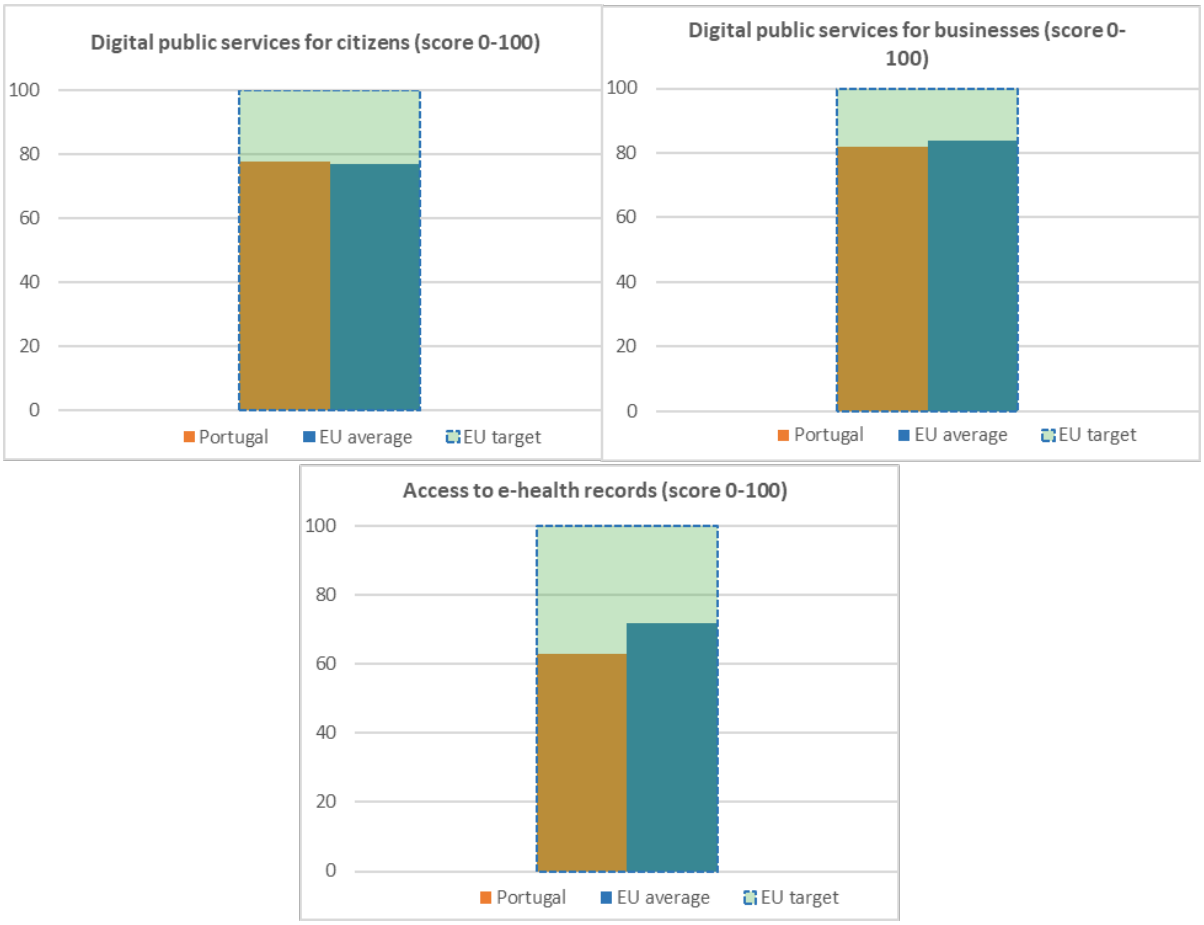
benefits and incentives. Start-up Portugal will lead the entrepreneurship agenda and roll out actions to support the ecosystem as part of the RRP.

Best practice: Portugal's national Test Beds Network
The Test Beds Network of 30 test beds plans to develop of 2 711 pilot products by the end of 2025. It has a budget of EUR 150 million funded by RRP. Test beds are infrastructures where SMEs and start-ups test new products and services in a physical space with a strong digital element or a virtual simulator. They aim to increase the number of commercial products, shortening their innovation cycle and helping them cross the 'valley of death'. The measure is aligned with the European Testing and Experimentation Facilities co-financed by the Digital Europe Programme, complementing other measures like DIHs and the Technological Free Zones. Portuguese enterprises and its public administration will be able to access advanced digital competencies, specialised training, advice on funding for digital transition, as well as collaborate with SMEs, larger companies and entities in the R&I system.

