

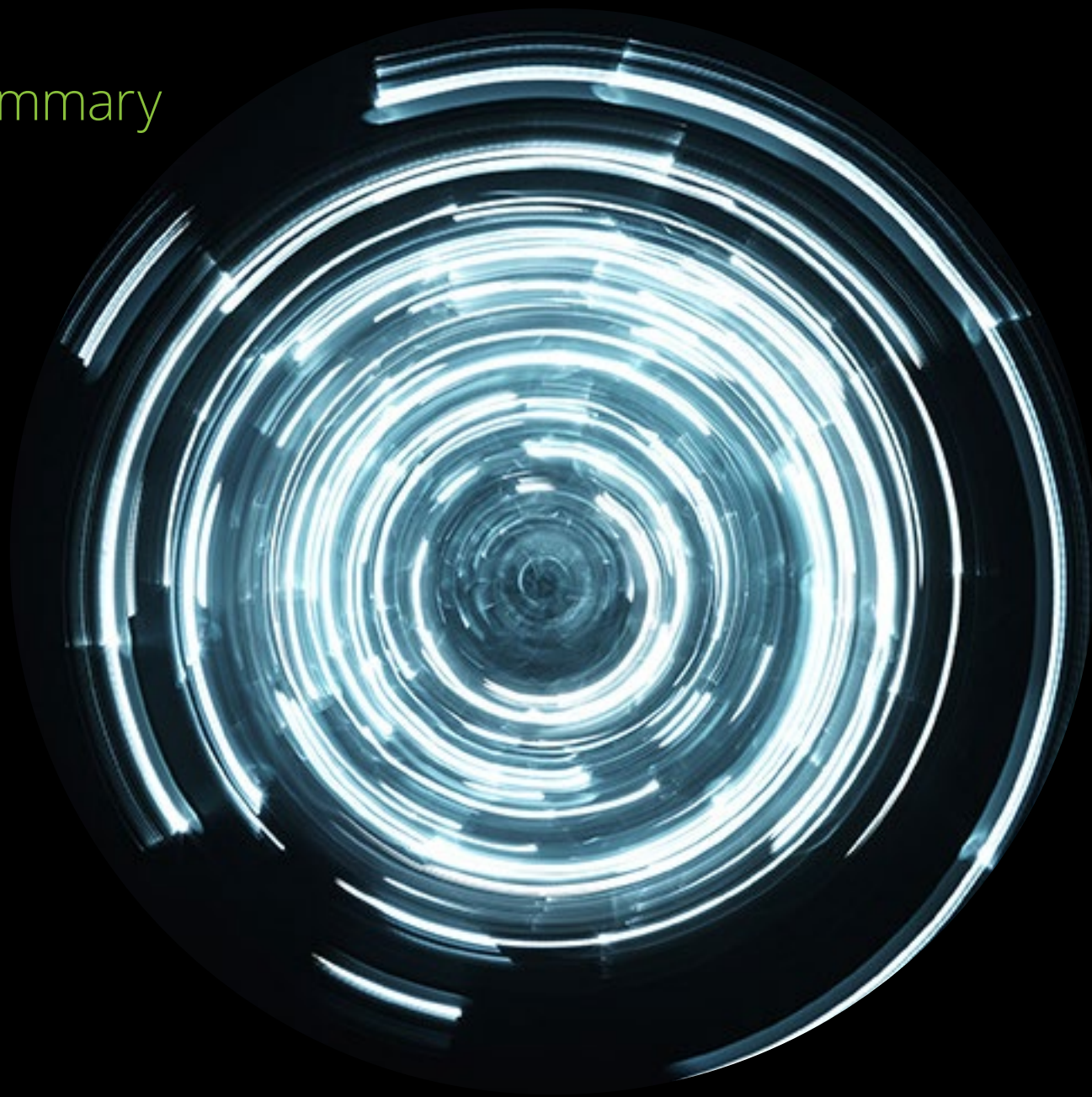
The contribution of National Recovery and Resilience Plans to achieving Europe's Digital Decade ambition

Deloitte LLP Report - 21 June 2021

Contents

Executive summary	4
Context and objectives of the study	11
The approach	17
Overview of Member States	21
Member State Deepdives	35
Czechia	38
France	43
Germany	48
Greece	53
Hungary	58
Italy	63
Poland	68
Portugal	73
Romania	78
Spain	83
Conclusion and next steps	88
NRRPs reviewed and sources	90
Glossary and references	92

Executive summary



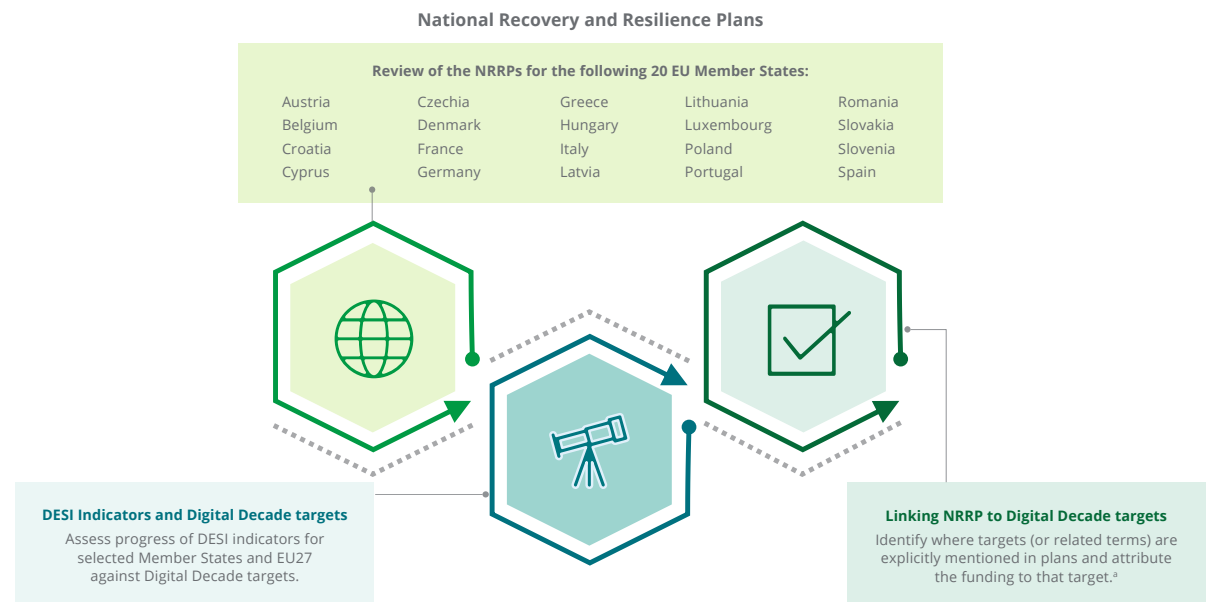
Objectives and approach

The aim of this study is to provide a high-level analysis on the potential contribution of National Recovery and Resilience Plans towards the Digital Decade targets, covering 20 Member States

Objective of the study

- The European Commission (the 'Commission') will be conducting detailed assessments of EU member state National Recovery and Resilience Plans ('NRRPs' or 'plans').
- This study provides a high-level qualitative financial analysis of how:
 - the NRRPs of 20 Member States collectively have been linked towards achieving the Digital Decade targets^a; and
 - a selection these Member States (10), as well as the EU27 as a whole, are progressing towards these targets and the potential gap to achieve these targets.
- This study does not seek to replicate the Commission's assessment or express views on the adequacy or otherwise of particular plans.
- The study by and large did not take into account other non-RRF related national plans that may contribute to digitalisation and the targets.

Approach



a) In cases where funding appears to be linked to multiple targets, and where a breakdown has not been identified, the funding is only included once in the total funding amount linked to Digital Decade targets. However, in attributing this funding to specific targets areas, it is assumed that all the funding could be used to achieve the individual target. Therefore, funding linked to individual pillars or areas may represent an upper bound and may not sum to the same amount as the aggregate figures presented in this report.

Overview of the plans of the 20 selected Member States

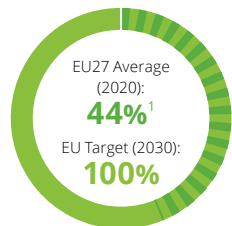
With substantial progress required in order to meet the 2030 Digital Decade targets, the analysis highlights varying degrees of emphasis placed on each of the four pillars (Infrastructure, Skills, Businesses and Public services)

EU 27 progress towards the Digital Decade targets:

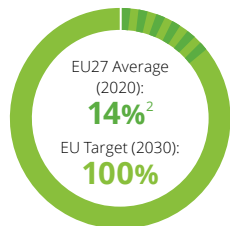
Infrastructure



Gigabit connectivity



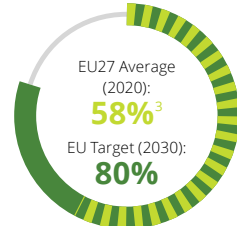
5G coverage



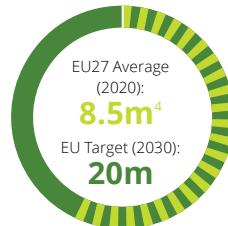
Skills



Adults with basic digital skills



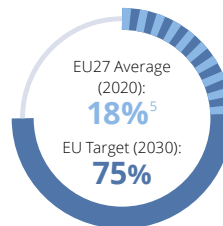
ICT specialists



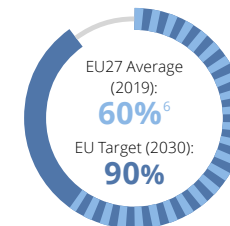
Businesses



Cloud users



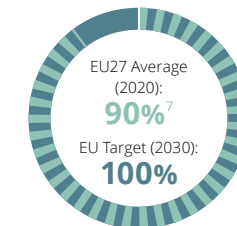
SME basic digital intensity



Public services



Online services



e-medical records



e-IDs



Digital Decade target coverage within NRRPs of the 20 Member State plans analysed:

EU governments have recognised the importance of the Digital Decade targets and set out strategies to achieve those in their NRRPs. However, the level of funding linked to each area and the specificity of the National Recovery and Resilience Plans varies across countries and targets.

The following summarises the number of the Member States NRRPs (of the 20 that were analysed in this study) that have mentioned Digital Decade targets in each of the four areas:

Secure and performant sustainable digital infrastructure



Gigabit connectivity appears in 17 out of 20 NRRPs, with funding linked to the target in 16 of these plans.

5G is mentioned in 16 out of 20 NRRPs with funding linked to the coverage target in 13 of these plans.

A digitally skilled population and highly skilled digital professionals



All 20 Member States provided detailed plans and investments to digitalise the education system, and vocational programmes to increase the digital skill level of adults.

9 out of 20 Member States linked specific funding towards the promotion of ICT specialists.

Digitalisation of businesses



All NRRPs set out initiatives to support businesses, and funding for the digital transformation of SMEs has been linked in 19 out of 20 NRRPs.

Cloud computing strategies are mentioned in 12 out of the 20 NRRPs, with funding committed in 10 of these plans.

Digitalisation of public services



All of the 20 Member States have set out detailed objectives to provide key public services online in their NRRPs. In addition, 19 out of 20 Member States have linked funding to e-health, of which 13 have explicitly linked funding to e-medical records.

Contribution of the NRRPs to the targets (1/3)

Across 20 Member States, 27% of the total NRRP budgets is earmarked to support digital transformation and the majority of this amount can be reconciled to specific Digital Decade target areas

- The **total budget of the 20 Member States' NRRPs amounts to €577bn, of which €485bn is funded by the RRF**, accounting for c.72% of the total RRF budget.
- Of the total budget, around **€154bn (27% of the total) is to support the digital transformation** of the economy and society.
- The analysis in this report has identified up to **€131bn which has been clearly linked to the four key areas of the Digital Decade targets**, accounting for c.85% of the total digital investment^{a, b}.

a) This does not include investment in technologies to support the green transition.

b) Based on Deloitte Analysis of the 20 NRRPs. In cases where funding appears to be linked to multiple pillars or multiple targets, the funding is only included once in the aggregate Digital Decade figure of €131bn. However, in attributing this funding to specific pillars or target areas, it is assumed that all the funding could be used to achieve the individual target. Therefore, funding linked to individual pillars or areas may sum to a higher amount than the total presented.

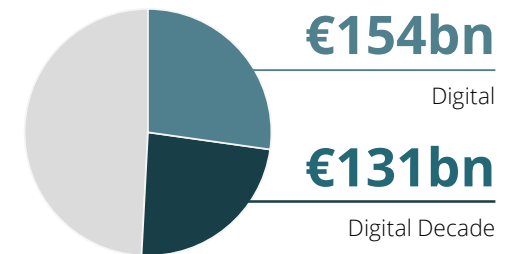
Total RRF budget (EU27)

€ 672.5bn⁸

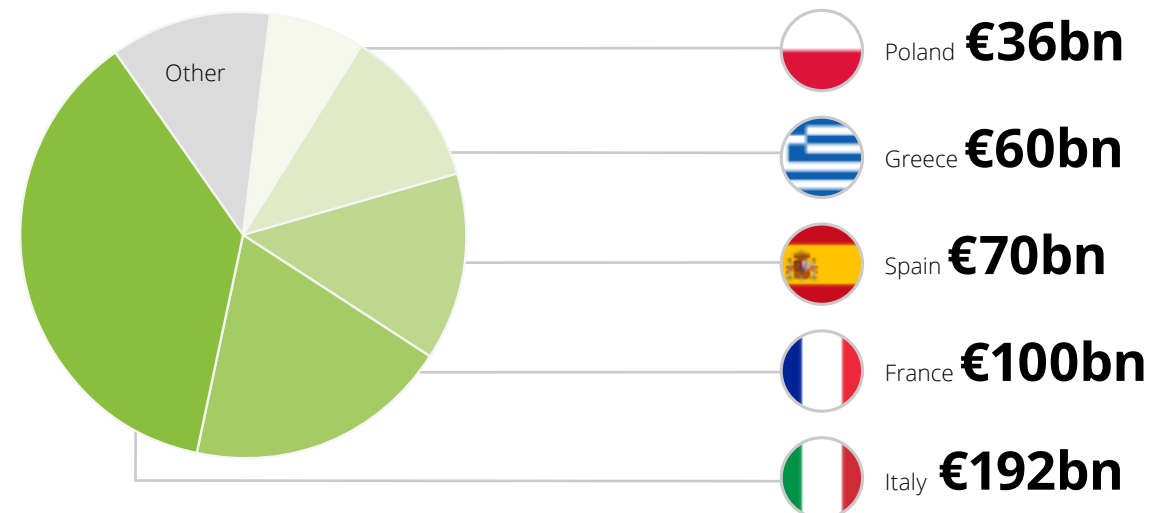
NRRPs Budget (20 Member States)

€ 577bn

of which **€ 485bn** is funded from RRF



Total NRRP Budgets of 20 Member States

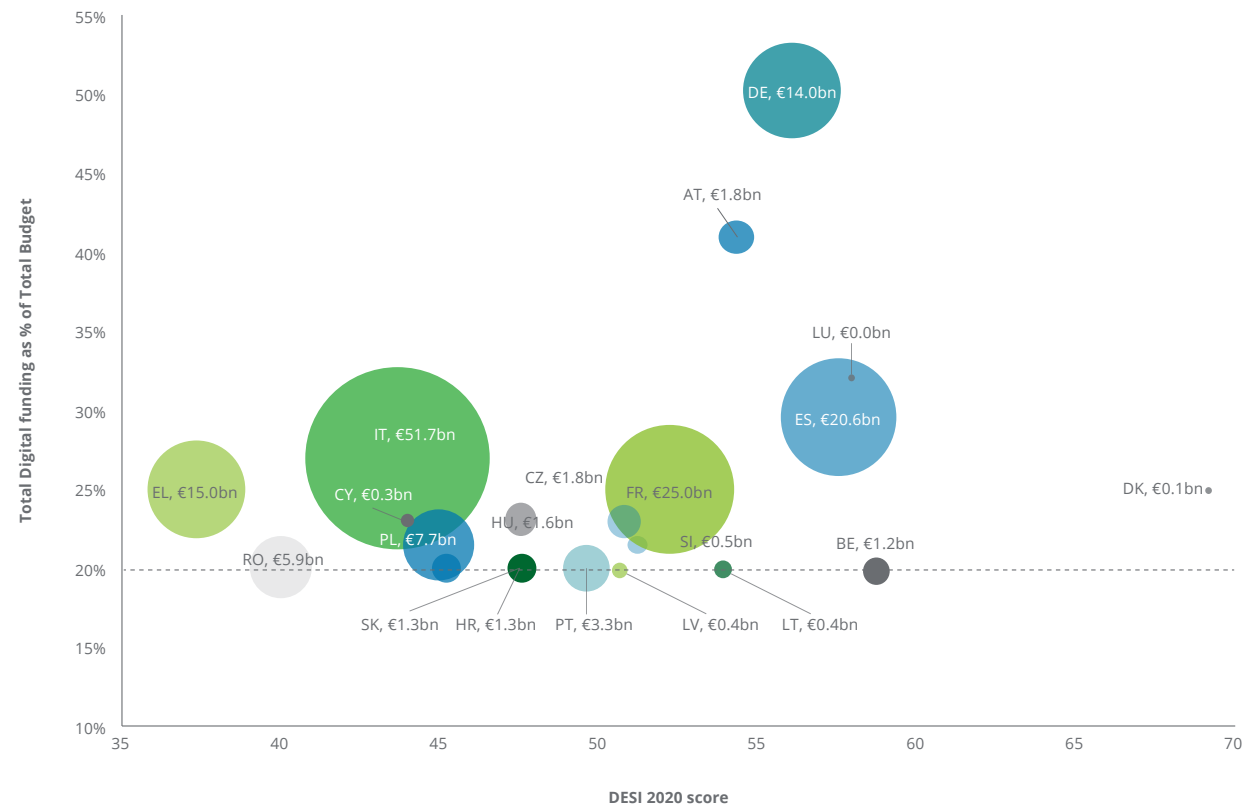


Contribution of the NRRPs to the targets (2/3)

The majority of Member States analysed have linked between 20% and 25% of their total NRRP budget to Digital, which is a common trend across Member States with different current levels of digitalisation

- Member States are required to include a minimum of 20% of expenditure to foster the digital transition.
- The largest contributions to Digital, in absolute terms, are made by countries who have exceeded this minimum threshold.
- However, the majority of countries appear to have positioned Digital expenditure exactly at the minimum 20% threshold, or very close to this.
- For countries with a relatively low current level of digitalisation – as captured by the DESI 2020 score – in particular, it appears uncertain whether the level of investment will be sufficient to close the gap and achieve 2030 Digital Decade targets.
- Equally, it must be recognised that countries with the largest gap to Digital Decade targets may face competing priorities, with other urgent needs in the non-Digital space.
- The contribution of NRRPs to Digital Decade targets does also vary across the four pillars, as set out on the following pages.

Total Digital funding within NRRPs of the 20 Member States



Contribution of the 20 Member State NRRPs to the targets (3/3)

The estimated funding linked to targets in the NRRPs for the 20 Member States could make a material positive contribution to achieving the targets across the four areas; however, based on comparison of funding proposals to investment and spending benchmarks, they may fall still short of addressing funding needed to reach the targets^{a,b}

Whilst the linked funding referenced here reflects just the NRRPs of the 20 Member States, and therefore not the whole contribution of the EU27 to the targets, the 20 NRRPs analysed collectively account for around 72% of the total funding committed (in total, not specifically linked to targets)

a) Additional funding commitments outside of NRRPs specific allocation to Digital Decade targets are not included apart from funding from the National Broadband Plans;

b) The total funding in each category represents an upper bound and the four categories may not add up to the €131bn shown on the previous page, due to double counting of certain packages between categories when a breakdown was not available.

c) Funding committed in the National Broadband Plans include funding from 'ERDF' and 'CEF2 Digital' for some of the countries included in the analysis;

d) Based on estimated from a US study to reskill workers that are projected to be displaced by technology. This may overestimate the cost per worker to gain basic digital skills;

e) This does not include additional funding commitments to support SMEs not specifically related to digitalisation;

f) Eurostat data available on ICT equipment and Computer software / databases for public services has been extrapolated to the EU27 level.



Infrastructure

€18bn

Funding linked to 5G and gigabit networks across the 20 NRRPs. Additional funding of €78bn^c provided by the 20 National Broadband Plans (NBPs). The EIB estimated an EU27 investment gap of [€210bn](#) (excluding expected private sector investment) until 2025.

c.46%

The total funding of the 20 NRRPs and NBPs account for around **€96bn, which amounts to 46% of the €210bn total EU27 investment gap (excluding expected private sector investment) until 2025.**



skills

€47bn

Funding linked to digital skills across the 20 NRRPs equivalent to [7%](#) of the yearly EU public education budgets for digital skills and digital transformation of education. The World Economic Forum estimates that reskilling a worker costs around [€20,300](#).^d

c.4%

Proportion of adults needing reskilling in the EU27 that could be addressed, **equivalent to roughly 2.3m EU workers.**



Businesses

€40bn

Funding linked to support SMEs digitalisation and greater cloud usage across the 20 NRRPs^e. The EIB estimates that European SMEs spend [€57bn-€65bn](#) on digitalisation annually.

c.10%

Funding of the 20 NRRPs equates to around €7bn annually on average until 2026, which amounts to around 10% **of current SME digitalisation spend across the EU27.**



Public services

€30bn

Funding linked to public services, of which funding related to online service availability is around €19bn across the 20 NRRPs and additional funding of around €11bn is linked to e-medical records and e-IDs.

c.6%

Funding of the 20 NRRPs for online services alone equates to around €3bn annually on average until 2026, which amounts to **6% of total EU27 ICT spend for public services.**^f

Key takeaways

Member states are committing significant investment to the digital transformation of their economies; however, further private and public investment may be needed in certain areas to achieve targets in particular Infrastructure, Digital Skills and digitalisation of businesses



Source: Based on Deloitte Analysis of the 20 NRRPs

Funding linked to Digital Decade targets

- The Digital Decade targets are ambitious and will require high levels of improvement in each of the targeted areas over the coming years. If the current trajectory of progress towards the Digital Decade targets continues, by 2030 the EU may not achieve many of the targets that have been set.
- The 20 Member states have committed significant investment of **€154bn towards digital transformation (27% of the total) across the NRRPs**. Of this amount, up to **€131bn appears to be directly linked to achieving the Digital Decade targets**.
- The gap between current levels and target levels of digitalisation varies greatly across Member States. Each country will face different challenges depending on several factors including the structure of the economy, the population density and demography and the geography of the territory. **The majority of NRRPs include Digital funds that amount to 25% or less of the total and it is uncertain whether this will be sufficient for those countries facing the greatest challenges.**

Areas where further investment may be needed

- Based on high-level analysis of the NRRPs, taking into account current trends and challenges, the potential for **a gap between the targets and the levels achieved with proposed investments appears greatest in Infrastructure, Skills (in particular the number of ICT specialists) and Businesses (in particular digitalisation of SMEs) areas**. However there is wide variation between Member States and each will face different challenges in seeking to reach the Digital Decade targets.
- **Digital infrastructure and connectivity** has been recognised as important across the 20 Member States' plans. However, the collective investment across NRRPs and NBP amounts to **46% of the investment gap (excluding estimated private sector investment) that has been estimated by the EIB for digital connectivity** (this share refers to investment of 20 Member states analysed in this report, and does not account for any investment by the remaining seven Member States).
- Further, while the NRRPs across the 20 Member States all provide funding to support SMEs digitalisation, **the aggregate investment amounts to around 10% of current SME digitalisation spend in total across the EU27**. Spain and Italy alone account for around two thirds of the €40bn amount linked to Business area Digital Decade targets.
- The 20 Member States have committed to investment in education, of which up to €47bn is linked to digital skills. However, **9 out of 20 Member States appear to have linked funding to specifically increasing the number of ICT specialists (one of the key targets)**, which accounts for around a tenth of the total investment in digital skills.

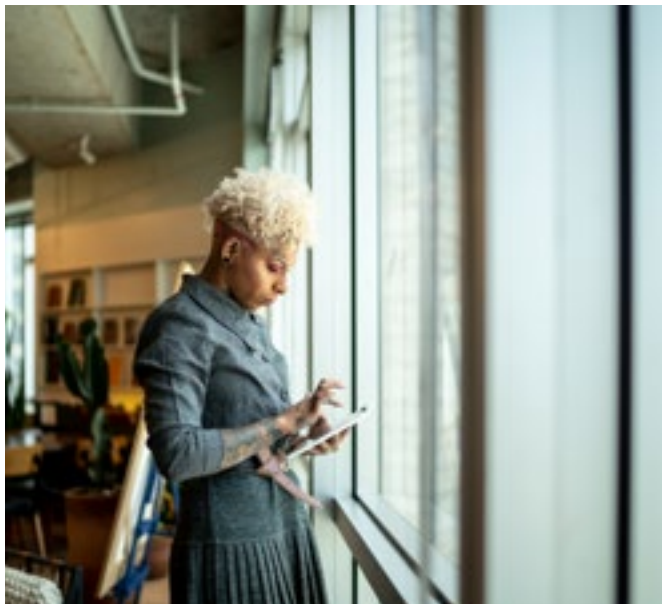
Context and objectives
of the study



The context (1/4)

The European Commission's Recovery and Resilience Facility (RRF) is an ambitious plan to accelerate the twin digital and green transformation of European economies and societies

The recovery from the coronavirus pandemic presents an opportunity to build back better, delivering greater resilience, inclusivity and sustainability for EU Member States and their citizens. For this reason the RRF, part of the NextGenerationEU plan, has been established.



RRF at a glance

Objective

To invest, create jobs and build a green and digital future for all.

Funding

€672.5bn in grants and loans.⁹

Key priorities:

Connect

Rollout of rapid broadband services

Scale-up

Data cloud capacities and sustainable processors

Recharge and refuel

Sustainable transport and charging stations

Power up

Clean technologies and renewables

Renovate

Energy efficiency of buildings

Modernise

Digitalisation of public administration

Reskill and upskill

Education and training to support digital skills

Member State NRRPs

To benefit from the support of the RRF, Member States have submitted NRRPs to the European Commission detailing their proposals for investments and reforms.

- Proposals must earmark at least 20% of investments for digital projects, and 37% for green projects¹⁰
- Reforms and investments should be implemented by 2026

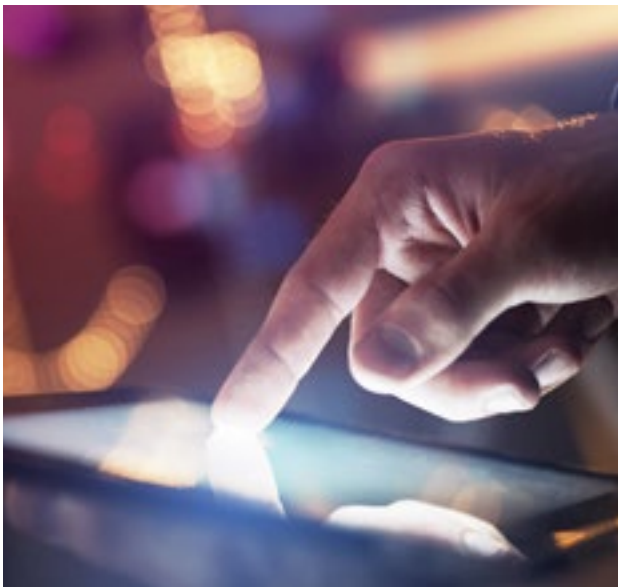
23 Member States have published NRRPs as at 11 June 2021, with 4 Member States still to publish their plans.

The RRF is an opportunity to kickstart the investments needed to achieve the ambitious twin digital and green transitions.

The context (2/4)

The Commission provides guidance on the RRF for Member States on how to allocate at least 20% of the funding for digital projects

The RRF requires Member States to allocate at least 20% of the funding that they will receive until 2026 to digital projects.¹¹ The EC has published guidance on the RFF for Member States¹², where it sets out the following seven categories of investments for Member States to consider when deciding on investment for digital programs.



Connectivity: Measures to bridge the digital divide including between rural and urban areas.



E-government: Modernizing public administration using key digital enablers, e-IDs, mobility of citizens, businesses, goods and services.



Digital-related investment in R&D: ICT R&D, including artificial intelligence, cybersecurity, block chain, quantum computing.



Human capital: Developing digital capacities to support resilient and efficient education, enhancing digital skills and competences.



Greening the digital sector: Policies to reduce waste and energy consumption and usage of renewable energy for digitalisation.



Investment in digital capacities and development of advanced technology: Data spaces, edge computing, high performance computing, cybersecurity.



Digitalisation of businesses: Speeding up decision making and execution with automation based on digital technologies.



The context (3/4)

The Digital Decade targets align with the Commission's digital investment categories and provide a roadmap for Member States to deliver digital transformation through their National Recovery and Resilience Plans

The Commission has set an ambition for a digital transformation by 2030 to empower people and businesses and establish a long-term digital trajectory for the bloc. To deliver this ambition, **the Commission has designed the Digital Compass which sets out the Digital Decade targets across the following four key areas for transformation to be achieved across the EU by 2030.**¹³

The digital investment categories set out by the Commission's RRF guidance on connectivity, human capital, digitalisation of businesses and e-government broadly align with the four areas of the Digital Decade targets. In addition, other categories such as digital-related investment in R&D can act as a catalyst to enable any of the Digital Decade targets. For this reason, the targets provide a clear roadmap to structure the digital investment and reforms set out in Member States' National Recovery and Resilience Plans.

Infrastructure

Infrastructure is a key prerequisite in enabling citizens and businesses to benefit from the digital transformation. **These targets include achieving 100% coverage of fixed gigabit and 5G networks by 2030.** This will require overcoming the challenges in closing the rural divide in connectivity and will enable the greater use of advanced computing technologies.

Skills

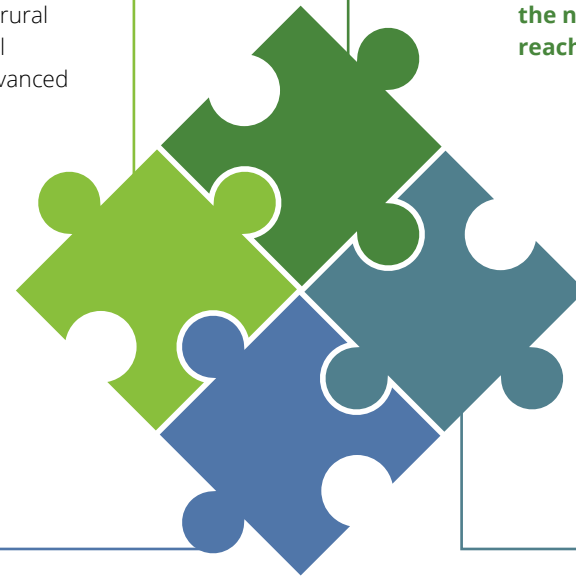
Digital skills are essential in enabling and empowering all individuals to benefit from the digital transformation, increasing trust, inclusivity and equality in accessing services and jobs. **The targets envisage 80% of adults having basic digital skills and the number of EU ICT specialists reaching 20m.**

Public services

The aim of digitising public services is to provide more efficient, inclusive and easy to use systems, enabling cross border access to key services. The digitalisation of public services opens the door to the use of advanced computing for smart cities and e-Health. **By 2030, 100% of public services (e.g. registering a business, family related support etc.) are targeted to be online with 100% availability of e-medical records and 80% of the population using e-IDs.**





Businesses

Supporting businesses to adopt new technologies by reducing barriers (e.g. skills, costs) will be critical in ensuring that EU companies remain globally competitive. **This includes a target for 75% of enterprises to be using cloud, big data and AI by 2030.** Support for SMEs is crucial as they make up 99% of all businesses in the EU.¹⁴ **The target is for 90% of SMEs to reach at least a basic level of 'digital intensity' by 2030** (e.g. having access to fast broadband (30 Mbps or above) and ICT specialists).



The context (4/4)

Advancing the rate of digitalisation in these four areas can generate a wide range of economic and social benefits

<p>Infrastructure </p>	<p>Skills </p>	<p>Businesses </p>	<p>Public services </p>
<p>The widespread deployment of very high capacity networks (fixed and mobile) has the potential to deliver significant economic and social value, and support the post-pandemic recovery. These networks will deliver faster, more reliable and flexible networks that have the potential to transform key sectors across the economy (including healthcare, transport, manufacturing and public services), enable greater innovation and support digital inclusion and transformation.</p>	<p>Basic digital skills are required in all types of jobs in the EU, including industries that were traditionally not related to digitalisation such as farming, health care or construction. For example, 98% of workplaces require managers or technicians to have at least basic digital skills. Digital skills have the potential to increase people's income as well as employment prospects as they are able to access a wider range of skilled jobs that require digital skills.</p>	<p>The digitalisation of processes could enable SMEs to reduce costs and to increase productivity through greater efficiency. SMEs with high digital intensity may be more likely to reach out to new customers by providing products and services online. It can further help foster innovation, leading to higher overall growth of the economy as SMEs represent 99.8% of all non-financial businesses in the EU and employ c.67% of the EU workforce.</p>	<p>The provision of e-government services has the potential to reduce frictions for citizens and businesses while interacting and transacting with government, which can lead to a significant reduction in time and costs. For example, EU's Once-Only project aims to reduce administrative burdens and facilitates cross-border businesses.</p>
<p>€1 trillion GDP 5G could add up to €1 trillion to European GDP (2021-2025).</p> <p>€2 trillion output 5G could drive up to €2 trillion in incremental gross output across Europe (2021-2025).^a</p> <p>20 million jobs 5G has the potential to create or transform up to 20 million jobs across all sectors of the economy.</p>	<p>€480 million GDP A study found that training and/or attracting an additional 1,000 ICT specialists in Greece was associated with an increase of €480m in GDP.</p> <p>€664 million earning benefits Learning basic digital skills can increase the income of individuals. It is estimated that the total learning benefits to the UK economy could reach around €664m by 2028.</p>	<p>8.9% increase in productivity Data-driven solution such as cloud-based computer power could increase SME productivity by 8.9%.</p>	<p>€11 billion savings The EU's Once-Only project is expected to save businesses €11 billion annually.</p> <p>855,000 hours saved The EU's Once-Only projects could further save businesses and citizens 855,000 hours.</p>

Sources: Accenture, The Impact of 5G on the European Economy, 2021; Eurostat, Small and Medium-sized businesses; European Commission, Shaping Europe's digital future; Vodafone, Foundation for economic and industrial research, Measuring the economic impact of digital skills in Greece; Cebr, The economic impact of Digital Inclusion in the UK, Deloitte Insights, Government Trends 2020

a) Gross output (GO) measures the total value of all goods and services made within a specific timeframe whereas Gross Domestic Product (GDP) measures the value of all finished goods and services made within a specific timeframe.

Objectives

The aim of this study is to provide a high-level analysis on the potential contribution towards the Digital Decade targets based on linked funding from National Recovery and Resilience Plans



This study

This study aims to contribute to this dialogue, providing a high-level qualitative analysis of how 20 Member States' National Recovery and Resilience Plans may spur development towards the Digital Decade targets.

To this end we have undertaken an analysis – assessing the progress that is required to achieve the Digital Decade targets and whether the National Recovery and Resilience Plans look to address these.

This report presents the findings of our analysis at an aggregate level, as well as more detailed analysis for a subset of ten selected member states.



NRRPs

The Commission will be conducting detailed assessments of the individual plans with the view to confirming the plans or suggesting changes ahead of the European Council's review. **This study does not seek to replicate these assessments nor express views on the adequacy or otherwise of particular plans.**

The approach

**Outline of framework
and methodology**



Overview of approach

The qualitative analysis assesses Member States' NRRPs against the Digital Compass targets, supported by high-level analysis of the indicators from the Digital Economy and Society Index (DESI) to track progress

Our approach synthesises qualitative pieces of information supported by quantitative analysis where possible, by identifying the current gaps using DESI indicators¹⁵, and identifying where relevant funding and proposals have been made to achieve the target.



National Recovery and Resilience Plans

The analysis has focussed on 20 Member States, accounting for c.72% of the RRF funding available.^a

The estimated breakdowns of funding are indicative as:

- Plans vary in their detail and structure – some provide specific breakdowns aligned to the EC guidance and the Digital Decade targets whereas others describe single packages of investment covering multiple areas, with no description of targeted outcomes.
- Investments in other areas of the NRRPs not explicitly linked to Digital may implicitly cover digital investment but have not been analysed.
- Member States may be planning to achieve the targets through separate national plans, which have not been reviewed as part of this study (as this study is focussed primarily on NRRPs). Indeed plans also vary in the mix of RRF funding together with funding from national budgets.



DESI Indicators

The EU's key indicator of digital progress, DESI, provides indicators that measure some of the key Digital Decade targets. Therefore it has been used as a proxy of the progress that is required to achieve digital development.



Digital Decade Targets

The targets set out by the Digital Compass provide the structure to qualitatively assess the extent to which the NRRPs can help achieve holistic digital development.

The qualitative analysis has been supported by high level quantitative analysis of some selected targets.

Member States included in the aggregate-level analysis:

Austria	Denmark	Italy	Portugal
Belgium	France	Latvia	Romania
Croatia	Germany	Lithuania	Slovakia
Cyprus	Greece	Luxembourg	Slovenia
Czechia	Hungary	Poland	Spain



Member States covered in deep-dive analysis (see page 35 onwards):

Czechia	Hungary	Romania
France	Italy	Spain
Germany	Poland	
Greece	Portugal	



These countries were selected because their NRRPs were published within the timeframe of analysis for this report, and the quantum of funding was relatively high compared to other EU Member States that are not covered.

a) Deloitte analysis

Alignment between the RRF, the Digital Decade Targets and DESI

Digital investment guidance for the RRF, the Digital Decade targets and DESI overlap but do not fully align in their 'roadmap' for digital development

The targets, DESI and RRF priorities

Member States were advised by the Commission to consider seven categories of digital investments. These broadly align to the four areas identified in the Digital Decade targets. The exception to this is greening of the digital sector.

The Digital Decade target areas have several targets within them. In this assessment, up to two targets have been selected in each area as representative, but not exhaustive, to provide high-level quantitative analysis to supplement qualitative analysis.

The targets have been selected to produce a set that:

- provides coverage of the four areas set out by the targets;
- enables achievement of wider digital development; and
- is quantifiable and measured where possible.

The selected targets broadly align with DESI indicators. However, DESI does not include direct measures for key targets such as 5G coverage, e-medical records and e-IDs.

Note that public services includes health services, however, because of the Digital Decade targets, education is covered under skills.

a) The measure is based on a subset of cloud services (hosting of the enterprise's database, accounting software applications, CRM software, computing power).

b) The Digital intensity Index (DII) measures the availability at firm level of 12 different digital technologies including access to fast broadband (30 Mbps or above) and ICT specialists.

c) The following life events are included in the scope: Regular business operations and Business Start-up; Moving; Owning and driving a car; Starting a small claims procedure; Family; Career and Studying.

d) Eurostat provides a measure of the % of the population accessing e-medical records, but this is a demand-side metric whereas the Digital Decade target is supply-side. The demand-side measure is still cited as context in some cases in this report.

Digital investment categories	Target area (Digital Decade)	Selected Digital Decade target	DESI indicator
Connectivity	Infrastructure	100% of households with gigabit connectivity	Coverage of households by any fixed Very High Capacity Networks (1b2)
		100% 5G coverage in populated areas	Not available
Digital capacities and advanced technology	Businesses	75% of European enterprises using cloud computing services	Businesses using cloud services (4a4) ^a
Digital-related investment in R&D		90% of SMEs with at least a basic level of digital intensity	Digital intensity Index (Not DESI) ^b
Digitalisation of businesses	Skills	80% of adults with at least basic digital skills	Adults with at least 'basic' digital skills (2a1)
Human capital		20m ICT specialists, with convergence between women and men	Number of ICT specialists (2b1)
E-government	Public services	100% online provision of key public services	Online Service Completion (5a3) ^c
Greening the digital sector		Access to digital medical records and use of digital ID	Not available ^d

Interpreting the data in this report

This report presents estimates of NRRP funding that is linked to Digital Decade targets, as well as illustrative projections to 2030 for key digitalisation metrics

NRRP funding linked to Digital Decade targets

This report presents estimates of the NRRP funding linked to Digital Decade target areas, at an aggregate level across 20 Member States and also at national level for selected individual Member States.

The **estimates are based on the NRRP documents of each Member State covered in this report**, which have been analysed in order to identify investments or funding packages that appear to be linked to each of the four Digital Decade pillars (Infrastructure, Businesses, Skills and Public services). Where possible, funding linked to specific targets within each pillar (e.g. gigabit or 5G) has also been identified.

The analysis is based on a **review of the plans that were first published by each of the 20 Member States** (as they came available) and **does not take account of subsequent changes or additional submissions** to those plans after the date of the first publication (see page 91 for links to the plan documents that were reviewed as part of this study).

The **attribution of funding to each pillar or target is based only on information publicly available at the time** each plan was first published and/or the analysis of that plan was undertaken. **In cases where funding appears to be linked to multiple pillars or multiple targets**, and where a breakdown has not been identified, the **funding is only included once in the total** funding amount linked to Digital Decade targets. **However, in attributing this funding to specific pillars or target areas, it is assumed that up to all the funding could be used to achieve the individual target** (in the absence of the funding being explicitly allocated to one target). For example, where a plan references funding to support 5G network infrastructure as well as other objectives, in our analysis the funding would still be described as 'funding linked to the 5G coverage target'.

As a result, there is **potential for the same funding to be attributed to more than one target area such that this funding is counted twice** in the analysis. Therefore, funding linked to individual pillars, or targets areas may represent an upper bound and may not sum to the same amount as the aggregate figures presented in this report.

Equally **where funding has not been explicitly linked to achieving a target**, it is **not allocated to that target** even though it may indirectly contribute to achieving it. For example, where a plan includes funding for improving availability of digital tools and connectivity in schools or hospitals, in our analysis, the funding would be allocated entirely to achieving the Digital Skills and Public services targets respectively. However, whilst it could perceivably contribute towards Digital Infrastructure targets as well, it would not be included as there is no explicit link to the target.

Digitalisation metrics: Illustrative projections to 2030

This report presents a range of digitalisation metrics for the EU as a whole and for selected individual Member States.

The analysis includes illustrative projections to 2030 for these metrics. Projections for future values are formed by using linear regression, based on the observed trend in the historic data from 2015 onwards.

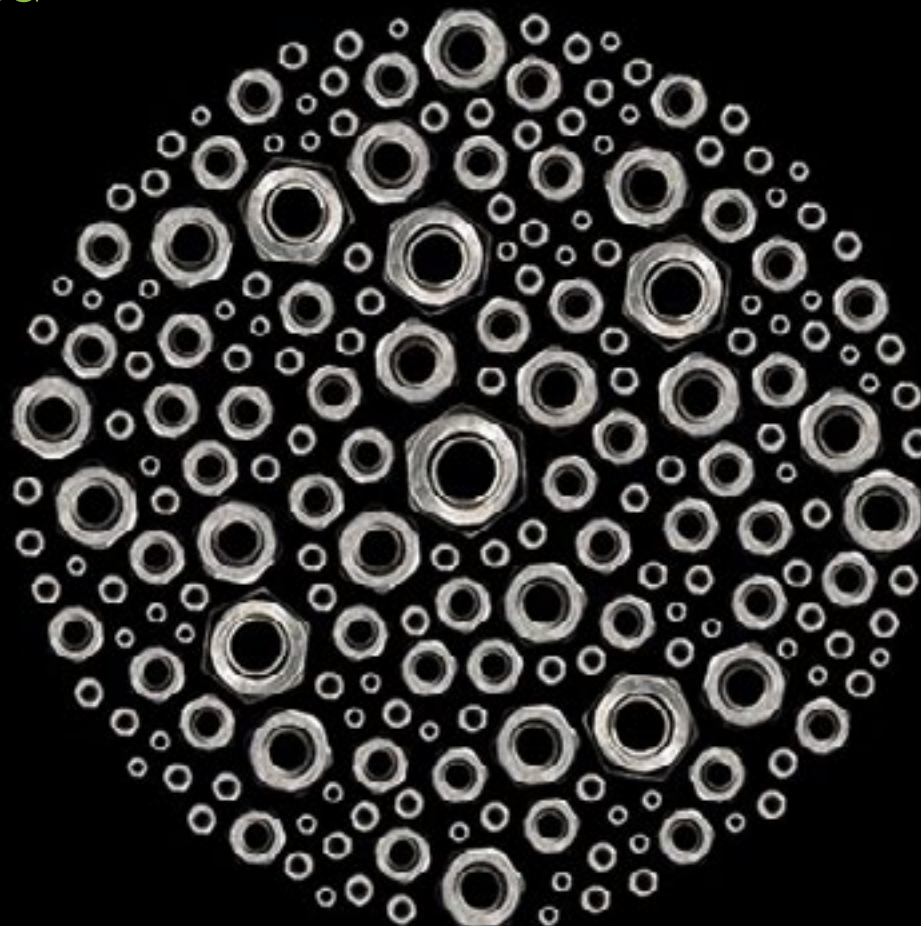
These projections may be useful as a high-level indication of the potential future trajectory of each metric based on current trends, but should be interpreted with caution. Due to the multitude of factors at play in achieving digital transformation, historic trends may not always provide an accurate indication of future trends.

In particular, the trends may not be linear in the future, for example, extending connectivity to rural areas is typically more costly and challenging than in urban areas, which can mean that growth rate in coverage declines over time after an initial period.

The projections are also dependent on the accuracy of historic third-party data over the period 2015-2020, which may be subject to a margin of measurement error and/or differences in measurement methodology across Member States.