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.*

4 Digitalisation of public services

	Portugal			EU	EU
	DESI 2021	DESI 2022	DESI 2023	DESI 2023	2030 target
4a1 e-Government users % internet users	**NA**	**NA**	**81%** 2022	**74%** 2022	
4a2 Digital public services for citizens Score (0 to 100)	**NA**	**79** 2021	**78** 2022	**77** 2022	**100**
4a3 Digital public services for businesses Score (0 to 100)	**NA**	**82** 2021	**82** 2022	**84** 2022	**100**
4a4 Pre-filled forms Score (0 to 100)	**NA**	**76** 2021	**81** 2022	**68** 2022	
4a5 Transparency of service delivery, design and personal data Score (0 to 100)	**NA**	**70** 2021	**71** 2022	**65** 2022	
4a6 User support Score (0 to 100)	**NA**	**88** 2021	**88** 2022	**84** 2022	
4a7 Mobile friendliness Score (0 to 100)	**NA**	**88** 2021	**90** 2022	**93** 2022	
4b1 Access to e-health records Score (0 to 100)	**NA**	**NA**	**63** 2022	**72** 2022	**100**



Portugal is expected to make a positive contribution to the collective efforts to achieve the Digital Decade goals for the digitalisation of public services.. Online services for individuals account for 78%, while those for businesses are 82% against **the Digital Decade target of providing key public services that are 100% online**. In Portugal, e-government users make up 81% of the population. The country has made digitalising public services a centrepiece of its administrative modernisation by reducing the administrative burden and using ICT to deliver better public service. A politically-empowered governance structure and a central digital modernisation agency with strong implementation capabilities has yielded profound transformations in public administration operations and service design sustained across governments and time. Portugal has pioneered people-driven digital solutions, redesigning service delivery rather than digitising outdated processes, tailoring services to people's lives and realities and reducing bureaucracy. The e-Portugal platform (2019) organises services around life events, not the structure of the public administration.

Portugal's investment in digital infrastructure focused on cross-government digital enablers such as digital identity and interoperability platforms. Strategic initiatives like the SIMPLEX programme for administrative simplification (2006), with 21 measures in 2022, have maintained it's the country's progress. The Digital Transition Action Plan[4] has simplified procedures for critical public services in health and justice. In parallel, the national strategy for the digital transformation of public administration extends the scope of the Interoperability Platform of the public sector (iAP) through seamless services and the once-only principle, implementing document interoperability across the

[4] Official Gazette publication on 21.04.2020

public sector, and integrating base registries into iAP. Four enablers have been critical in reaching the strategy goals: i) common technical, government-wide solutions i.e. digital identity, the mobile key and the interoperability platform as the foundations of digital services; ii) supporting strategies i.e. the Open Government strategy, the National Cyberspace Security strategy and sectoral strategies in the judicial and health sectors; iii) integrating new technologies such as AI, big data and data analytics into the public administration; and iv) developing human capital.

Flagship initiatives include: i) the Citizen Card – the national ID card entailing both physical and digital documents; ii) the Digital Mobile Key (DMK) - an authentication mechanism using a mobile phone; iii) Zero Licensing – a service simplifying the process for issuing certain business licenses; iv) medical e-prescriptions enabling digitised medical prescriptions; v) e-Portugal – a digital single access point for all public services; vi) the Citizen Shops, the Citizen Spots and the Business Spots for face-to-face public services; vii) interoperability platform providing shared tools for interconnecting systems; viii) the SIMPLEX programme for simplifying public administration following a citizen-driven approach involving participation and service co-creation; ix) LabX – the government laboratory for experimenting with innovation in the public sector: and x) AMA Academy – a programme for civil servants to develop digital skills. Both the Digital Mobile Key and the Citizen Card are eIDAS-compliant with a 'high' level of assurance.

Portugal is positively contributing and moving steadily towards the Digital Decade target of 100% of EU citizens having access to secure means of electronic identification (eID) that are recognised throughout the EU, enabling them to have full control over identity transactions and shared personal data. Making eID a priority has yielded positive outcomes such as Portugal's implementation of digital identification mechanisms and their adoption by the public, businesses and the public administration. The strategy for the digital transformation of public administration for 2021-2026 aims to increase the public services that require authentication through the national eID system. This goal is part of the national RRP, which guarantees sufficient funding. It brings together all national electronic authentication and signature solutions with a common Application Programming Interface for service providers, enabling secure identification on both public and private sector portals and applications. Since January 2023, users can activate the DMK using video calling and biometrics. In addition, users with an active DMK can use biometrics on their mobile devices to sign documents and authenticate themselves in over 300+ public and private websites integrated with the DMK. ID.gov.pt is the official app for accessing and sharing digital versions of personal ID documents.