Overview of selected Member States

**Progress towards the Digital
Decade targets**



Overview of the 20 selected NRRPs

Funding varies significantly across the four pillars, with relatively few NRRPs linking funds to ICT specialists, e-IDs and cloud adoption

Target areas	Infrastructure		Skills		Businesses		Public services		
	Household gigabit connectivity	5G coverage in populated areas	Adults with basic digital skills	ICT specialists	SME basic digital intensity	Cloud users	Online services availability	e-Medical records	e-IDs
Digital Decade Target (2030) ¹⁶	100%	100%	80%	20m	90%	75%	100%	100%	80%
EU27 Average (2020)	44%	14%	58%	8.51m	60% ^f	18%	90%	- ^a	- ^a
No. of NRRPs the target is mentioned in	17/20	16/20	20/20	9/20	20/20	12/20	20/20	15/20	9/20
No. of NRRPs with funding linked to target ^b	16/20	13/20	20/20	9/20	19/20	10/20	20/20	13/20	7/20
Sum of related funding linked to target	Up to €16.9bn	Up to €15.2bn	Up to €44.9bn	Up to €5.2bn	Up to €27.8bn	Up to €12.4bn	Up to €18.9bn	Up to €8.2bn	Up to €2.8bn
Target on track to be met by 2030 based on trend analysis ^d	No ^c	-	No	No	No	No	Yes	-	-
Themes	<p>Infrastructure packages do not always distinguish between 5G and gigabit.</p> <p>Specific allocation of funding to 5G and gigabit would be required to understand the progress towards these two separate Digital Decade targets.</p> <p>The challenges of extending coverage in rural areas do not appear to be addressed in most of the NRRPs.</p>		<p>All countries have committed to improving basic adults and student digital skills.</p> <p>Investments include provision of portable devices.</p> <p>Reference to ICT specialists is limited, funding of PhD programmes or more advanced trainings is considered as spending in ICT specialists.</p>		<p>Most countries have specific spending commitments to support SME digitalisation, although general spending towards business digitalisation, not targeted specifically to SMEs, is also accounted for.</p> <p>Cloud computing investments are often part of broader packages linked to business digitalisation.^e</p>		<p>Online services availability cover a wide range of investments including digital upgrading of information systems / infrastructure. Only investments related to key public services are considered.</p> <p>E-medical records are often part of the wider Health Packages in the NRRPs and specific investments for the development of e-records is not available for all countries.</p> <p>E-IDs is missing from many of the plans but may be part of the solution towards online services.</p>		

a) No appropriate data available at the time of undertaking the analysis; b) Deloitte analysis, due to the difference how specific plans are, these numbers may include the value of the wider package or were double-counted under two sub-areas of the Digital Decade targets, and thus may be an overestimate; c) Trends are promising, but rural coverage will be challenging; d) Based on current trends analysis, further details on the deep dive pages for each target. For 5G coverage, e-medical records and e-IDs there is insufficient historical data to track trends; e) Cloud computing investments target SMEs and all enterprises separately in some cases. Thus, the cloud users figure includes both investments to account for this. Therefore, SMEs basic digital intensity does not cover cloud investments to avoid double counting. f) Reflects 2019 EU27 average.

Infrastructure

Overview of Member State plans and progress on gigabit connectivity and 5G coverage of populated areas





Very High Capacity Networks (VHCN)

Despite recent encouraging growth in rollout of gigabit connectivity, there remains a risk that the proposed investments could fail to deliver the 2030 target, particularly given the challenges of rural deployment

a) This is likely an overestimate of the actual value due to double counting of broader investment packages that consider 5G and gigabit networks without providing a detailed breakdown

Current trend

Overall connectivity has improved across the EU27, and Member States are increasingly making progress to increase the coverage further.

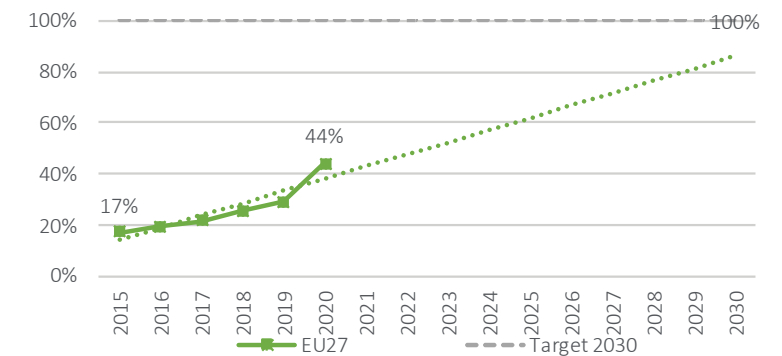
- For instance, Next Generation Access (NGA) network coverage has increased by 17.2 percentage points in a five-year period, from 66.3% in 2015 to 86% in 2020.¹⁷
- The proportion of households covered with VHCNs to enable gigabit connectivity across the EU has increased from 17% in 2015 to 44% in 2020¹⁸. However this is still 56 percentage points below the 100% coverage target for 2030.
- Despite this progress, additional funding is likely to be required to extend the coverage to rural and remote areas as the associated cost of infrastructure deployment in those areas, especially to enable gigabit connectivity, can be expected to be very high.

National Recovery and Resilience Plans

Most NRRPs have dedicated specific funding for the rollout of gigabit networks, which are often complemented by additional funding from National Broadband Plans of c.€78bn.¹⁹

- In some NRRPs, gigabit networks were part of a broader digital infrastructure package, also including 5G rollout. Therefore, the analysis may double count investments in gigabit and 5G deployment, likely resulting in overestimating the actual investment committed.
- Funding linked to broadband rollout more broadly that does not enable gigabit connectivity has not been considered for the analysis.

Households covered by VHCN*



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression.

* Illustrative projection to 2030 estimated using simple linear forecast based on historic data from 2015 to 2020. Risk that this may over/under state the actual outturn particularly given growth between 2019 and 2020.

Summary of plans

Proposals to support VHCN Household Coverage	
No. of plans with funding linked to target	16/20
Funding linked to the target	Up to €16.9bn ^a
Funding linked to the target as a proportion of total funding (NRRP)	3%

 **Infrastructure**

5G coverage

NRRPs vary in terms of detail and emphasis placed on 5G; given that many commercial deployments of 5G remain at a nascent stage across Member States, this means that achievement of the 5G target appears particularly uncertain

a) This is likely an overestimate of the actual value due to double counting of broader investment packages that consider 5G and gigabit networks without providing a detailed breakdown.

Current trend

In many Member States, 5G rollout has started but is in the early stages of deployment. Currently 14% of populated areas in the EU are covered by 5G (with no historic data to analyse trends²⁰). Even in Member States where 5G rollout appears most advanced, the rollout has been predominantly in major cities and large towns. In several Member States spectrum identified for 5G has either only recently been awarded or is still to be assigned, potentially limiting the extent of deployment to date.

Significant additional investment will likely be required to promote the further rollout of 5G networks across Europe and achieve the target of 100% coverage in populated areas. This could, in turn, also support the progression to 6G.

National Recovery and Resilience Plans

Most EU countries considered in this analysis include increased 5G rollout as part of their NRRPs.

- The level of commitment to deploy 5G networks varies across countries. In some countries, 5G deployment was part of a broader digital infrastructure package, while others have linked specific funding to 5G.
- The analysis may have double counted some of the investment in 5G and gigabit networks when they have not been distinguished in the NRRPs.

5G specific funding from the NRRPs are further complemented by additional investments from the National Broadband Plans of c.€78bn.²¹

Summary of plans

Proposals to support 5G coverage	
No. of plans with funding linked to target	13/20
Funding linked to the target	Up to €15.2bn ^a
Funding linked to the target as a proportion of total funding (NRRP)	3%



Skills

Overview of Member State plans and progress on promoting basic digital skills and the number of ICT specialists





Adult basic digital skills

The current trajectory indicates a material risk that the 2030 target for Digital Skills could not be met unless there is a significant acceleration

Current trend

The average proportion of adults with basic digital skills across the EU27 is 58% in 2020.²² This is 22 percentage points lower than the 80% target.

Based on its current trajectory the proportion of adults with basic digital skills is expected to reach circa 66% by 2030 in absence of any further reforms or investment such as the RRF or other forms of funding.^a Achieving the target will require a significant acceleration in the rate of adults obtaining basic digital skills over the next few years.

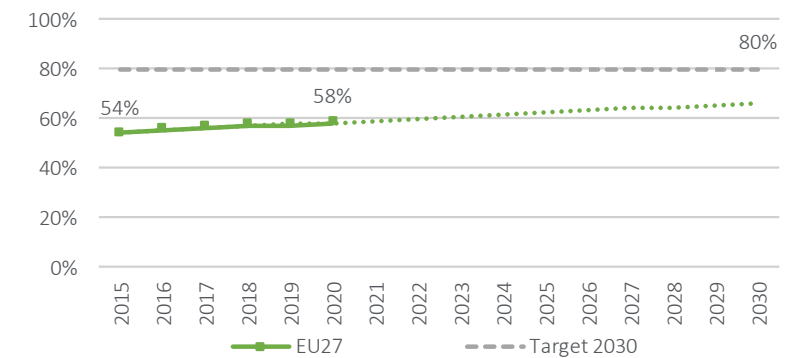
National Recovery and Resilience Plans

NRRPs have linked specific funding towards the following areas that are considered to be supporting the digital skill level of the adult population:

- **Digital skills for all:** Investment in digital technologies and services such as distance learning or educational online platforms that supports the development of digital skills of all people, including vulnerable or excluded groups.
- **Digital skills for students:** Digitalisation of the educational system, including digital equipment for schools and e-education programs, which will contribute to an increased digital skills level of the adult population in the future.
- **Digital skills for workers:** Vocational programmes that aim to increase digital skills of the workforce across different industries.

a) Illustrative projection to 2030 using a simple linear forecast based on historic data from 2015 to 2020.

Adults with basic digital skills*



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

* Illustrative projection to 2030 estimated using simple linear forecast based on historic data from 2015 to 2020

Summary of plans

Proposals to support adults develop basic digital skills	
No. of plans with funding linked to target	20/20
Funding linked to the target	Up to €44.9bn
Funding linked to the target as a proportion of total funding (NRRP)	8%



ICT specialists

Meeting the 2030 target will require the number of ICT specialists to increase by 135%; however, less than half of NRRPs specifically link funding to this target area and the amount of linked funding is relatively low compared to other areas

a) Illustrative projection to 2030 using a simple linear forecast based on historic data from 2015 to 2020.

Current trend

The total number of ICT specialists currently in the EU27 is 8.51 million, 11.49 million short of the 2030 target of 20 million.²³

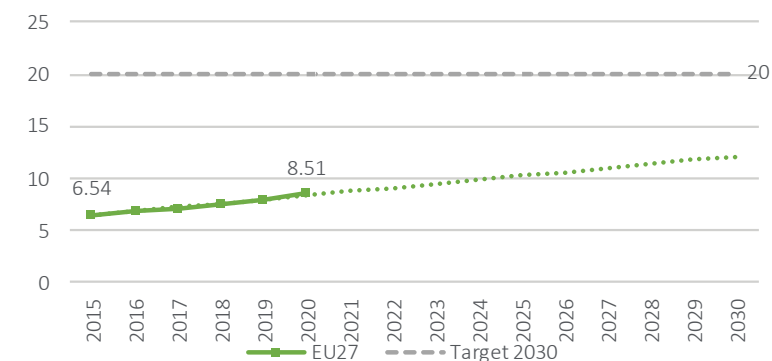
Based on a simple linear forecast using historic data from 2015 to 2020, it might be expected to reach circa 12 million by 2030 if conditions remained the same.^a Achieving the target will require a significant acceleration in the number of ICT specialists across the Member States over the next few years.

National Recovery and Resilience Plans

NRRPs provide limited reference to ICT specialists and often consider them as a part of a broader investment package.

- According to the European Commission, ICT specialists are defined as those with advanced digital skills that contribute to the further development of the digital economy. Based on this and limited reference to ICT specialists in the National Recovery Plans, funding for PhD programmes or more advanced training has also been considered as spending on ICT specialists.
- For instance, 9 out of the 20 countries have linked specific funding to promote an increase in ICT specialist. Except for one country, NRRPs have not specified by how much the number of ICT specialist should increase through the funding.
- However, EU countries have committed to improve the digital skills level of adults and students, supported by large investment packages, that could indirectly increase the amount of ICT specialists.

ICT specialists (millions)*



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

*Illustrative projection to 2030 estimated using simple linear forecast based on historic data from 2015 to 2020

Summary of plans

Proposals to support the development of ICT specialists	
No. of plans with funding linked to target	9/20
Funding linked to the target	Up to €5.2bn
Funding linked to the target as a proportion of total funding (NRRP)	1%

Businesses

Overview of Member State plans and progress on promoting digital intensity of SMEs and cloud adoption





Digital intensity of SMEs

SME digitalisation – as captured by the Digital Intensity Index – is relatively stable over time and requires substantial growth to reach the 2030 target; nearly all NRRPs have linked funds to this objective

a) Illustrative projection to 2030 using a simple linear forecast based on historic data from 2015 to 2019.

Current trend

The proportion of SMEs with at least a basic level of digital intensity across the EU27 is 60% in 2019.²⁴ This is 30 percentage points lower compared to the target for 90% of SMEs to achieve a basic level of digital intensity by 2030.

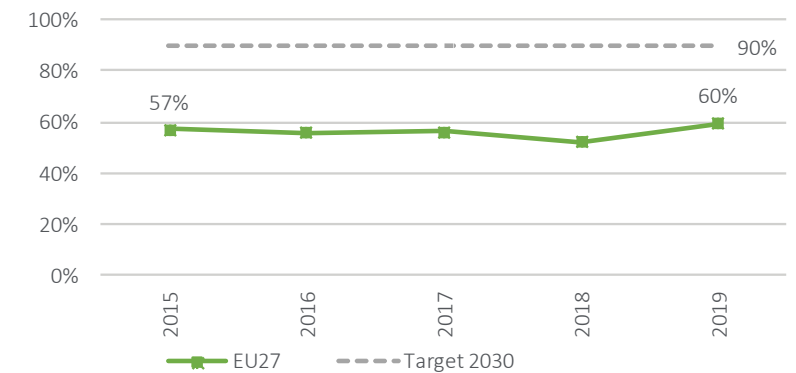
Based on the previous 5 years of SME digital intensity, there is no clear trajectory towards the target. On this basis, the current gap to the target could be expected to persist in the absence of any reforms or investments such as the RRF or other forms of funding.^a

National Recovery and Resilience Plans

Spending commitments towards SMEs digitalisation are identified in most of the National Recovery Plans.

- The Digital Intensity Index (DII) is the underlying metric behind the target and tracks the availability of 12 different digital technologies at firm level. Technologies examined include, among others, access to fast broadband (30 Mbps or above), resource to ICT specialists and internet for at least 50% of persons employed. Thus, SMEs having a score of 4 or higher out of a 12-point scale are considered as having at least a basic digital intensity.
- Proposed investments by the countries studied to achieve the target include financial instruments to support investments in research and innovation, automated software processes and sector specific investments targeting SME digitalisation.
- Funding that may be available as part of a broader package has been excluded from the analysis as there is no reliable way to apportion this funding.

Digital intensity of SMEs



Source: Eurostat (DII), Deloitte analysis

Summary of plans

Proposals to support digital intensity of SMEs	
No. of plans with funding linked to target	19/20
Funding linked to the target	Up to €27.8bn
Funding linked to the target as a proportion of total funding (NRRP)	5%



Cloud computing

Cloud adoption trends reflect the broader trend of SME digitalisation; with half of NRRPs linking funding to this area specifically, this may not be sufficient to meet the Digital Decade aspirations in this area

Current trend

The proportion of businesses using certain cloud computing services across the EU27 is 18% in 2020.²⁵ This is 57 percentage points lower compared to the target for 75% of European enterprises to take up cloud computing by 2030.

Based on a simple linear forecast using historic data from 2015 to 2020, the proportion of enterprises that have taken up cloud computing is expected to reach circa 40% by 2030 in absence of any further reforms or investment such as the RRF or other forms of funding, which is 35 percentage points lower compared to the target.^a Achieving the target will require a significant acceleration in the rate of businesses adopting cloud computing services over the next few years.

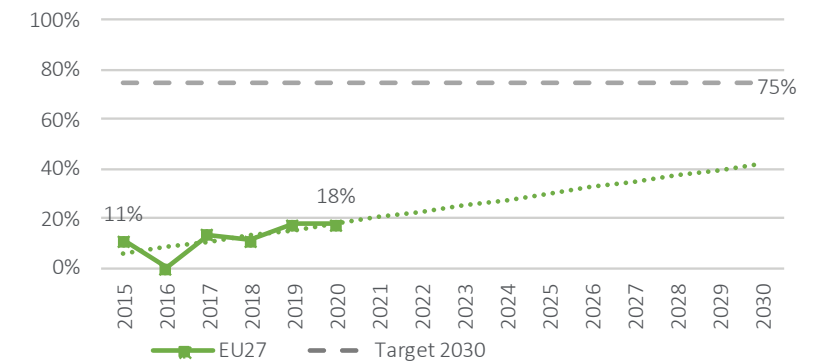
National Recovery and Resilience Plans

Most NRRPs have made commitments towards cloud computing take-up by enterprises.

- Proposed measures by Member States include tax credits to businesses using cloud computing, and investments in cloud infrastructure and cloud skills.
- The analysis has included specific investment to increase the digitalisation of all enterprises, including SMEs and large enterprises.
- Only investments and reforms that are directly targeting cloud computing take-up or facilitate the adoption of the relevant technology have been considered in the analysis. Funding that may be available as part of a broader package has been excluded.

a) Illustrative projection to 2030 using a simple linear forecast based on historic data from 2015 to 2020.

Businesses using cloud computing*



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

* Illustrative projection to 2030 using a simple linear forecast based on historic data from 2015 to 2020.

Summary of plans

Proposals to support business cloud computing	
No. of plans with funding linked to target	10/20
Funding linked to the target	Up to €12.4bn
Funding linked to the target as a proportion of total funding (NRRP)	2%

Public services

Overview of Member State plans and progress on promoting online service completion and provision of e-medical records and e-IDs





Online service completion

Achieving the 100% target for online service completion appears feasible; however, this is a relatively narrow measure and NRRPs generally reflect a broader need to support digitalisation of public services

a) Illustrative projection to 2030 using a simple linear forecast based on historic data from 2015 to 2020.

Current trend

The share of administrative steps related to major life events that can be done online (online service completion) across the EU27 is 90% in 2020.²⁶ This is 10 percentage points lower compared to the target for 100% online provision of key public services. Online public services include among registering a business, family related support etc.

Projections to 2030 using a simple linear forecast based on historic data from 2015 to 2020 indicate that the online provision of key public services is expected to meet the EU target by 2030 even in the absence of any further investments or reforms such as the RRF or other forms of funding.^a

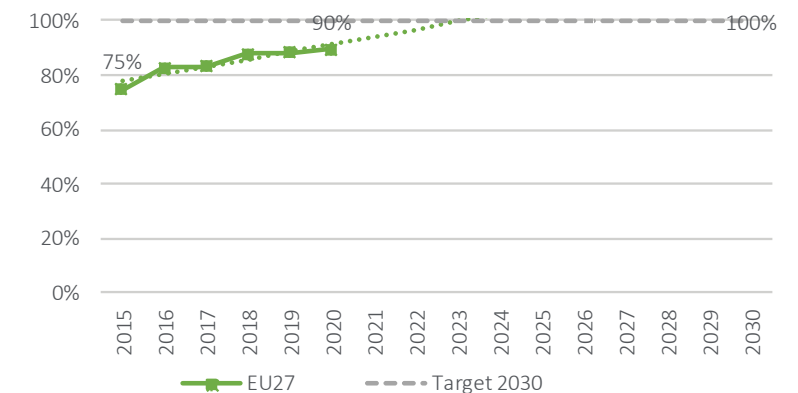
However, even when the target is achieved, it is likely that a wider range of services that could be more efficient online is still accessible offline due to the narrow focus of this metric.

National Recovery and Resilience Plans

All the Member States considered in the analysis have made spending commitments to support the objective.

- Investments to reach the target focus on the digital upgrading of the state and public administration, including teleworking, migration of IT applications to cloud and digitalisation of various state departments.
- Spending commitments for the development of e-IDs and e-medical Records have been excluded and addressed separately.
- It is worth noting that the metric 'Online Service Completion' consists of 8 key public services related to major life events. Therefore, the narrow focus of the indicator does not capture the wider digitalisation of public service provision.

Online service completion*



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

* Illustrative projection to 2030 estimated using simple linear forecast based on historic data from 2015

Summary of plans

Proposals to support online service completion	
No. of plans with funding linked to target	20/20
Funding linked to the target	Up to €18.9bn
Funding linked to the target as a proportion of total funding (NRRP)	3%



Public services

E-medical records and E-IDs

Of the 20 NRRPs reviewed, 13 plans linked funding explicitly to e-medical records, while 7 plans explicitly linked funding to electronic identification

Current trend

Significant funding has been linked to e-health and digitisation of healthcare services, however for this target this study focusses on funding linked explicitly to e-medical records (in whole or in part). Most of the plans recognise the need for the development of e-medical records, however 13 out of the 20 plans have made explicit spending commitments to address this need.

The funding available to meet this target is relatively low, however it does not account for investments to digitalise e-health. Many NRRPs have significant commitments for the development of telemedicine and teleconsultation as well as the digitalisation of the health care system in general. While e-medical records might be a part of those broader health packages, the spending is not reflected in the analysis as there is no reliable way to apportion this funding.

National Recovery and Resilience Plans

The development of electronic identification is the least addressed target in the NRRPs with 9 out of the 20 countries mentioning the target and 7 out of 20 countries making a financial commitment.

Governments may consider e-IDs as an enabler of the provision of key public services, and therefore only acknowledge them under broader packages to promote the digitalisation of public administration.

NRRPs that acknowledge the target, but do not allocate a specific funding towards e-IDs, have not been considered in the analysis.

Summary of plans | E-medical record target

Proposals to support E-Medical Records	
No. of plans with funding linked to target	13/20
Funding linked to the target	Up to €8.2bn
Funding linked to the target as a proportion of total funding (NRRP)	1%

Summary of plans | E-IDs target

Proposals to support E-IDs	
No. of plans with funding linked to target	7/20
Funding linked to the target	Up to €2.8bn
Funding linked to the target as a proportion of total funding (NRRP)	0.5%

Member States Deepdives

**Progress towards the Digital
Decade targets**



Summary of gap to 2030 Digital Decade targets across Member States

The size of the gap to 2030 targets varies greatly across Member States, particularly with regard to VHCN; some Member States could risk an imbalance between available connectivity and capabilities to exploit this connectivity successfully.

The size of the gap to achieving 2030 Digital Decade targets varies greatly across Member States. This is particularly evident in relation to VHCN coverage, where Denmark and Luxembourg are already extending coverage to the last 10% of households, whilst Greece has yet to reach the first 10%.

Whilst the digitalisation measures are often correlated, the comparison suggests that some Member States may face greater challenges in certain areas.

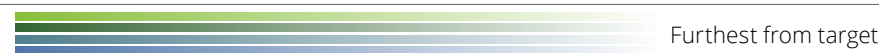
For example, Member States such as Latvia, Portugal and Romania have already achieved relatively high levels of VHCN coverage, but may face a risk that employees and firms lack the capability to fully exploit this connectivity as a driver of growth, absent sufficient investment. Equally, Member States such as Germany and Austria have higher levels of digital skills and intensity, but their slower progress in VHCN deployment could entail a risk that connectivity does not meet individual and business needs.

The comparisons presented here should be interpreted with caution. The set of metrics used in this analysis does not capture the full complexity of current and future digitalisation in each Member State.

Gap in percentage points between current level and 2030 target level

	Infrastructure	Skills		Businesses		Public Services
Country	VHCN	Basic Digital Skills	ICT Specialists (as a % of population)	Basic Digital Intensity	Cloud Computing	Online Service Completion
2030 TARGET	100%	80%	4.5%	90%	75%	100%
Denmark	93%	70%	2.7%	85%	41%	99%
Luxembourg	92%	65%	3.0%	66%	16%	90%
Spain	89%	57%	1.5%	64%	16%	96%
Latvia	88%	43%	1.7%	46%	11%	96%
Portugal	83%	52%	1.9%	59%	16%	99%
Romania	68%	31%	1.0%	31%	7%	70%
Belgium	66%	61%	2.1%	74%	31%	88%
Slovenia	66%	55%	2.0%	54%	17%	91%
Lithuania	61%	56%	1.6%	71%	17%	96%
Poland	60%	44%	1.5%	38%	7%	87%
Slovakia	47%	54%	1.9%	51%	14%	85%
France	44%	57%	1.8%	57%	15%	93%
Croatia	43%	53%	1.5%	54%	22%	73%
Hungary	43%	49%	1.7%	42%	11%	87%
Germany	33%	70%	2.4%	67%	12%	90%
Italy	30%	42%	1.4%	58%	15%	92%
Czechia	29%	62%	2.1%	74%	16%	82%
Austria	14%	66%	2.2%	69%	11%	97%
Cyprus	10%	45%	1.4%	63%	14%	79%
Greece	7%	51%	0.7%	32%	7%	84%

Key: 2030 target level



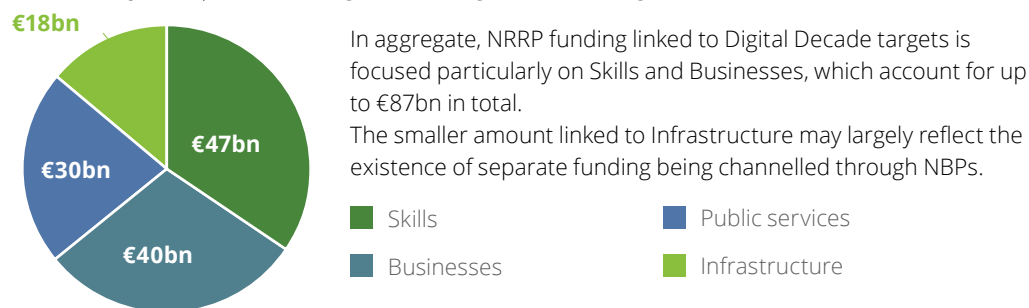
Furthest from target

Source: DESI, DII and Eurostat data for latest available year (2019 for Basic Digital Intensity and 2020 for all other metrics).

Summary of NRRP funding linked to Digital Decade targets across Member States

Skills and Businesses are the pillars with the largest amount of linked funding in absolute terms, although there are wide variations across NRRPs with regard to the focus on each of the four Digital Decade target areas.

Overall snapshot | NRRP funding linked to Digital Decade target areas (Total, 20 countries)



Source: Deloitte analysis of NRRPs. Figures may not add up to the total NRRP funding linked to Digital Decade targets, due to some funding packages cutting across more than one pillar.

Breakdown by country

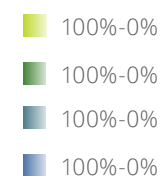
Across countries there are wide variations in approach. In most plans, links to Skills and Public services are prevalent, whereas there are several examples of plans with limited or no funding linked to Infrastructure and Businesses. However, the analysis below does not include funding outside of the NRRPs (e.g. Infrastructure area does not

include funding from NBPs) and funding has been allocated to a target only where it is explicitly linked to that target, even though it may indirectly contribute to achieving a target. As a result, allocations may not reflect the actual funding allocation for some areas (see page 20 for details on the methodology and interpreting the analysis).

The remainder of this section sets out more detailed analysis for ten selected Member States: Italy, Spain, France, Germany, Poland, Greece, Portugal, Romania, Hungary and Czechia.

Breakdown by country

	NRRP funding linked to DD target areas	Infrastructure	Skills	Businesses	Public Services
Italy	€43.3bn	16%	34%	34%	17%
Spain	€25.4bn	16%	29%	48%	21%
France	€22.1bn	4%	59%	24%	13%
Germany	€10.5bn	14%	17%	27%	41%
Poland	€7.5bn	35%	25%	22%	19%
Portugal	€4.0bn	5%	46%	16%	33%
Greece	€4.5bn	12%	40%	11%	37%
Romania	€4.3bn	2%	26%	20%	54%
Austria	€1.5bn	61%	12%	16%	11%
Czechia	€1.5bn	18%	33%	28%	21%
Hungary	€1.4bn	0%	95%	0%	5%
Slovakia	€1.3bn	0%	29%	16%	55%
Slovenia	€1.2bn	2%	5%	6%	87%
Lithuania	€0.9bn	53%	4%	11%	33%
Belgium	€0.7bn	13%	39%	2%	45%
Latvia	€0.5bn	3%	13%	40%	43%
Croatia	€0.5bn	27%	34%	8%	30%
Cyprus	€0.3bn	20%	36%	30%	14%
Denmark	€0.1bn	10%	52%	27%	10%
Luxembourg	€0.0bn	0%	87%	0%	13%
AVERAGE		16%	33%	20%	31%



Czechia

Overview of the plans and progress against targets

Around 23% of Czechia's total NRRP funding has been allocated to digital transformation, of which up to around €1.5bn appears to be linked to Digital Decade targets.^a Achieving these will require a significant improvement across Infrastructure, ICT specialists and cloud adoption.



Infrastructure



Skills



Businesses



Public services

Progress against targets



VHCN household coverage

- 29% Czechia (2020)
- 44% EU (2020)
- 100% Target (2030)



Basic digital skills

- 62% Czechia (2020)
- 58% EU (2020)
- 80% Target (2030)



ICT specialists (million)

- 0.22 Czechia (2020)
- 0.48 Target (2030)



Basic digital intensity

- 74% Czechia (2019)
- 60% EU (2019)
- 90% Target (2030)



Cloud adoption

- 16% Czechia (2020)
- 18% EU (2020)
- 75% Target (2030)



Online services completion

- 82% Czechia (2020)
- 90% EU (2020)
- 100% Target (2030)

Commentary and NRRP commitments

VHCN coverage in Czechia has been expanding gradually over the last five years and the first 5G commercial deployments were made in 2020. However, achieving the EU targets by 2030 will require significant investment in network upgrades over the next few years.

Czechia's NRRP outlines investments of up to €0.3bn linked to the development of 5G and VHCN.

In terms of digital skills Czechia is broadly in line with the EU27 average, but will still need to increase the proportion of the population with digital skills by around 18 percentage points to achieve the EU target. The number of ICT specialists has been increasing gradually, but is still less than half the target level.

Across a wide range of packages related to digital skills, a total of up to €0.5bn in the NRRP has been linked to achieving the skills targets.

Digital intensity across businesses is higher compared to the EU27 average (74% vs 60%), and progressing well towards the target of 90%. However adoption of cloud computing remains relatively low and will need to increase significantly over the decade to achieve the EU target.

Czechia's NRRP has linked up to around €0.4bn of funding to business digitalisation and adoption of cloud computing services.

Online provision of public services has been increasing over the last five years in Czechia. To achieve the EU target Czechia needs to increase online service completion by 18 percentage points by 2030.

Up to around €0.2bn of funding within Czechia's NRRP is linked to digitalisation of public services, with up to a further €0.1bn linked to e-medical records.

a) Estimate derived by converting local currency to Euros using exchange rate of 25.558 CZK/Euro as at 01/06/21.

Czechia

Infrastructure

Achieving the EU targets for VHCN and 5G coverage will require a significant increase in the rate of network rollout and the investment to support it, given the current position; Up to around €0.3bn of funding is linked to achieving the targets in the plan.

Gigabit connectivity

Current trend

VHCN networks cover less than a third of households, which is well below the EU27 average of 44%. Based on the current trajectory, the country is not on track to meet the 100% target absent additional measures. Achieving the EU target will require VHCN coverage to be extended to 71% of households in the country by 2030, requiring significant network investment in the coming years.

National Recovery and Resilience Plans (NRRPs)

Within Czechia's plans, up to around €0.2bn of funding is linked to a series of reforms and investments to support the development of digital high capacity networks across the country.

5G coverage in populated areas

Current trend

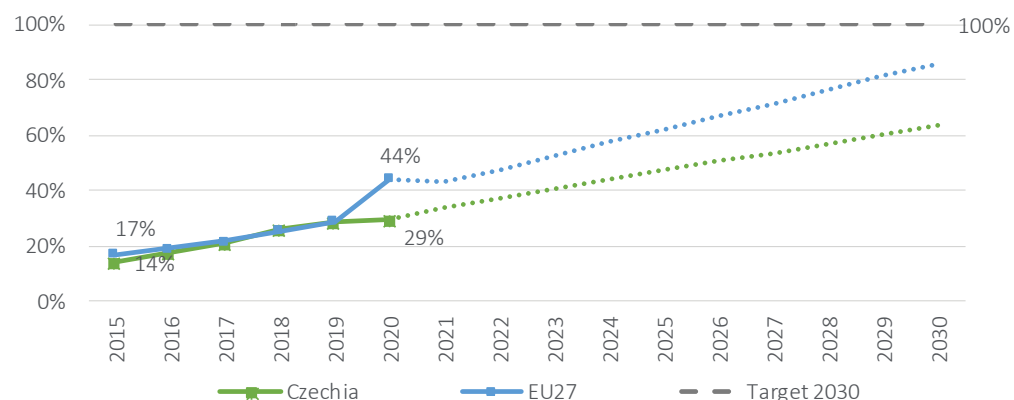
Czechia had assigned 17% of harmonized 5G spectrum as of the end of 2020, which has impacted on rollout to date.²⁷

4G population coverage in Czechia was reported to have reached 99.6% as at the end of 2020.²⁸ In terms of 5G coverage, mobile network operators (MNOs) in Czechia have announced that they have undertaken initial commercial 5G deployments mainly in densely populated urban areas (e.g. Prague, Brno etc.). For example, Vodafone announced in October 2020 that it had launched its 5G Non-Standalone (NSA) network, and by February 2021 it had reported that 5G was available in more than 130 cities and smaller municipalities, covering more than 25% of the population. In December 2020, T-Mobile announced its 5G network covered one million people in 14 cities (around 10% of the population).²⁹ This suggests that Czechia is progressing well towards the 5G coverage EU target but there is clearly significant further investment needed to reach the target.^a

National Recovery and Resilience Plans (NRRPs)

The NRRP outlines reforms and investments with a total value of up to around €0.1bn linked to support 5G deployment including infrastructure and 5G services.

VHCN (% of households covered)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression.

a) Many, if not all, of the 5G deployments that have been announced are understood to be based on non-standalone (NSA) architecture, which may not deliver the full extent of network performance and features (e.g. ultra low latency), required to enable the full extent of 5G use cases. 5G Standalone (SA) deployments are expected to deliver this but are likely to require significant additional investment.

Czechia

Skills

Across several packages related to digital skills, a total of up to €0.5bn has been linked to achieving the EU targets, however achieving targets will require 18 percentage point increase in the proportion of people with basic digital skills and more than doubling the number of ICT specialists.

Adult basic digital skills

Current trend

The proportion of the population with basic digital skills has been increasing in recent years and reached 62% in 2020, above the EU27 average of 58%. However, if the recent trend continues on the same trajectory, Czechia may not achieve the target of 80% by 2030. An acceleration in the development of skills and the investment to support it is required to achieve the target by 2030.

National Recovery and Resilience Plans (NRRPs)

Up to around €0.5bn of funding has been linked to the development of digital skills including the implementation of the revised DigCompEd curriculum and framework (€0.02bn), equipping schools with digital technologies (€0.2bn) and vocational training enhancing digital skills (€0.3bn).

ICT specialists

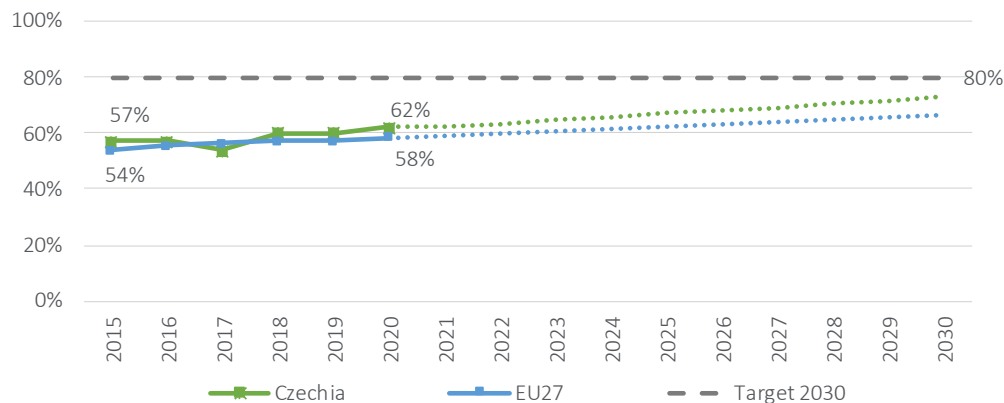
Current trend

The number of ICT specialists in Czechia has increased by around 22% from 2015 to 2020. However, achieving the EU target will require more than a doubling in the number of ICT specialists in the country by 2030.

National Recovery and Resilience Plans (NRRPs)

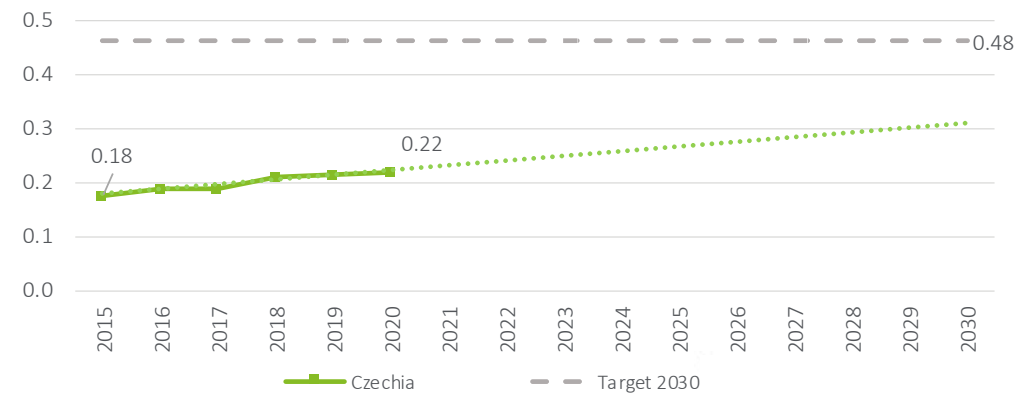
The NRRP includes up to around €0.01bn of funding linked to enhancing competences in cyber security and increasing the number of cyber security specialists.

Individuals with at least basic digital skills (% of 16-74 population)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression.

Number of ICT specialists (millions)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression. The Member State share of the total EU ICT specialists target (20m) has been apportioned based on population share

Czechia

Businesses

Czechia appears to be progressing well towards the EU target on SME digitalisation, however further improvement in cloud adoption is required to meet the targets; Up to around €0.4bn of Czechia's NRRP funds have been linked to the digitalisation of SMEs and cloud computing.

Digital intensity of SMEs

Current trend

Czechia appears to be progressing well towards the EU target on SME digitalisation, with 74% of SMEs reported to have at least a basic level of digital intensity, well above the EU27 average of 60% (although in previous years it was broadly tracking the EU27 average). However, reported levels of digital intensity have changed from year to year and to achieve and sustain the EU target will still require further growth in SME digital adoption.

National Recovery and Resilience Plans (NRRPs)

Within Czechia's plans, up to around €0.4bn is linked to digitalisation of enterprises including setting up a system of support for investment and development of innovative companies, start-ups and new technologies, support for digital transformation technologies, automation and software to support decision making.

Businesses using cloud computing

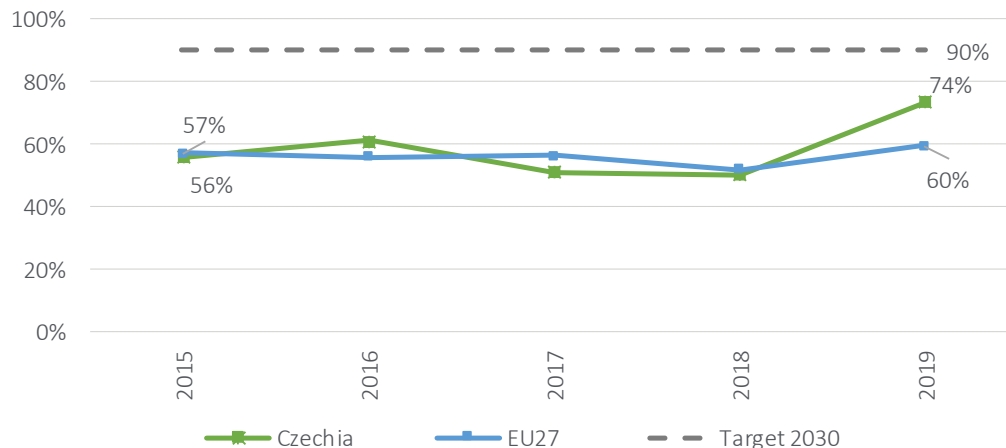
Current trend

Levels of cloud adoption amongst businesses remains relatively low at 16% in 2020, albeit broadly in line with the EU27 average of 18%. Achieving the EU target will require around a 59 percentage point increase in cloud adoption by 2030.

National Recovery and Resilience Plans (NRRPs)

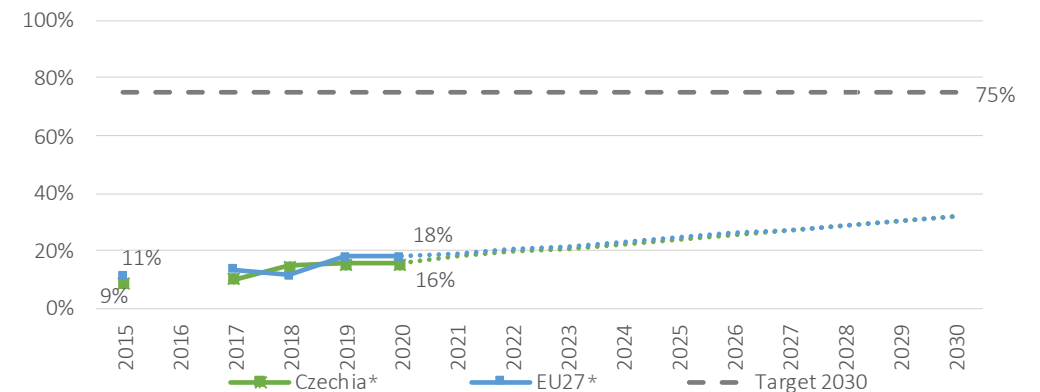
Czechia's plans contain funding of up to around €0.03bn that has been explicitly linked to cloud computing and related services including a platform for SME education that will answer all questions regarding AI, cloud and robotics and a joint group for the support and certification of technologies deemed to be 'strategic', including cloud.

SMEs with at least a basic level of digital intensity (%)



Source: Eurostat (DII)

Businesses purchasing advanced cloud computing services (%)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression.

* Missing data for 2016

Czechia



Public services

Czechia appears to be progressing well towards the EU target on use of online public services, however reported use of e-medical records is well below the EU target; Up to around €0.2bn of the NRRP funds in Czechia have been linked to the digitalisation of public services, with a further €0.1bn linked to the development of e-medical records.

Online public services

Current trend

In 2020 around 82% of administrative steps related to major life events could be actioned online in Czechia, compared to the EU27 average of 90% and the EU 2030 target of 100%. However, whilst continued transition to digital access is still needed, levels of online access have increased by 24 percentage points since 2015, suggesting that Czechia is on the trajectory to reach the EU target.

National Recovery and Resilience Plans (NRRPs)

Up to around €0.2bn of funding is linked to the provision of key public services including building and developing basic registers and facilities for eGovernment, creation of electronic tools for collecting data on public administration activities and creating the preconditions of digital justice.

E-medical records and e-IDs

Current trend

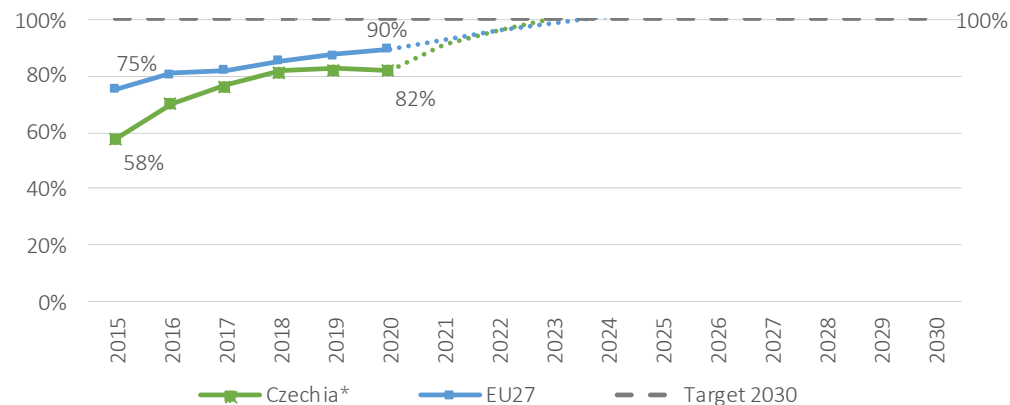
In 2020 only 2% of individuals were reported to have accessed personal health records online, compared to an EU27 average of 10%. This suggests that wholesale improvements are needed to reach the target of 100% of citizens having access to e-medical records. However, 62% of the population sought health information online compared to an EU27 average of 56%, suggesting that demand for online access to medical records could be strong.³⁰

National Recovery and Resilience Plans (NRRPs)

Part of the up to around €0.1bn funding linked to the digitalisation of healthcare within the NRRP includes support for the development of e-medical records. The NRRP does not appear to make an explicit commitment to the development of e-IDs, however the target is likely to be supported by the broader investment targeting the digitalisation of public services.