Yet, while the eID Citizen Card is mandatory, it can be challenging to use for some, particularly older people, people with disablilities or people living in remote areas.

Initiatives are underway to streamline processes and provide more convenience targeting different end-users. These have added new features like mobile eSignatures, which have been swiftly integrated into digital public services by government sectors, and adopted by the private sector, including banking and utilities. Other actions include centralising energy purchases for the public administration in a secure, dematerialised way, and automating the Firms and Denominations Exchange. Professionals can register authentic acts and authenticate private documents and remote recognitions through a dedicated platform. Primary healthcare units have expanded their capabilities with interactive voice response, allowing faster, more efficient interaction.

Portugal and 20 other countries are members of the POTENTIAL European consortium funded by the Digital Europe programme to test the European digital identity wallets, which are to be launched in conjunction with the revision of the eIDAS Regulation. Running from June 2023 to May 2025, the project has a budget of EUR 62 million, EUR 17 million of which is EU co-funding. It will pilot cases like online authentication, opening online bank accounts, ePrescriptions, mobile driving licences, eSignatures and SIM registration.

The tax authority is simplifying online tax-filing and improving the user interface of the tax portal. The country has also been modernising its public procurement through mandatory e-invoicing since 2020. The private sector is encouraged to adopt e-invoicing voluntarily. Paperless invoicing is becoming common as people can receive digital invoices for purchases in supermarkets, pharmacies, restaurants, etc. that use adherent billing systems. Funded by the RRP[5], the Paperless Invoices Platform (December 2022) aims to reach 250 000 users and issue 700 million electronic invoices by the end of 2025.

The Plataforma de Atendimento à Distância (Remote Service Platform) of April 2022[6] provided by the Ministry of Justice, allows people to carry out formal acts online such as real estate purchases and mutual consent divorce without having to meet in-person. These acts carry the same legal weight as in-person acts. Pension requests can be made online with related activities being fully dematerialised. Justice LAB is an innovation and education programme (2022) for civil servants in justice bodies to provide efficient, people-centred services. The online Justice Practical Guide Tool (2023) provides simple access to justice-related information, drawing on data from public administration portals. The Justice Govtech Strategy (2023) brings justice organisations closer to the entrepreneurship ecosystem. It aims to expedite the sector's digital transformation and create a culture of innovation addressing issues such as authentication, new business models, automation and data exploration. The Portuguese RRP[7] also aims to transform social security services through digitalisation using cloud-based IT infrastructure. The plan includes the implementation of an innovative omnichannel model integrating public, business and social security service interactions into the cloud.

Portugal's public health services have untapped digital potential and aim to ensure 100% of people can access their electronic health records in line with the Digital Decade goal. Ranking 21st in the EU for online access to electronic health records (scoring 63 against EU average of 72), Portugal's Serviço Nacional de Saúde 24 – SNS 24 allows 80-100% of people in Portugal to access their health records via web, app, telephone and physical counters using eID authentication. It provides electronic patient data, ePrescription and eDispensation information, but not test results and reports e.g. laboratory tests, medical images, and hospital discharge reports. It only collects data from public healthcare providers, not private ones or public rehabilitation centres, geriatric nursing homes and mental health facilities. Portugal's efforts in expanding online accessibility to public health services align with the Digital Decade target. To support this goal, Portugal participates in several multi-country projects for electronic health record services, which aim to establish a common framework for medical imaging, lab results, hospital reports and cross-border ePrescription/eDispensation. They work to improve the exchange of health information between Member States and develop a mobile app for Europeans to access their patient summary through MyHealth@EU in different languages.

Portugal is well positioned to make a positive contribution to achieve the Digital Decade targets on the digitalisation of public services. Its digital journey shows that modernising the government requires transforming government practices, reimagining the relationship between the public and public institutions. Implementing robust data protection and cybersecurity measures to safeguard sensitive information collected from people is essential to boost take-up. Clear guidelines for using

[5] C16-i03: Catalysing the digital transition of enterprises for EUR 10 million
[6] Decree-Law No 126/2021
[7] TD-C17-i03

digital public services, and ensuring that people know how their data are used will strengthen trust in the system.

Best practice: MOSAICO

MOSAICO is a common model for designing and developing digital public services. It comprises essential principles for the evolution of public services, promoting coherence and consistency in people's and businesses' relationship with the state. The dedicated webportal provides information and documentation of technical architectures of the public administration platforms e.g. digital identity (authentication, signature, certification of attributes), open data portal, interoperability platform, catalogue of entities and services, electronic notifications system, ePortugal (single digital gateway for public services).

***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.*