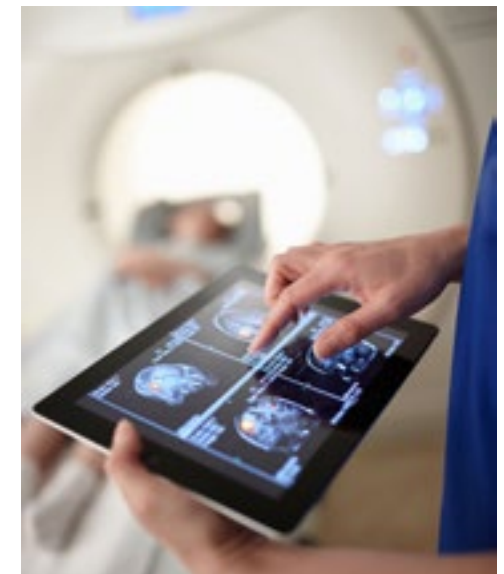


Administrative steps related to major life events that can be done online (%)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression.

* Linear projection may overestimate the likely outcome given the percentage has remained relatively flat over the last two years.



France

Overview of the plans and progress against targets

Around 25% of France's total NRRP funding has been allocated to digital transformation. Of this amount up to around €22.1bn appears to be linked to Digital Decade targets across the four areas. Achieving the targets will require a significant improvement in particular across Infrastructure, Skills and Business areas.



Infrastructure



Skills



Businesses



Public services

Progress against targets



VHCN household coverage

- 44% France (2020)
- 44% EU (2020)
- 100% Target (2030)



Basic digital skills

- 57% France (2020)
- 58% EU (2020)
- 80% Target (2030)



ICT specialists (million)

- 1.22 France (2020)
- 3.01 Target (2030)



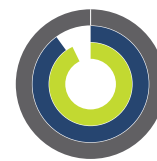
Basic digital intensity

- 57% France (2019)
- 60% EU (2019)
- 90% Target (2030)



Cloud adoption

- 15% France (2020)
- 18% EU (2020)
- 75% Target (2030)



Online services completion

- 93% France (2020)
- 90% EU (2020)
- 100% Target (2030)

Commentary and NRRP commitments

France is in line with the EU27 average in terms of VHCN coverage, with 44% of households covered in 2020.

There appears to be up to around €0.9bn of funding in total linked to the digital decade targets to support the development of 5G and gigabit connectivity.

France is broadly in line with the EU27 average in terms of basic digital skills with 57% of the population equipped with at least a basic level of digital skills in 2020. The number of ICT specialists has been increasing gradually to 1.22 million but is still less than half the target level of 3.01 million.

There is up to around €13.1bn in total linked to enhancing the digital skills of the population and promoting the development of ICT specialists to achieve the Digital Decade targets.

France is slightly behind the EU27 average in terms of the share of SMEs covered with basic digital intensity. The share of enterprises using cloud computing is following an upward trend, but remains far behind the EU target.

There is up to €5.2 funding within the NRRP linked to supporting the digitalisation of enterprises (including specifically for SMEs) and the take-up of cloud computing.

France has historically been above the EU27 average in terms of general use of online services and in 2020 was 7 percentage points away from the EU target.

Up to around €0.8bn of funding has been linked to the digitalisation of public services, with a further up to €2bn to improve the technical standards of the digital health, including the provision of e-medical records. There is also up to around €0.1bn linked to supporting the provision of e-IDs.

France

Infrastructure

Up to around €0.9bn of funding is linked to supporting rollout of very high capacity networks (fibre and 5G), but France will need to continue on the current trajectory to achieve the target, which may prove challenging.



Gigabit connectivity

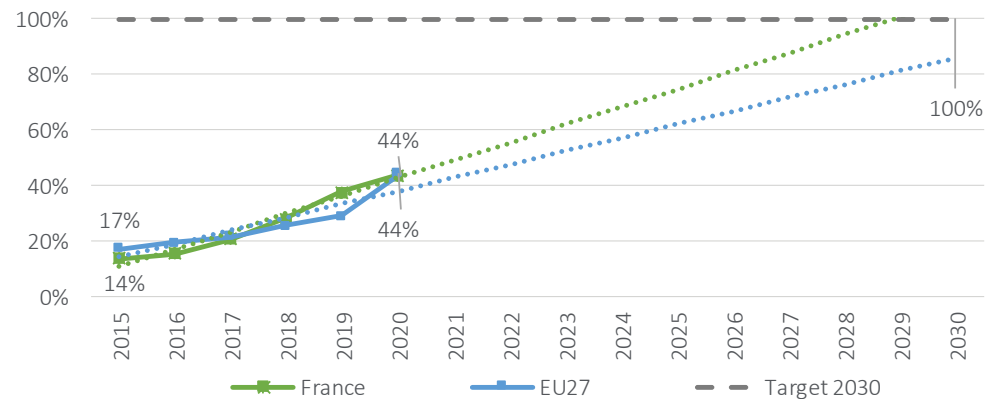
Current trend

France has broadly tracked the EU27 average in terms of VHCN coverage, with 44% of households covered in 2020. Based on an illustrative projection to 2030, using a simple linear forecast based on historic data from 2015 to 2020, it is expected that France will meet the EU target by 2030. However, the trend does not account for the additional commercial and operational challenges posed in particular when deploying networks to the final 10-20 percent of households which may slow down the rate at which coverage increases (e.g. higher cost per home passed in less populated areas).

National Recovery and Resilience Plans (NRRPs)

Up to around €0.6bn of funding is contained within France's broadband strategy which aims to amplify new network infrastructure deployments generation (NGA) capable of delivering gigabit connectivity.

VHCN (% of households covered)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression.

a) Some, if not all, of the 5G deployments that have been announced are understood to be based on non-standalone (NSA) architecture, which may not deliver the full extent of network performance and features (e.g. ultra low latency), required to enable the full extent of 5G use cases. 5G Standalone (SA) deployments are expected to deliver this but are likely to require significant additional investment.

5G coverage in populated areas

Current trend

France has taken steps towards enabling 5G by awarding 33% of harmonised 5G spectrum by the end of 2020.³¹

4G population coverage in France had reached 99% by the end of 2020.³² As of December 2020, four operators are understood to have undertaken initial 5G deployments in some areas of France; Orange France launched its commercial 5G in 15 municipalities, Bouygues Telecom switched on its 5G network in 20 major cities and targets nationwide coverage by the end of 2021, SFR launched its 5G service in the city of Nice and Free became the fourth operator to launch commercial 5G services in December, and reported covering 40% of the population.^{33 a}

National Recovery and Resilience Plans (NRRPs)

There is up to around €0.3bn of funding linked to support the deployment of 5G networks. The "5G and future telecommunications network technologies" strategy aims to develop French telecom network solutions while developing 5G.

France

Skills

Up to around €13.1bn has been linked to helping achieve the skills targets, however achieving the targets is going to require a significant increase in the number of ICT specialists and people with basic digital skills.

Adult basic digital skills

Current trend

The share of adults with at least basic digital skills has grown gradually in France over the last five years, and has been broadly in line with the EU27 average. In 2020, 57% of the population was equipped with basic digital skills, leaving France 43 percentage points behind the EU target.

National Recovery and Resilience Plans (NRRPs)

Key components of the up to around €13.0bn funding linked to the digital decade targets include strengthening digital skills of the population (€0.8bn), ICT training courses (€0.8bn) and training of young people in the digital sectors (€5.1bn).

ICT specialists

Current trend

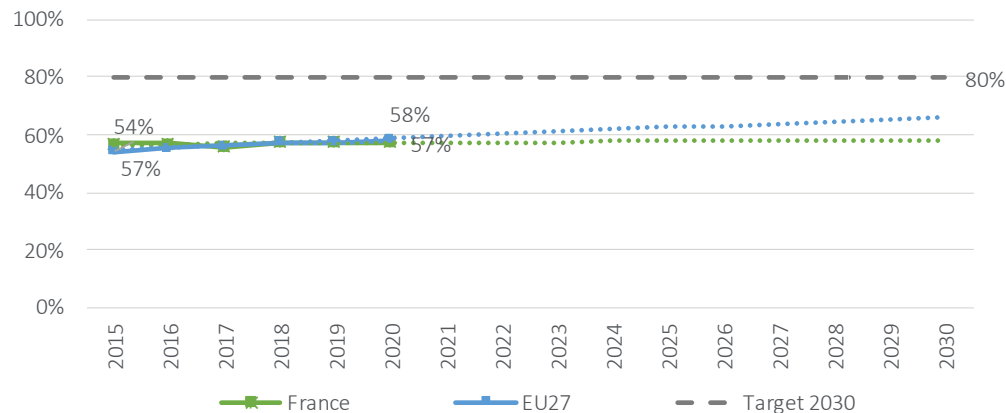
The number of ICT specialists has been increasing gradually in France in the last five years from 0.91 million in 2015 to 1.22 million in 2020. Nevertheless, in order to achieve the EU target, France will need to train or attract 1.79 million more ICT specialists, more than double the current level.

National Recovery and Resilience Plans (NRRPs)

There is up to around €0.1bn of funding to support the development of ICT specialists, which includes granting access to doctoral training targeted at engineers and BAC +5 employees.^a

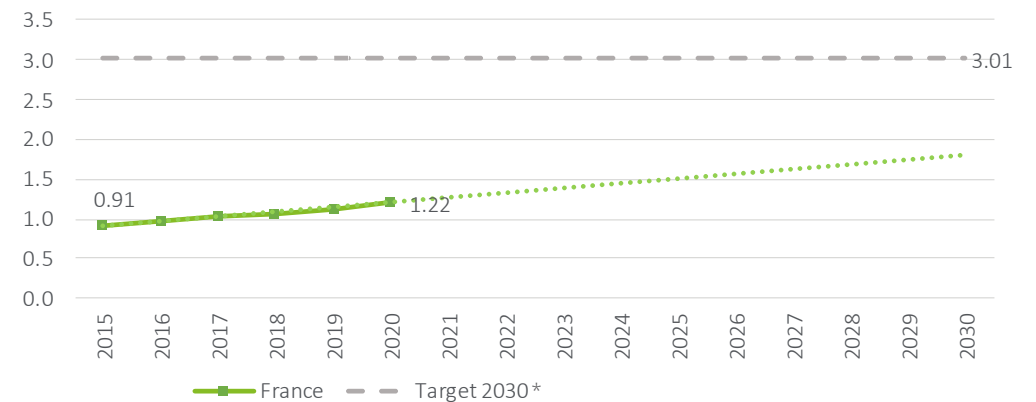
a) [BAC+5](#) is the equivalent to a Master's degree in the UK. The number +5 refers to the years of study after the baccalaureat.

Individuals with at least basic digital skills (% of 16-74 population)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

Number of ICT specialists (millions)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression.

* The Member State share of the total EU ICT specialists target (20m) has been apportioned based on population share

France

Businesses

France has linked up to around €5.2bn of funding to promoting the digitalisation of businesses, but a significant increase in levels of digital intensity and adoption of cloud computing services is required to meet targets.

Digital intensity of SMEs

Current trend

The share of SMEs in France with at least a basic digital intensity has grown from 53% in 2015 to 57% in 2019 and is slightly below the EU27 average. Achieving the target will require a significant increase in the proportion of SMEs using digital tools given France was around 33 percent points below the target in 2019.

National Recovery and Resilience Plans (NRRPs)

The NRRP outlines the proposed actions to enhance digital intensity of SMEs with a total of up to €3.1bn linked to achieving the basic digital intensity target. Key elements of the funding include the digital upgrade of VSEs, SMEs and ETIs (€0.4bn), Bpifrance^a innovation aid intended for SMEs (around €2bn for 2021-2023) and investments in advanced technologies for all enterprises (€0.4bn).

a) [Bpifrance](#) is a financial institution providing financing and aid to innovative companies.

Businesses using Cloud computing

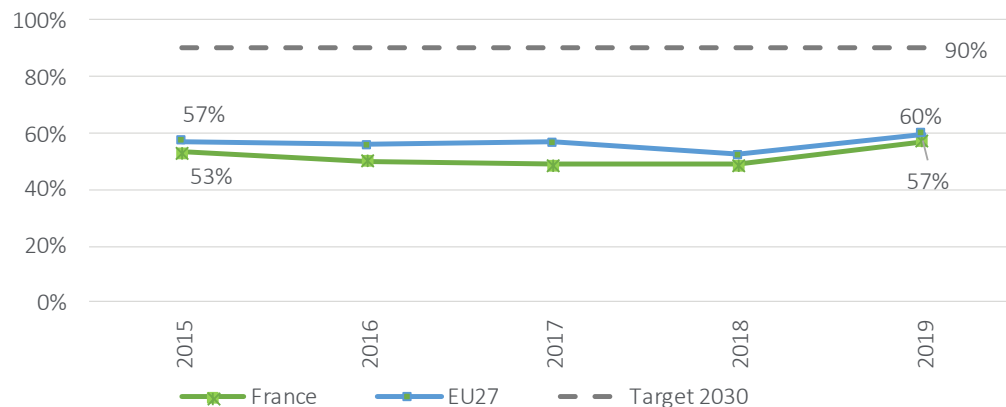
Current trend

Adoption of cloud computing services by businesses in France has broadly been in line with the EU27 average (for the years that data is available), and in 2020 was just below the EU27 average (15% vs 18%).

National Recovery and Resilience Plans (NRRPs)

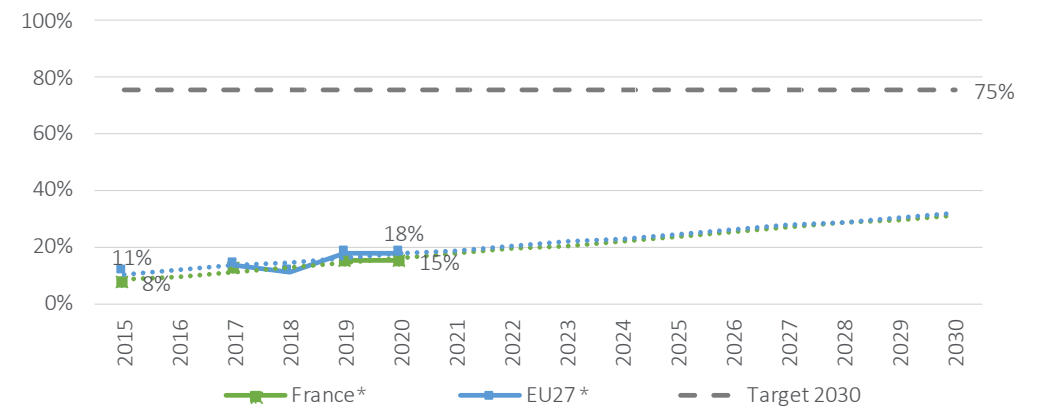
There is funding of up to around €2.1bn linked to cloud computing and related services including investments in modernisation of the aeronautics sector (i.e. automated software processes) (€1.8bn) and the cloud strategy (€0.3bn) supporting the development of key digital markets.

SMEs with at least a basic level of digital intensity (%)



Source: Eurostat (DII), Deloitte analysis.

Businesses purchasing advanced cloud computing services (%)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression
* Missing data for years 2016 and 2018 for France and for 2016 for EU

France



Public services

Up to around €0.8bn of the NRRP funds in France have been linked to the digitalisation of public services, with a further €2.1bn linked to improve the technical standards of digital health, including the provision of e-medical records and supporting the provision of e-IDs. France appears on track to meet the 2030 target for online public services provided it can maintain the growth in online usage.



Online public services

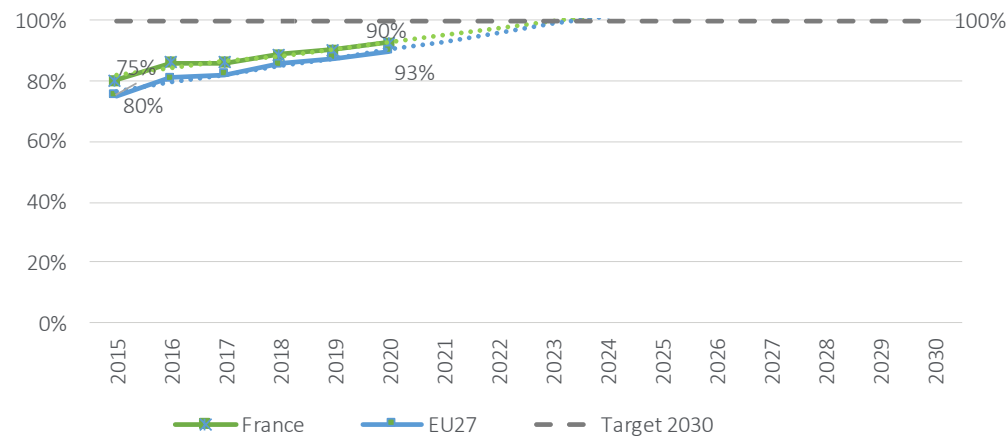
Current trend

France has historically been above the EU27 average, with online public services completion at 93% in 2020, compared to the EU27 average of 90%. The consistent upward trend of public services provided online suggests that France is on track to achieving the EU 2030 target.

National Recovery and Resilience Plans (NRRPs)

As part of up to around €0.8bn funding for the provision of key public services, the NRRP outlines investments for the digital upgrading of the state (€0.5bn), cybersecurity (€0.1bn) and teleworking of the ministry of interior (€0.1bn).

Administrative steps related to major life events that can be done online (%)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

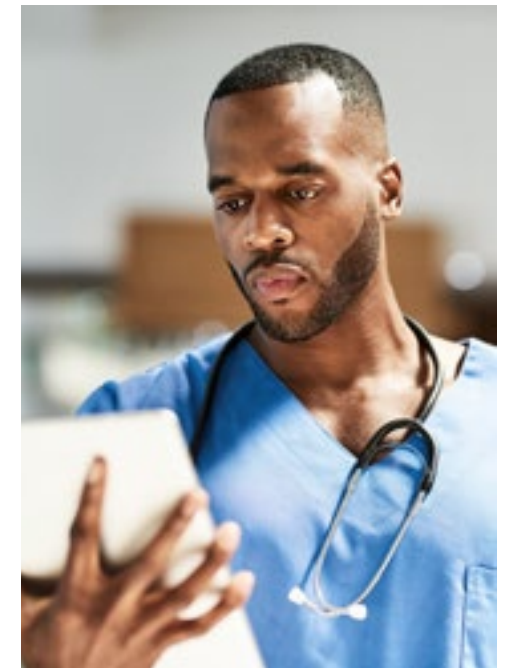
E-medical records and e-IDs

Current trend

Data for the current availability of e-medical records is not available for France, however considering other related measures, such as seeking health information online (50% vs 53% EU27 average in 2019) and making appointments online (25% vs 18% EU27 average in 2018), France is broadly on track with the EU27 average. Yet further improvements are needed to reach the target of 100% of citizens having access to e-medical records.³⁴

National Recovery and Resilience Plans (NRRPs)

France has designated up to €2.0bn in funding to catch up with the technical standards of digital health and a further €0.1bn for the development of e-IDs.



Germany

Overview of the plans and progress against targets

Around 50% of Germany's total NRRP funding has been allocated to digital transformation. Of this amount up to around €10.5bn is linked to Digital Decade targets across the four areas. Achieving the targets will require significant increases in VHCN coverage, the number of ICT specialists, and cloud adoption.



Infrastructure



Skills



Businesses



Public services

Progress against targets



VHCN household coverage

- 33% Germany (2020)
- 44% EU (2020)
- 100% Target (2030)



Basic digital skills

- 70% Germany (2020)
- 58% EU (2020)
- 80% Target (2030)



ICT specialists (million)

- 2.02 Germany (2020)
- 3.72 Target (2030)



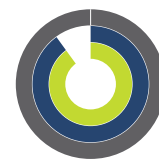
Basic digital intensity

- 67% Germany (2019)
- 60% EU (2019)
- 90% Target (2030)



Cloud adoption

- 12% Germany (2020)
- 18% EU (2020)
- 75% Target (2030)



Online services completion

- 90% Germany (2020)
- 90% EU (2020)
- 100% Target (2030)

Commentary and NRRP commitments

Germany has historically been below the EU27 average in terms of VHCN coverage, however has managed to reduce the gap in recent years. 5G rollout is relatively well advanced, with the three largest mobile operators expected to reach between 35% and 80% 5G population coverage by the end of 2021.

Within the NRRP there is up to around €1.5bn in total linked to the development of high-speed capacity broadband networks and technologies such as 5G and 6G.

Germany has relatively high levels of digital literacy with 70% of adults already equipped with basic digital skills, compared to the EU27 average of 58%. In terms of ICT specialists, the number has been following an upward trend in recent years however, achieving the target will require training of an additional 1.7 million ICT specialists.

The NRRP outlines investments of up to around €1.8bn in total linked to support the development of basic digital skills and ICT specialists.

Digital intensity across businesses is higher compared to the EU27 average, leaving Germany around 23 percentage points away from the target. The adoption of cloud computing increased between 2015 and 2020, however reaching the target by 2030 will require a significant acceleration in cloud adoption.

Germany has proposed a total of up to around €2.9bn funding that is linked to the digital intensity and cloud adoption targets.

Germany tracks the EU27 average in terms of online service completion and is 10 percentage points away from the target.

Germany has linked up to around €3.3bn of funding to the digital upgrade of public services with further €0.8bn to support the development of e-medical records and €0.2bn for e-IDs.

Germany

Infrastructure

Germany is relatively well advanced in terms of 5G coverage and is making progress towards the VHCN coverage target but with a significant gap left to close; Up to around €1.5bn of funding has been linked to supporting further rollout of VHCNs and 5G.



Gigabit connectivity

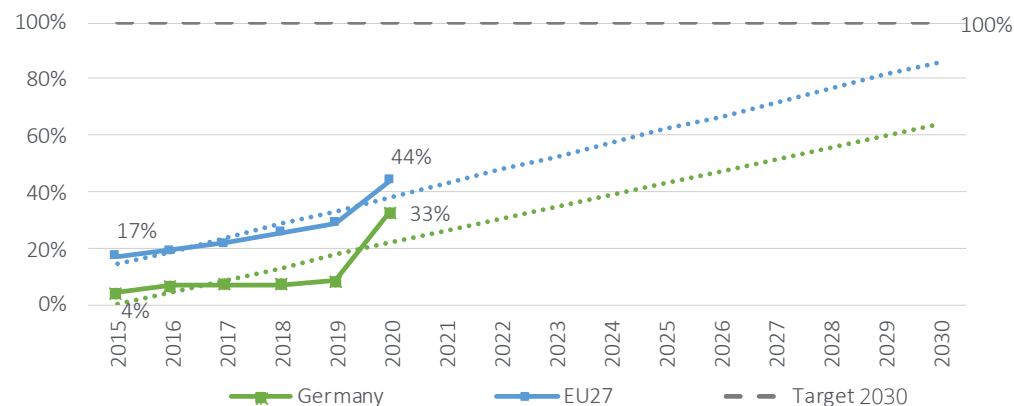
Current trend

Germany's VHCN coverage expanded from 9% of households covered in 2019 to 33% in 2020 but remains below the EU27 average. Whilst continuing on this trajectory would lead to Germany reaching the target, in practice there are likely to be commercial and operational barriers that could pose challenges to continuing at this rate (e.g. relatively high cost per premises and operational challenges associated with deployment in rural areas). Achieving the target will require significant investment and support in addressing these barriers.

National Recovery and Resilience Plans (NRRPs)

Up to around €1.5bn funding linked to VHCN commitments to developing high-speed capacity broadband networks and backhaul includes networks.

VHCN (% of households covered)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

5G coverage in populated areas

Current trend

Germany has already assigned 67% of harmonized 5G spectrum by the end of 2020 – the highest rate in the EU.³⁵

4G population coverage in Germany had reached 94% by the end of 2020³⁶. In terms of 5G coverage, Germany is relatively well advanced compared to the EU27 average and appears to be progressing well towards the EU target. The first commercial deployments were reported to have taken place in 2019 and MNOs have announced coverage targets. For example, Deutsche Telekom announced plans to cover 80% of the population by the end of 2021; Vodafone announced plans to provide coverage to 30 million people in Germany by the end of 2021; Telefonica indicated that it expects to reach around 50% of the population by the end of 2022 and the whole country by 2025.^{a 37}

National Recovery and Resilience Plans (NRRPs)

As part of the same €1.5bn funding linked to network infrastructure, the NRRP includes resources to enhance future technologies in communications such as 5G, 6G and OpenRAN.

a) Some, if not all, of the 5G deployments that have been announced are understood to be based on non-standalone (NSA) architecture, which may not deliver the full extent of network performance and features (e.g. ultra low latency), required to enable the full extent of 5G use cases. 5G Standalone (SA) deployments are expected to deliver this but are likely to require significant additional investment.

Germany

Skills

Across a number of packages related to digital skills, a total of up to around €1.8bn has been linked to achieving the EU targets, however achieving targets will require a 10 percentage point increase in the proportion of people with basic digital skills and a significant increase in the number of ICT specialists.

Adult basic digital skills

Current trend

Germany is significantly ahead of the EU27 average, with 70% of the adult population already having basic digital skills. Reaching the target will require an acceleration in the proportion of the population with basic digital skills over the next few years, to close the 10 percentage point gap to the target.

National Recovery and Resilience Plans (NRRPs)

Within Germany's plans, up to around €1.8bn of funding is linked to the development of digital skills including building an education platform to support development of digital skills (€0.6bn), enhancing the digital skills of teachers (€0.2bn) and supporting the development of digital skills at schools through the use of digital media (€0.5bn).

ICT specialists

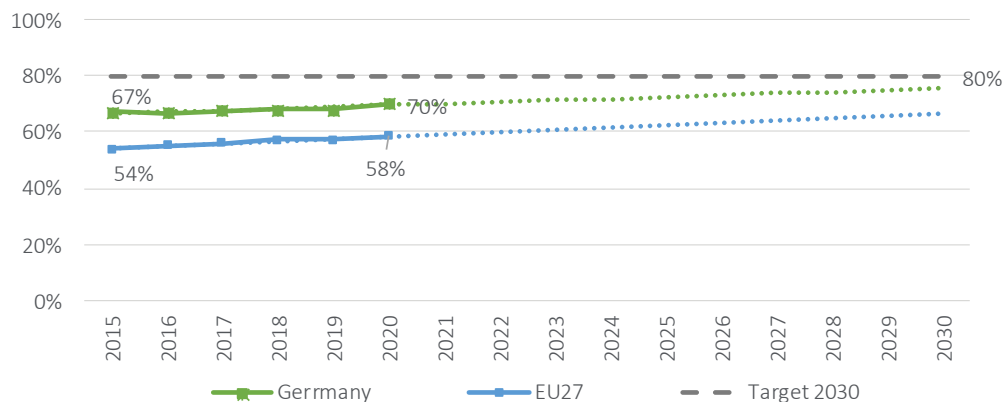
Current trend

The number of ICT specialists increased by more than a third between 2015 and 2020, reaching 2.02 million by 2020. However, to meet the EU target, a further 1.7 million ICT specialists will be needed by 2030, which is likely to require significant funding and support to train or attract more specialists.

National Recovery and Resilience Plans (NRRPs)

The NRRP proposes investments linked to the training of ICT specialists with a total value of up to around €0.1bn, including supporting programmes for PhD students in data science and supporting the development of skills in science subjects.

Individuals with at least basic digital skills (% of 16-74 population)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

Number of ICT specialists (millions)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

* The Member State share of the total EU ICT specialists target (20m) has been apportioned based on population share

Germany

Businesses

Germany's plans include up to around €2.9bn of funding linked to supporting the significant increase in SMEs digitalisation and cloud computing adoption that is required to reach the EU targets by 2030.

Digital intensity of SMEs

Current trend

The proportion of SMEs with a basic level of digital intensity in Germany is above the EU27 average, but growth has been limited in recent years. If the historic trend over the last five years persists then the EU target may not be met, meaning funding and support may be required to reach the target.

National Recovery and Resilience Plans (NRRPs)

There is funding of up to around €2.1bn linked to the digitalisation of enterprises, through the creation of innovation clusters (€0.2bn) and digitalisation of the automotive sector (€1.9bn) including digitalisation of production processes and business models.

Businesses using Cloud computing

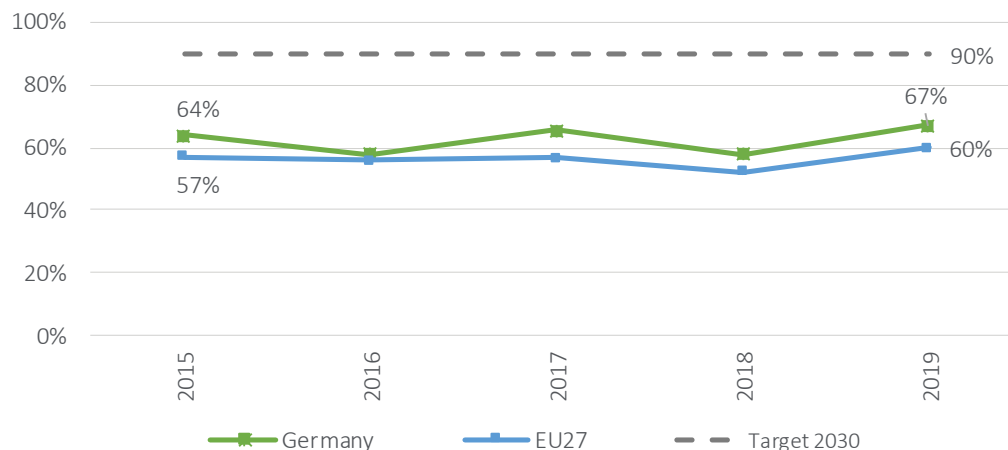
Current trend

The level of cloud computing adoption by businesses in Germany is below the EU27 average, with 12% of businesses purchasing these services in 2020 compared to the EU27 average of 18%. Achieving the target by 2030 will require a significant acceleration in the rate of adoption over the period.

National Recovery and Resilience Plans (NRRPs)

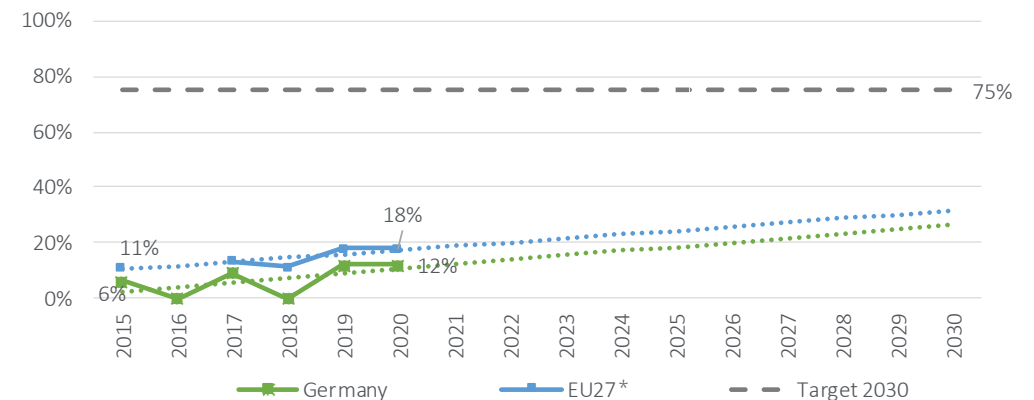
The NRRP sets out up to around €0.8bn in funding linked to the development of cloud competences and cloud platforms through the IPCEI (Important Project of Common European Interest) next generation of cloud infrastructure and service package.

SMEs with at least a basic level of digital intensity (%)



Source: Eurostat (DII), Deloitte analysis.

Businesses purchasing advanced cloud computing services (%)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

* Missing data for 2016 for EU

Germany



Public services

Germany appears on track to reach the online public services EU target, but has a wide gap to close on the e-medical records target; Up to around €4.3bn of funding is linked to public services, e-medical records and e-IDs.

Online public services

Current trend

Germany is closely aligned to the EU27 average in terms of the proportion of administrative steps related to major life events that can be actioned online. Achieving the 2030 target appears feasible, though there may be broader unfulfilled potential for digitalisation of public services.

National Recovery and Resilience Plans (NRRPs)

The NRRP outlines investments of up to around €3.3bn linked to the digitalisation of public services through investments in the digitalisation of administrative processes (€3bn), modernisation of the registration process (€0.3bn) and digitalisation of the pension system (€0.03bn).

E-medical records and e-IDs

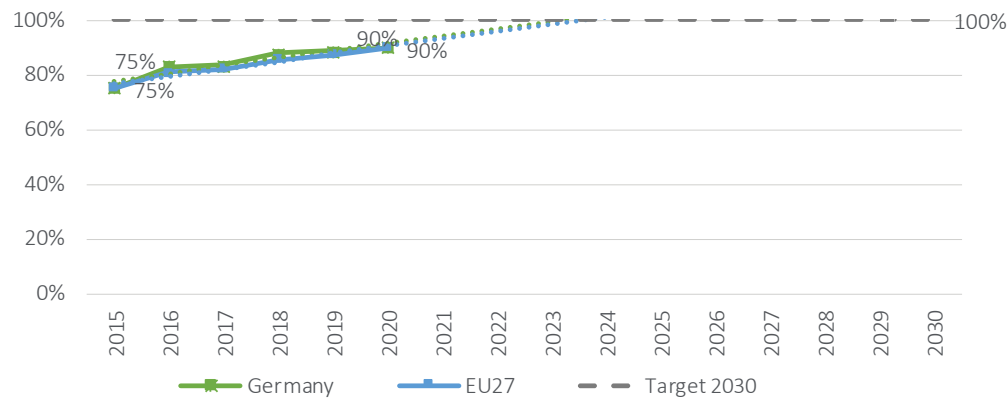
Current trend

Only 3% of individuals in Germany accessed personal health records online in 2020, compared to an EU27 average of 10%, indicating that further investments are needed to reach the target of 100% of citizens having access to e-medical records. 70% of the country sought health information online compared to an EU27 average of 56%, which may suggest a relatively high level of demand for online access to medical records and related information and services.³⁸

National Recovery and Resilience Plans (NRRPs)

There is funding of up to around €0.8bn for the digitalisation and strengthening of the healthcare system covering a nationwide expansion of electronic reporting and a further €0.2bn of funding to support the development of a European identity system.

Administrative steps related to major life events that can be done online (%)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression



Greece

Overview of the plans and progress against targets

Around 25% of Greece's total NRRP funding has been allocated to digital transformation, of which up to around €4.5bn is linked to Digital Decade targets. Achieving these will require significant improvements, especially in Infrastructure, Skills and Business areas.



Infrastructure



Skills



Businesses



Public services

Progress against targets



VHCN household coverage

- 7% Greece (2020)
- 44% EU (2020)
- 100% Target (2030)



Basic digital skills

- 51% Greece (2020)
- 58% EU (2020)
- 80% Target (2030)



ICT specialists (million)

- 0.08 Greece (2020)
- 0.48 Target (2030)



Basic digital intensity

- 32% Greece (2019)
- 60% EU (2019)
- 90% Target (2030)



Cloud adoption

- 7% Greece (2020)
- 18% EU (2020)
- 75% Target (2030)



Online services completion

- 84% Greece (2020)
- 90% EU (2020)
- 100% Target (2030)

Commentary and NRRP commitments

Greece lags significantly behind the EU27 average in terms of VHCN coverage, with 7% coverage in 2020. Based on the current level of coverage and trajectory, achieving the EU target by 2030 is likely to be challenging and require significant investment in network infrastructure.

Within Greece's plans, up to around €0.6bn in total has been linked to 5G and fibre rollout and network infrastructure.

The share of adults with basic digital skills has historically been below the EU27 average, however the gap has been closing in recent years. Whilst the number of ICT specialists has grown gradually in recent years, if Greece is to achieve the EU target, it will need a sixfold increase in the current number of specialists by 2030.

Across a range of packages related to digital skills, up to around €1.8bn in the NRRP has been linked to achieving the Skills targets.

Both the digital intensity of SMEs and cloud adoption by enterprises is significantly lower in Greece compared to the EU27 average. The digital intensity of SMEs appears to have fallen in recent years, further widening the gap with the rest of the EU27.

Within the plans there is up to around €0.5bn linked to supporting the digital transformation of SMEs, while funding does not appear to be explicitly linked to achieving cloud adoption targets.

Greece lags behind the EU27 average in terms of online service completion, however it has managed to reduce the gap in recent years.

There is up to around €0.8bn in funding linked to the online provision of public services target with a further up to €0.9bn for e-medical records and up to €0.04bn for e-IDs.

Greece

Infrastructure

Up to around €0.6bn of funding in total is linked to supporting the rollout of very high capacity networks (fibre and 5G), however VHCN coverage in Greece is one of the lowest in the EU and achieving the target will require a significant increase in the rate of network rollout and the investment to support it.

Gigabit connectivity

Current trend

Greece currently lags significantly behind the EU27 average for VHCN coverage, with 7% of households covered in 2020, compared to the EU27 average of 44%. Based on its current position, achieving the target of 100% coverage by 2030 is likely to be very challenging and require significant levels of investment in network infrastructure over the coming years.

National Recovery and Resilience Plans (NRRPs)

Within Greece's plans, up to around €0.3bn of funding is linked to supporting the development of new industrial parks (€0.1bn), fibre optic infrastructure in buildings (€0.1bn) and submarine fibre cables (€0.03bn).

5G coverage in populated areas

Current trend

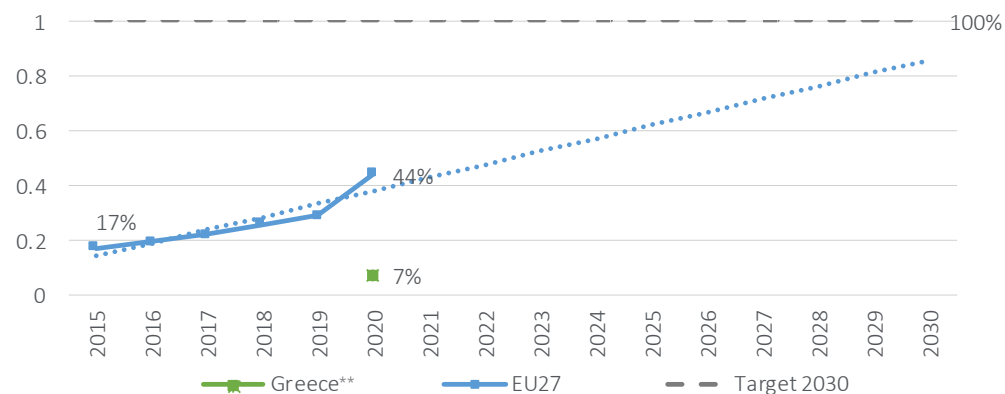
4G population coverage in Greece had reached 97% by the end of 2020.³⁹ As of January 2021, three mobile operators had announced that they had switched on their 5G networks; Wind Hellas is understood to cover the two largest cities of Athens and Thessaloniki and aims to exceed 60% of population coverage within three years, Cosmote expanded coverage to 90% of the population of the two largest cities in March 2021 and Vodafone Greece aims to cover 40% of the population of the same two cities by March 2022.^{a 40}

National Recovery and Resilience Plans (NRRPs)

There is funding of up to around €0.3bn linked to 5G deployment in the NRRP, with investments such as 5G wireless network infrastructure development on Greek highways that are part of the Trans-European Transport Networks (€0.2bn) and 5G infrastructure along routes of natural and cultural interest to tourists (€0.03bn).



VHCN (% of households covered)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression
 ** Missing data for Greece prior to 2020

a) Some, if not all, of the 5G deployments that have been announced are understood to be based on non-standalone (NSA) architecture, which may not deliver the full extent of network performance and features (e.g. ultra low latency), required to enable the full extent of 5G use cases. 5G Standalone (SA) deployments are expected to deliver this but are likely to require significant additional investment.

Greece

Skills

Across a number of packages related to digital skills, a total of up to around €1.8bn has been linked to achieving the EU targets; however achieving targets will require a 29 percentage point increase in the proportion of people with basic digital skills and a more than fivefold increase in the number of ICT specialists.

Adult basic digital skills

Current trend

Greece has historically been below the EU27 average in terms of the proportion of adults with basic digital skills, but has started to reduce the gap in recent years with 51% of the population equipped with at least basic digital skills, compared to the EU27 average of 58%. In order to achieve the target, Greece will need to increase the proportion of people with basic digital skills by 29 percentage points by 2030.

National Recovery and Resilience Plans (NRRPs)

Greece has committed up to around €1.7bn of funding to support the development of digital skills such as a new strategy for lifelong skills, including digital skills (€1bn), digital transformation of education (€0.4bn) and digital training of elderly and vulnerable people. (€0.2bn).

ICT specialists

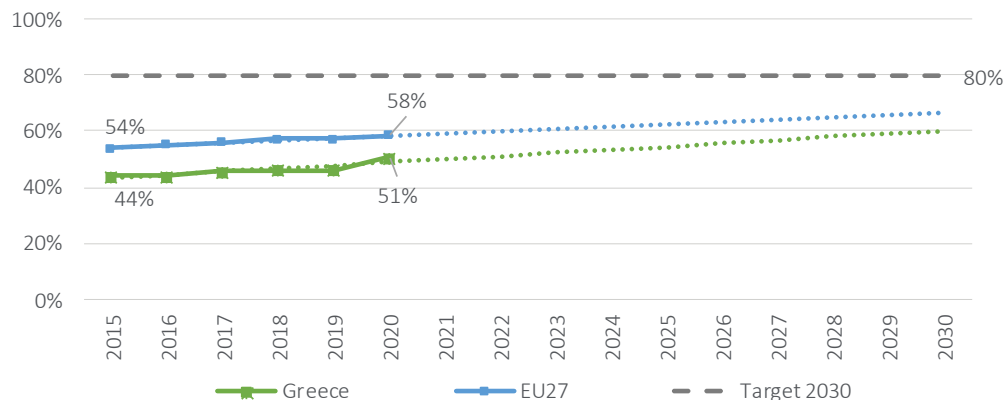
Current trend

Whilst the number of ICT specialists in Greece has increased by 20,000 (c. 30%) in the last five years to around 80,000 in 2020, it remains well below the implied Digital Decade target of around 480,000. If Greece is to achieve the target it will need to train or attract 400,000 additional ICT specialists, nearly six times the current number of ICT specialists in the country.

National Recovery and Resilience Plans (NRRPs)

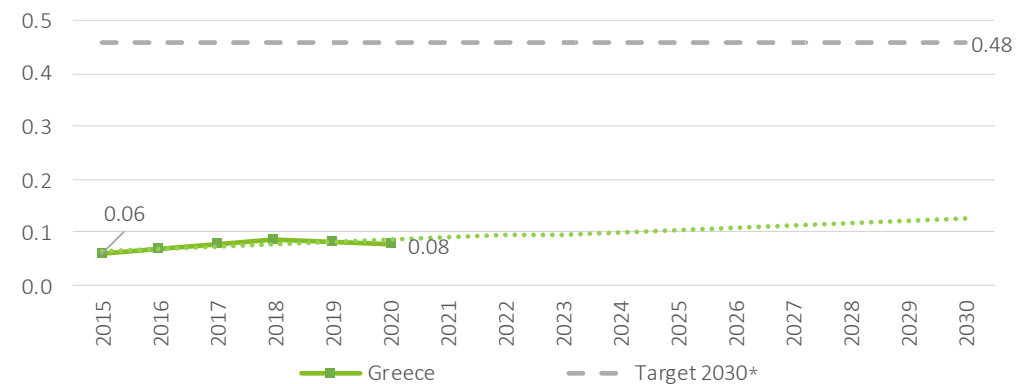
There is up to around €0.1bn of funding linked to providing basic and applied research aid for the establishment of a Research and Innovation Institute focussed on AI, data processing and algorithm development and participation in digital technologies and Euro-HPC (High Performance Computing).

Individuals with at least basic digital skills (% of 16-74 population)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

Number of ICT specialists (millions)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

* The Member State share of the total EU ICT specialists target (20m) has been apportioned based on population share

Greece

Businesses

Within the plans there is up to around €0.5bn linked to supporting the digital transformation of SMEs, but Greece has one of the lowest levels of SME digitalisation and cloud adoption in the EU and will need to make significant improvements to achieve the targets by 2030.

Digital intensity of SMEs

Current trend

The share of SMEs with at least a basic digital intensity in Greece appears to have declined sharply from 46% in 2015 to 32% in 2019, further widening the gap with the EU27 average. Greece will need to reverse this trend and make significant strides improving SME's digital adoption if it is to achieve the EU target by 2030.

National Recovery and Resilience Plans (NRRPs)

Within the plans there is up to around €0.5bn linked to the SME digitalisation target, which includes investments towards the digital transformation of SMEs (€0.4bn), acceleration of smart manufacturing (€0.1bn) and digital transformation of the agri-food sector (€0.05bn).

Businesses using Cloud computing

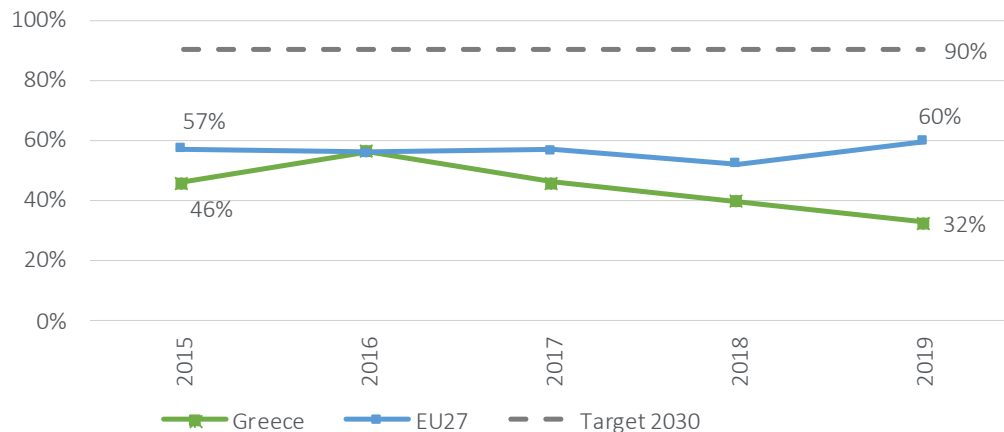
Current trend

Adoption of relatively advanced cloud services among Greek businesses is below the EU27 average (7% vs 18%) and has increased by 2 percentage points since 2015, meaning the gap has widened further in recent years. Achieving the target will require a significant acceleration in the rate of cloud service adoption (compared to the historic trend).

National Recovery and Resilience Plans (NRRPs)

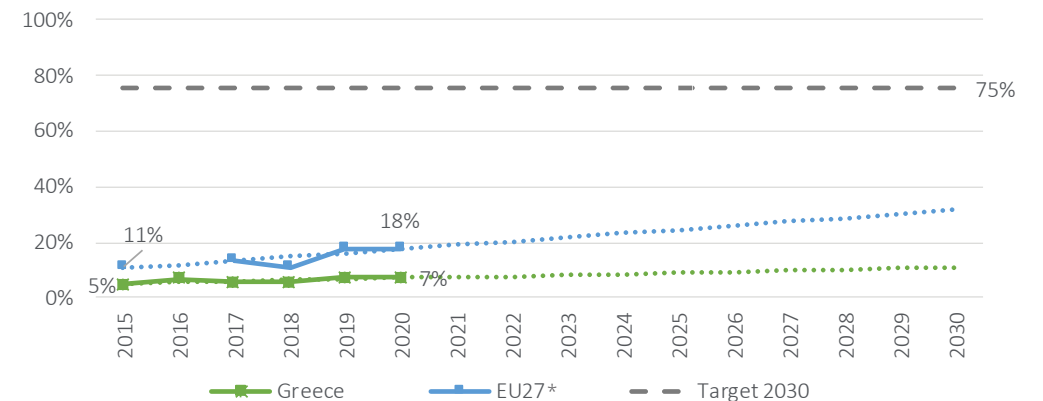
The NRRP does not make explicit commitments towards the adoption of cloud computing services, however, cloud computing could form part of the broader SME digitalisation commitments.

SMEs with at least a basic level of digital intensity (%)



Source: Eurostat (DII), Deloitte analysis.

Businesses purchasing advanced cloud computing services (%)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

* Missing data for 2016 for EU

Greece



Public services

Up to around €0.8bn of the NRRP funds in Greece have been linked to the digitalisation of public services, with a further €0.9bn to e-medical records and e-IDs. Despite being below the EU27 average, Greece appears on track to meet the 2030 target for online public services provided it can maintain the growth in online usage.

Online public services

Current trend

General use of online services in Greece has increased significantly from 48% in 2015 to 84% in 2020, almost closing the gap with the EU27. The current trend leaves Greece 16 percentage points away from the target, and if historic growth continues, then it will potentially be on track to meet the target before 2030.

National Recovery and Resilience Plans (NRRPs)

As part of the up to around €0.8bn funding for the provision of key public services, the NRRP outlines investments for the digital transformation of the tax and customs administration (€0.2bn), digital transformation of justice (€0.1bn) and web services development (€0.1bn).

E-medical records and e-IDs

Current trend

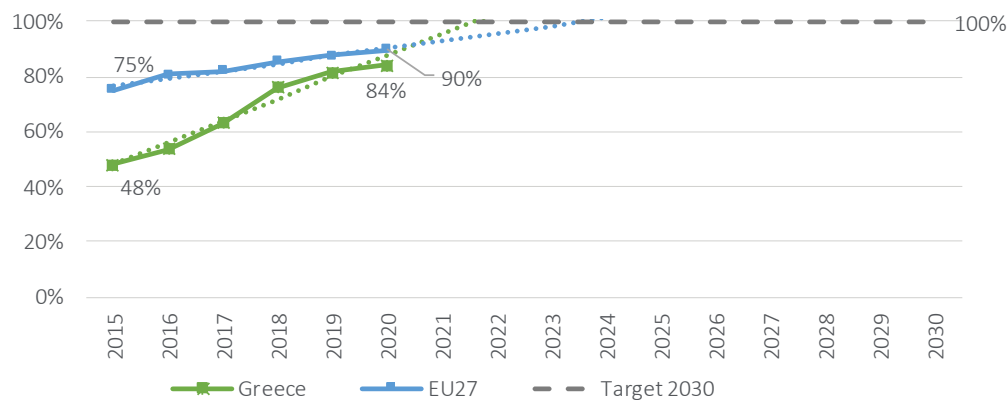
Greece lags behind the EU27 average, with 6% of individuals having accessed personal health records online in 2020, compared to an EU27 average of 10%. It also lags behind the EU27 on related measures, such as seeking health information online (52% vs 56% EU27 average) and making appointments online (8% vs 21% EU27 average).⁴¹

Achieving the target of 100% of citizens having access to e-medical records will require significant investments over the next years.

National Recovery and Resilience Plans (NRRPs)

Greece has linked up to around €0.9bn of funding to the e-medical record targets including commitments to digitalise archives and related services (€0.6bn) and the digital transformation of health (€0.3bn). The NRRP further proposes €0.04bn of funding for the digital transformation of the immigration and asylum system which may contribute to the development of e-IDs.

Administrative steps related to major life events that can be done online (%)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression



Hungary

Overview of the plans and progress against targets

Around 23% of Hungary's total NRRP funding has been allocated to digital transformation. Of this amount up to around €1.4bn is linked to Digital Decade targets. Achieving these will require a significant improvement, in particular across Infrastructure, Skills and Businesses.^a



Infrastructure



Skills



Businesses



Public services

Progress against targets



VHCN household coverage

- 43% Hungary (2020)
- 44% EU (2020)
- 100% Target (2030)



Basic digital skills

- 49% Hungary (2020)
- 58% EU (2020)
- 80% Target (2030)



ICT specialists (million)

- 0.17 Hungary (2020)
- 0.44 Target (2030)



Basic digital intensity

- 42% Hungary (2019)
- 60% EU (2019)
- 90% Target (2030)



Cloud adoption

- 11% Hungary (2020)
- 18% EU (2020)
- 75% Target (2030)



Online services completion

- 87% Hungary (2020)
- 90% EU (2020)
- 100% Target (2030)

Commentary and NRRP commitments

Hungary tracks the EU27 average in terms of VHCN coverage, with 43% household coverage in 2020 (57 percentage points below the target), while 5G deployments are in the early stages. Achieving both targets will likely require significant network investment over the coming years.

The NRRP does not appear to make explicit spending commitments to support 5G or VHCN deployment but there is funding with its NBP.

Digital literacy has historically been lower compared to the EU27 average, with the gap widening in recent years. The number of ICT specialists increased by 20,000 across 2015-2020, however the number of ICT specialists will need to more than double to meet the EU target by 2030.

The NRRP proposes up to around €1.3bn of funding linked to the development of digital skills, but with no explicit mention of ICT specialists.

Digital intensity across businesses is lower compared to the EU, with the gap widening in recent years. Adoption of cloud computing services is increasing gradually, however significant improvements are required to meet the EU target.

Funding of up to around €5 million in the NRRP is linked to the digitalisation of enterprises, with no explicit reference to cloud computing.

Hungary has historically had relatively low levels of online service completion but this has increased significantly from 45% in 2015 to 87% in 2020, suggesting that it is on course to meet the EU target.

The NRRP has linked up to around €0.1bn to the digitalisation of public services.

a) Estimate derived by converting local currency to Euros using exchange rate of 353.65 HUF /Euro as at 01/06/21.

Hungary

Infrastructure

Hungary's VHCN coverage has been increasing in recent years and 5G has been launched commercially, but achieving the EU targets will require significant investment. The NRRP does not appear to explicitly link funding to reaching either target.



Gigabit connectivity

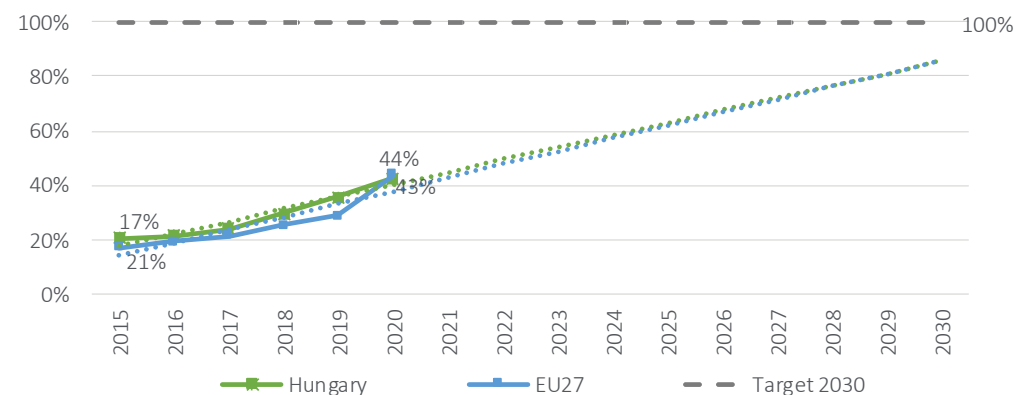
Current trend

VHCN coverage has increased steadily in Hungary and is now at 43%, very close to the EU27 average. Achieving 100% coverage by 2030 may still require incremental steps, particularly to support deployment in areas where the commercial incentives are weakest.

National Recovery and Resilience Plans (NRRPs)

The NRRP does not make any explicit funding commitments towards the deployment of VHCNs in Hungary. There is however around €250 million of funding to support network infrastructure build within Hungary's national broadband plans.⁴²

VHCN (% of households covered)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

5G coverage in populated areas

Current trend

Hungary has already assigned 61% of harmonized 5G spectrum by the end of 2020, which is among the highest in the EU.⁴³

4G population coverage in Hungary had reached 97% by the end of 2020.⁴⁴ In terms of 5G coverage, the first commercial deployments are understood to have taken place in 2019 and MNOs have indicated that there is 5G coverage in some cities. For example, Vodafone announcing in March 2021 that its 5G network was available 'in most of Budapest' and Magyar Telekom reaching parts of 18 cities and towns.^{a 45}

National Recovery and Resilience Plans (NRRPs)

The NRRP makes brief reference to 5G based solutions as part of wider investment packages, however there is no specific funding commitments towards 5G deployment.

a) Some, if not all, of the 5G deployments that have been announced are understood to be based on non-standalone (NSA) architecture, which may not deliver the full extent of network performance and features (e.g. ultra low latency), required to enable the full extent of 5G use cases. 5G Standalone (SA) deployments are expected to deliver this but are likely to require significant additional investment.

Hungary



Up to around €1.3bn has been linked to helping achieve the skills targets, however achieving the targets will require a significant increase in the number of ICT specialists and people with basic digital skills.

Adult basic digital skills

Current trend

Around half of adults have at least basic digital skills. This is below the EU27 average and has not increased since 2015. This trend suggests that policy measures that support digital skills development may be required if Hungary is to reach the EU target.

National Recovery and Resilience Plans (NRRPs)

There is up to around €1.3bn of funding within the NRRP that is linked to supporting the development of digital skills, with a strong focus on digital skills for students. Part of the funding includes investments to integrate digital educational solutions into everyday educational practice and to support the development of vocational digital curriculum.

ICT specialists

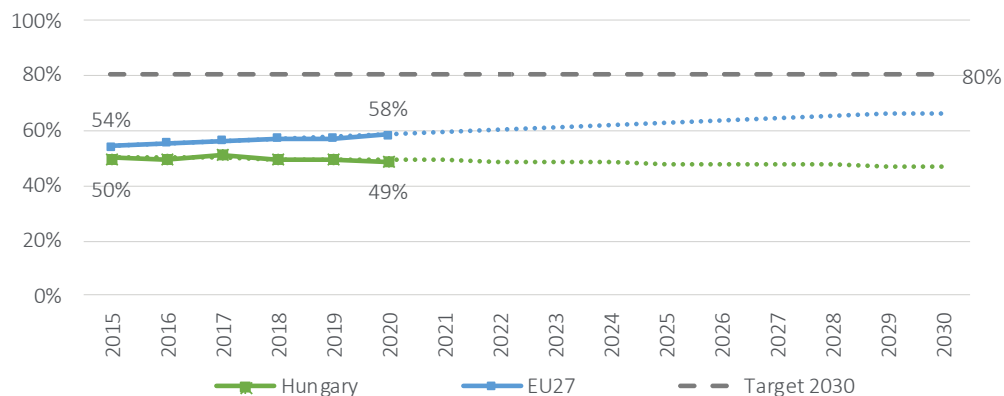
Current trend

The number of ICT specialists has been broadly stable over the last five years and in 2020 was around 40% of the EU target level (for 2030). To achieve the EU target Hungary will need to more than double the number of ICT specialists by 2030 which will likely require significant investment in education and training.

National Recovery and Resilience Plans (NRRPs)

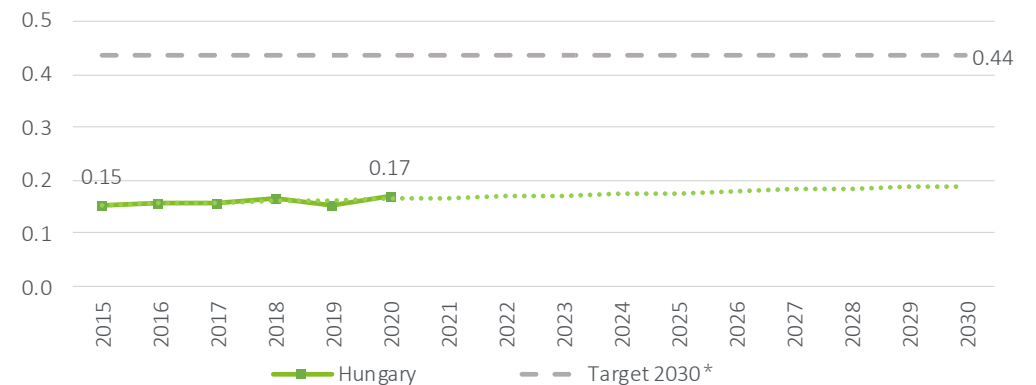
The NRRP does not appear to commit funds to the training of ICT specialists, however wider investment packages supporting the development of digital skills may help support Hungary's progression towards the target.

Individuals with at least basic digital skills (% of 16-74 population)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

Number of ICT specialists (millions)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

* The Member State share of the total EU ICT specialists target (20m) has been apportioned based on population share

Hungary

Businesses

A significant increase in levels of digital intensity and adoption of cloud computing services is required to meet the EU targets. Around €5 million of funding appears to be linked to promoting the digitalisation of SMEs with nothing explicitly linked to supporting adoption of cloud services.

Digital intensity of SMEs

Current trend

Digital intensity among SMEs is relatively low compared to the EU27 average, with 42% reaching at least a basic level in 2019. Achieving the target will require a significant increase in SME digitalisation (around a 48 percentage point increase compared to 2020) in the coming years.

National Recovery and Resilience Plans (NRRPs)

Within Hungary's plans, up to around €5 million of funding is linked to strengthening the digital intensity of SMEs by providing aid and training for the acquisition of intangible assets such as software rights and IT solutions, and enabling SME participation in business and public procurements.

Businesses using Cloud computing

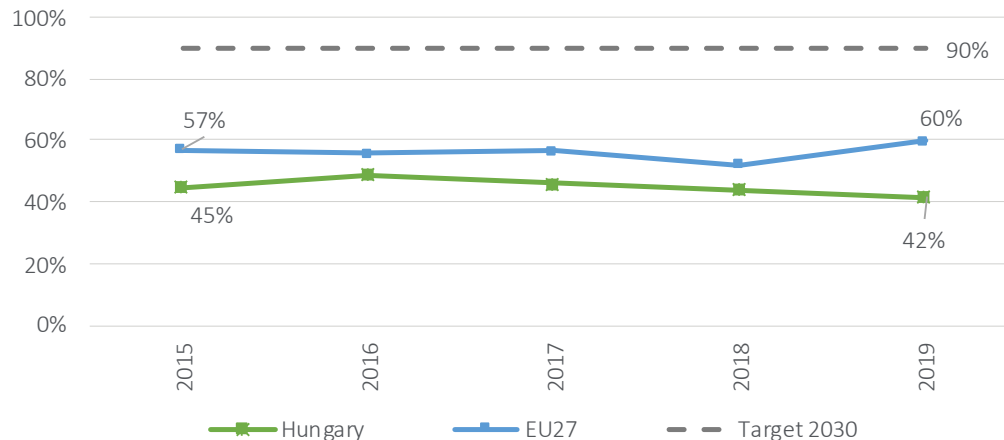
Current trend

In Hungary 11% of businesses were reported to have purchased cloud services in 2020, below the EU27 average of 18%. Achieving the EU target will require a significant increase (of around 64 percentage points) in levels of adoption, highlighting the potential need for measures to support cloud adoption.

National Recovery and Resilience Plans (NRRPs)

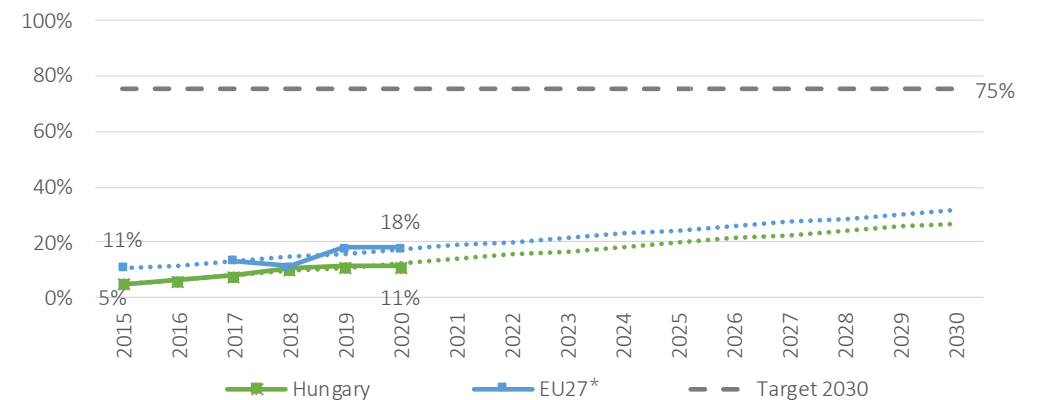
The NRRP does not appear to propose funding commitments linked to the adoption of cloud computing, however this might be covered indirectly through broader funding outside of the NRRP.

SMEs with at least a basic level of digital intensity (%)



Source: Eurostat (DII), Deloitte analysis.

Businesses purchasing advanced cloud computing services (%)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression
*Missing data for 2016 for EU

Hungary



Public services

Hungary appears on track to meet the 2030 target for online public services provided it can maintain the growth in online usage; Up to around €0.1bn of the NRRP funds in Hungary have been linked to the digitalisation of public services.

Online public services

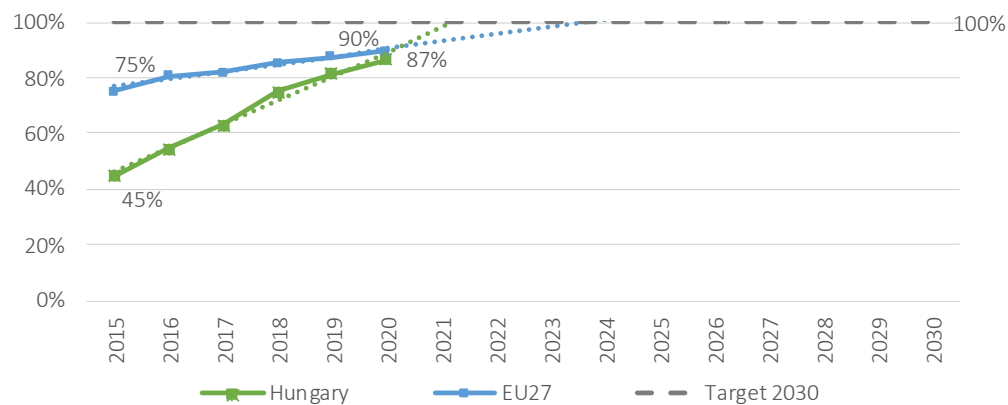
Current trend

General use of online services in Hungary has increased significantly from 45% in 2015 to 87% in 2020, almost closing the gap with the EU27 average. The current trend leaves Hungary 13 percentage points away from the target, and if historic growth continues, it will potentially be on track to meeting the target before 2030.

National Recovery and Resilience Plans (NRRPs)

There is funding of up to around €0.1bn linked to the use of online public services, including the extension of automatic administrative decision making system and the development of a national IT asset management to increase the efficiency of public services.

Administrative steps related to major life events that can be done online (%)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

E-medical records and e-IDs

Current trend

Around 17% of individuals in Hungary were reported to have accessed personal health records online in 2020, compared to an EU27 average of 10%.⁴⁶ Achieving the target of e-medical records for the entire population is likely to require significant further investment to support the transition over the coming years.

National Recovery and Resilience Plans (NRRPs)

The NRRP outlines funding committed to the digitalisation of health care, however there is no reference to e-medical records or digitalisation of related databases. However, the transition to digital e-medical records and e-IDs may still be supported through the broader digitalisation plans without specific spending commitments linked to these targets.



Italy

Overview of the plans and progress against targets

Around 27% of Italy's total NRRP funding has been allocated to digital transformation. Of this amount up to around €43.3bn appears to be linked to Digital Decade targets across the four areas. Achieving the targets will require a significant improvement, in particular across Infrastructure, Skills and Business areas.



Infrastructure



Skills



Businesses



Public services

Progress against targets



VHCN household coverage

- 30% Italy (2020)
- 44% EU (2020)
- 100% Target (2030)



Basic digital skills

- 42% Italy (2020)
- 58% EU (2020)
- 80% Target (2030)



ICT specialists (million)

- 0.83 Italy (2020)
- 2.67 Target (2030)



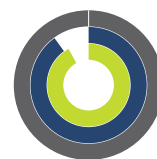
Basic digital intensity

- 58% Italy (2019)
- 60% EU (2019)
- 90% Target (2030)



Cloud adoption

- 15% Italy (2020)
- 18% EU (2020)
- 75% Target (2030)



Online services completion

- 92% Italy (2020)
- 90% EU (2020)
- 100% Target (2030)

Commentary and NRRP commitments

Italy currently lags significantly behind the EU27 average for VHCN coverage, and the gap has widened in recent years. Up to around €6.7bn of funding has been linked to support VHCNs, based on a technology-neutral approach. The NRRP includes an ambition to meet the Digital Divide target by 2026.

Achieving this ambition will require a significant increase in the historic rate of network updates, and the associated investment required to deliver this.

Italy has relatively low levels of digital literacy compared to the EU27 average, while its number of ICT specialists is below the implied Digital Decade target level for the country. Digital literacy rates have increased gradually in recent years but would need to be nearly doubled if the target is to be met.

Across a number of packages related to digital skills, a total of up to around €14.6bn in the NRRP has been linked to achieving the Skills targets.

Digital intensity across businesses has improved in recent years, closing the gap to the EU27 average. However, adoption of relatively sophisticated cloud services remains low at 15%, below the EU27 average and 60 percentage points below the 2030 target.

Italy has designated up to around €14.7bn of funding to promoting the digitalisation of businesses, consisting of both investments and tax credits.

General use of online services in Italy is broadly in line with the EU27 average.

Up to around €3.8bn has been allocated to digitalisation of public services, and a further up to around €1.4bn to e-medical records. The plan also sets an aim to reinforce the digital identity regime as part of a wider €2bn package for digital services and citizenship. In total this amounts to up to around €7.2bn.

Italy

Infrastructure

Up to around €6.7bn of funding is linked to supporting the rollout of very high capacity network and 5G networks together, however achieving the target will require a significant increase in the rate of network rollout.



Gigabit connectivity

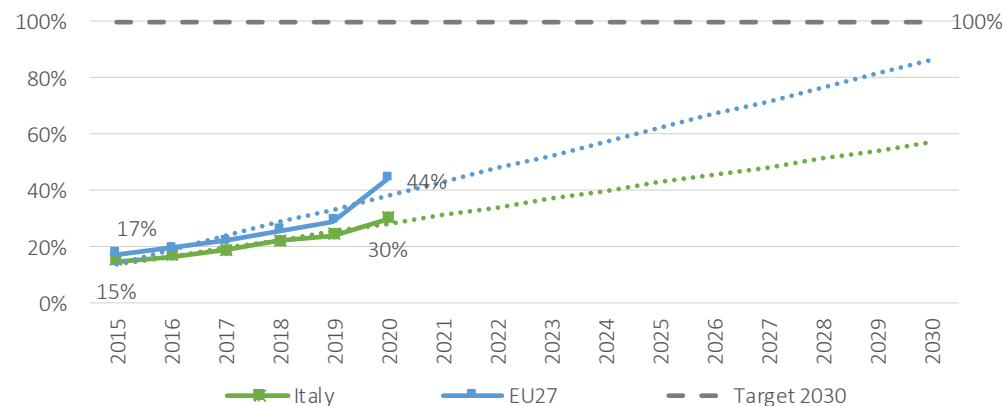
Current trend

Italy lags significantly behind the EU27 average for VHCN coverage, with the gap widening in recent years (30% compared to the 44% EU27 average). If the rate of VHCN deployment were to continue on the current trajectory, Italy would remain significantly below the target by 2030. Achieving the target will therefore require a significant acceleration.

National Recovery and Resilience Plans (NRRPs)

Italy has set an ambition to meet the Digital Divide target ahead of schedule, with gigabit connections across the entire country by 2026. There is up to around €6.7bn of funding within the NRRP linked to VHCNs including resources to bring gigabit connectivity to 8.5 million families and businesses (as well as to accelerate 5G deployment).

VHCN (% of households covered)*



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

5G coverage in populated areas

Current trend

Italy has taken significant steps towards enabling 5G, having awarded 60% of harmonised 5G spectrum as at the end of 2020.⁴⁷

4G population coverage in Italy reached 97% by the end of 2020.⁴⁸ The first commercial 5G deployments is understood to have taken place in 2019 and all four operators are reported to have switched on 5G in some areas by the end of 2020, with plans to extend coverage. For example, Telecom Italia is reported to be planning to cover 120 cities by the end of 2021, while Wind Tre reported that its 5G network has achieved 74% population coverage.^{b 49}

National Recovery and Resilience Plans (NRRPs)

As part of the same €6.7bn funding linked to network infrastructure, the NRRP includes resources to incentivise development of 5G infrastructure in areas where there may not be a commercial incentive to deploy 5G. This includes targeting 5G coverage across more than 2,000 km of key transport corridors and 10,000 km of roads.

a) VHCN coverage post-2020 is a projection based the assumption that network deployment rates continue at the historic average deployment rate (linear growth assumed). This does not take account of other factors that may affect the rate and profile of network deployment over time;

b) Some, if not all, of the 5G deployments that have been announced are understood to be based on non-standalone (NSA) architecture, which may not deliver the full extent of network performance and features (e.g. ultra low latency), required to enable the full extent of 5G use cases. 5G Standalone (SA) deployments are expected to deliver this but are likely to require significant additional investment.

Italy

Skills

Across a number of packages related to digital skills, a total of up to around €14.6bn has been linked to improving digital skills, however achieving targets will require almost a doubling of the number of people with basic digital skills and nearly three times the number of ICT specialists.

Adult basic digital skills

Current trend

Italy has historically been below the EU27 average, with a majority of the population currently not having basic digital skills. This may reflect, among other things, the fact that Italy's population has the highest median age across the EU27⁵⁰. Achieving the target will require almost a doubling in the proportion of people with basic digital skills by 2030 and a significant increase in the current rate at which these skills are obtained.

National Recovery and Resilience Plans (NRRPs)

There is up to around €13.6bn of funding linked to digital skills which includes ITS courses for all students (€ 1.5bn), development of digital skills at schools (€ 1.1bn), active labour policies and training for vulnerable groups (€ 4.4bn) and connected learning environments in schools (€2.1bn).

ICT specialists

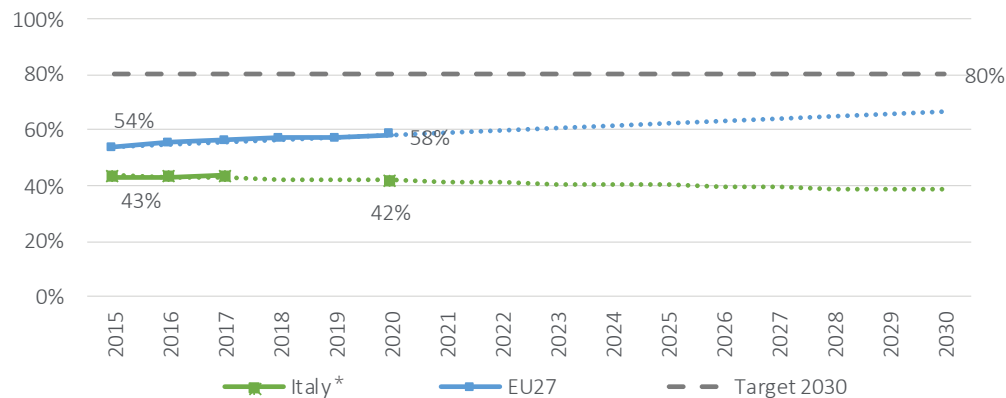
Current trend

The number of ICT specialists in Italy has increased by around 100,000 (14%) since 2015, but it remains well below the implied Digital Decade target of c.2.7 million. Achieving the target will require around 1.8 million additional ICT specialists to be trained, nearly twice the current number of ICT specialists in the country.

National Recovery and Resilience Plans (NRRPs)

Up to around €1bn of investment within the NRRP includes funding to enhance high-profile competencies for key enabling technologies (€0.6bn) and increase doctorates by 3000 in STEM subjects (€0.4bn).

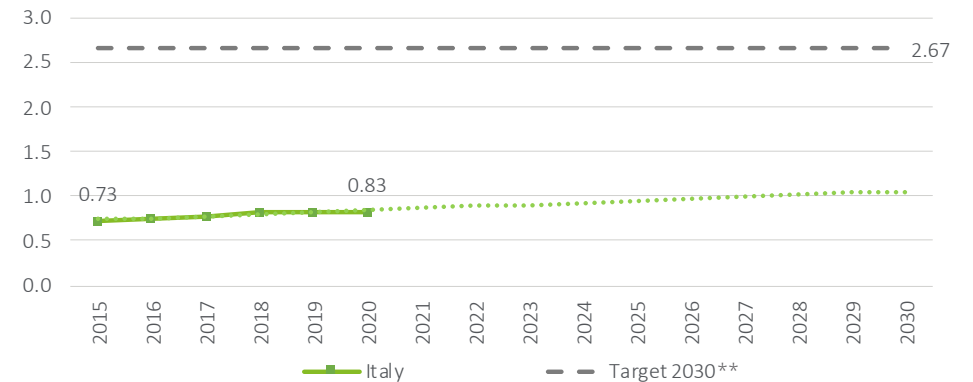
Individuals with at least basic digital skills (% of 16-74 population)*



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

* Missing data for year for 2018 – 2019 for Italy. Individuals with at least basic digital skills post-2020 is a projection based the assumption that digital skills adoption continue at the historic average rate (linear growth). This does not take account of other factors that may affect the rate and profile of over time.

Number of ICT specialists (millions)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

** The Member State share of the total EU ICT specialists target (20m) has been apportioned based on population share

Italy

Businesses

Italy has linked up to around €14.7bn of funding to promoting the digitalisation of businesses, the highest funding linked to the business targets across the 20 countries. However, a significant increase in levels of digital intensity and adoption of cloud computing services is required to meet targets.

Digital intensity of SMEs

Current trend

Italy has historically been below the EU27 average, however it has managed to significantly reduce the gap in recent years. Yet to achieve the EU target, the share of SMEs with at least a basic level of digital intensity has to increase by 32 percentage points.

National Recovery and Resilience Plans (NRRPs)

Italy's plans contain up to around €14.6bn linked to supporting digitalisation of businesses (including SMEs), which consists of tax breaks to encourage investment in digital assets (€13.4bn), as well as commitments to supply advanced technological and innovative services to companies (€0.4bn) and digital systems that will support digitalisation in the logistics and transport sectors (€0.3bn).

Businesses using Cloud computing

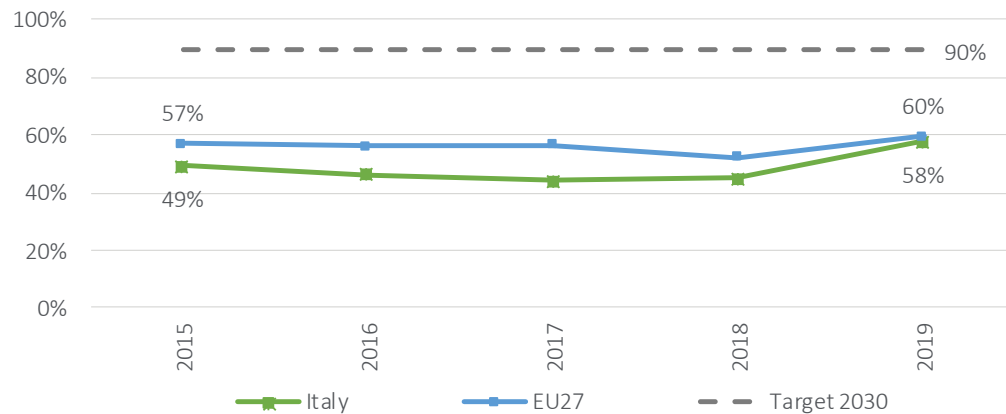
Current trend

Adoption of relatively advanced cloud services among Italian businesses is marginally below the EU27 average and has increased by 3 percentage points since 2017.

National Recovery and Resilience Plans (NRRPs)

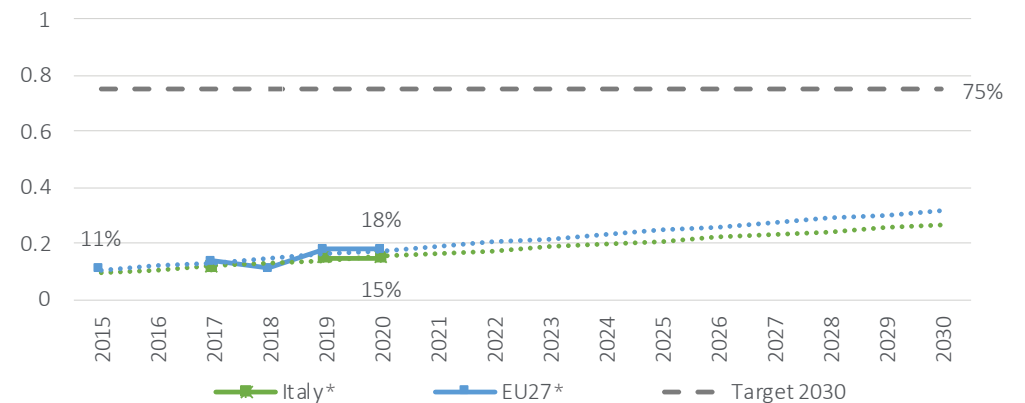
The plan contains funding of up to around €0.1bn linked to cloud computing and related services includes the development of cloud infrastructure for airport systems.

SMEs with at least a basic level of digital intensity (%)



Source: Eurostat (DII), Deloitte analysis.

Businesses purchasing advanced cloud computing services (%)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression
 * Missing data for years 2016 and 2018 for Italy and for 2016 for EU

Italy



Public services

Up to around €3.8bn of the NRRP funds in Italy have been linked to the digitalisation of public services, with a further up to around €1.4bn to e-medical records and up to around €2bn to e-IDs. Italy appears on track to meet the 2030 target for online public services provided it can maintain the growth in online usage.

Online public services

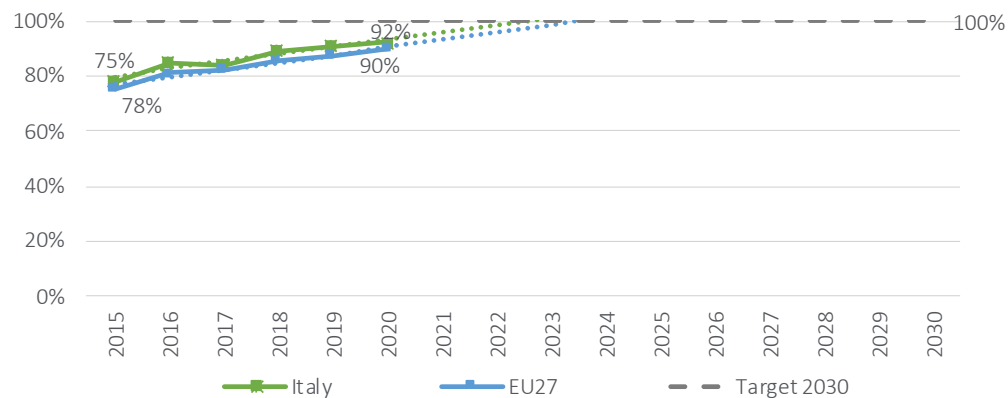
Current trend

General use of online services in Italy is broadly in line with the EU27 average over time. The consistent upward trend of public services provided online suggests that Italy is on track to achieving the EU 2030 target.

National Recovery and Resilience Plans (NRRPs)

Up to around €3.8bn of the NRRP funds in Italy have been linked to the digitalisation of public services. Key components of the €3.8bn include digitalisation of large central administrations (€0.6bn), migration of public administration to cloud (€0.9bn), development of a national data platform (€0.7bn) and electronic equipment and applications used for the provision of critical services (€0.7bn).

Administrative steps related to major life events that can be done online (%)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

E-medical records and e-IDs

Current trend

Italy lags behind the EU27 average, with 8% of individuals having access to personal health records online in 2020, compared to an EU27 average of 10%. It also lags behind the EU27 on related measures, such as seeking health information online (46% vs 56% EU27 average) and making appointments online (12% vs 21% EU27 average).⁵¹ The current trend suggests that significant improvements are required to achieve the target and enable the provision of e-records for the entire population.

National Recovery and Resilience Plans (NRRPs)

The plan includes up to around €1.4bn linked to digitalisation of health records. The plan sets an aim to reinforce the digital identity regime, building on existing systems but converging towards an integrated solution for users. This is one of the elements of a wider up to around €2bn package for digital services and digital citizenship.



Poland

Overview of the plans and progress against targets

Around 22% of Poland's total NRRP funding has been allocated to digital transformation. Of this amount up to around €7.5bn is linked to Digital Decade targets. Achieving these will require improvement in all areas, in particular Infrastructure, Skills and Businesses.



Infrastructure



Skills



Businesses



Public services

Progress against targets



VHCN household coverage

- 60% Poland (2020)
- 44% EU (2020)
- 100% Target (2030)



Basic digital skills

- 44% Poland (2020)
- 58% EU (2020)
- 80% Target (2030)



ICT specialists (million)

- 0.55 Poland (2020)
- 1.70 Target (2030)



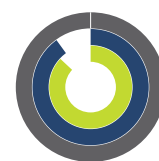
Basic digital intensity

- 38% Poland (2019)
- 60% EU (2019)
- 90% Target (2030)



Cloud adoption

- 7% Poland (2020)
- 18% EU (2020)
- 75% Target (2030)



Online services completion

- 87% Poland (2020)
- 90% EU (2020)
- 100% Target (2030)

Commentary and NRRP commitments

Poland's VHCN coverage is significantly above the EU27 average, with 60% of households covered in 2020. If coverage continues to be extended at the current rate, Poland would be on track to achieve the 2030 target, however extending coverage to more remote areas may prove more challenging.

There appears to be up to around €2.6bn funding linked to the digital decade targets to support the development of 5G and gigabit connectivity.

Poland has relatively low levels of digital literacy compared to the EU27 average (44% vs 58%). Digital literacy rates remain around 36 percentage points below the EU target.

Poland needs to increase the number of ICT specialists threefold by 2030 if it is to achieve the EU target. There is up to around €1.9bn linked to enhancing the digital skills of the population to achieve the target, but no explicit reference to ICT specialists.

Digital intensity across businesses is lower compared to the EU27 average, with the gap widening in recent years. The share of enterprises using cloud computing is following an upward trend, but remains far behind the EU target (7% vs 75%).

Poland has linked up to around €1.6bn of funding to supporting SME digitalisation and the adoption of cloud computing services.

General use of online services in Poland is broadly in line with the EU27 average, with 87% online service completion in 2020.

Up to around €0.4bn of funding has been linked to the digitalisation of public services, with a further up to around €1bn to supporting the development of e-medical records.

Poland

Infrastructure

Poland is progressing well towards the VHCN coverage target, with around 60% of households covered in 2020, and there is up to around €2.6bn linked to supporting further rollout of VHCNs and 5G infrastructure.

Gigabit connectivity

Current trend

Poland's VHCN coverage has increased significantly in recent years from 7% in 2015 to 60% in 2020, and is now above the EU27 average. Based on this trend, Poland appears on track to achieving the target before 2030. However deploying networks to the remaining households can still pose significant commercial and operational challenges, in particular rolling out to rural areas, which may slow down the rate of network deployment.

National Recovery and Resilience Plans (NRRPs)

There is up to around €1.2bn worth of funding within the NRRP that is linked to providing access to very fast internet in the areas of white spots (digitally excluded areas with no or inadequate coverage).

5G coverage in populated areas

Current trend

4G population coverage in Poland had reached 99% by the end of 2020.⁵² MNOs reported launching 5G services in some areas over the course of 2020.^{a 53}

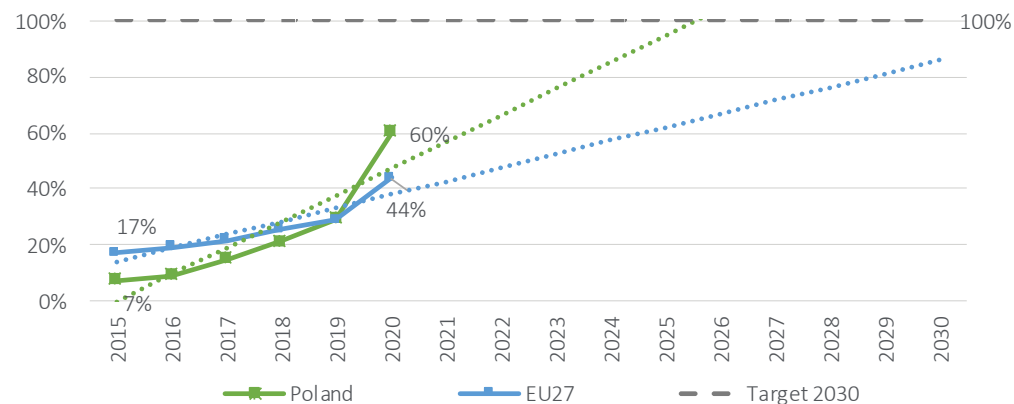
According to the '5G Strategy Poland', 700 MHz spectrum will be deployed to provide 5G coverage in transport paths in Poland by 2025. Other spectrum bands identified for 5G are due to be awarded in 2021. The 5G strategy for Poland will be funded by public and community funds until 2023.⁵⁴

National Recovery and Resilience Plans (NRRPs)

The NRRP outlines a set of reforms and investments to support the deployment of 5G including proposed reforms to increase the availability of wired and wireless connectivity and potential investments of up to around €1.4bn for the deployment of 5G networks.



VHCN (% of households covered)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

a) Some, if not all, of the 5G deployments that have been announced are understood to be based on non-standalone (NSA) architecture, which may not deliver the full extent of network performance and features (e.g. ultra low latency), required to enable the full extent of 5G use cases. 5G Standalone (SA) deployments are expected to deliver this but are likely to require significant additional investment.

Poland

Skills

Up to around €1.9bn has been linked to helping achieve the digital skills target, however the plan does not make explicit commitments to supporting the training of ICT specialists. Achieving both targets is going to require a significant increase in the number of ICT specialists and people with basic digital skills.

Adult basic digital skills

Current trend

The proportion of adults with basic digital skills in Poland has increased gradually over the last five years from 40% in 2015 to 44% in 2020, but has remained well below the EU27 average of 58% in 2020. Achieving the EU target by 2030 will require more than an additional third of the population to become equipped with basic digital skills by 2030.

National Recovery and Resilience Plans (NRRPs)

Key components of the up to around €1.9bn funding towards digital skills include support for the development of modern vocational education and transfer of new technologies (€0.4bn), e-competence to raise the level of digital competencies (€0.2bn) and the use of IT solutions at a greater intensity to allow students to develop digital skills (€0.6bn).

ICT specialists

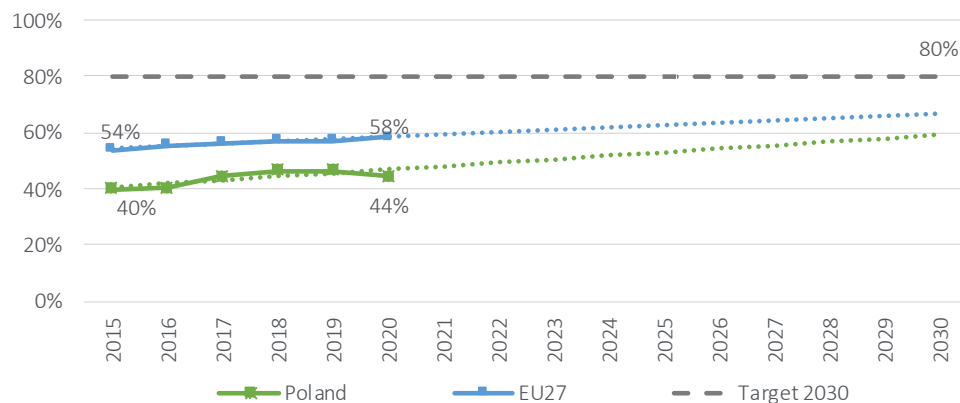
Current trend

The number of ICT specialists has been increasing gradually in Poland in the last five years from 0.42 million in 2015 to 0.55 million in 2020. Poland remains well below the implied Digital Decade target of around 1.7 million and will need to attract and/or train an additional 1.15 million ICT specialists in the country by 2030 if it is to achieve the EU target.

National Recovery and Resilience Plans (NRRPs)

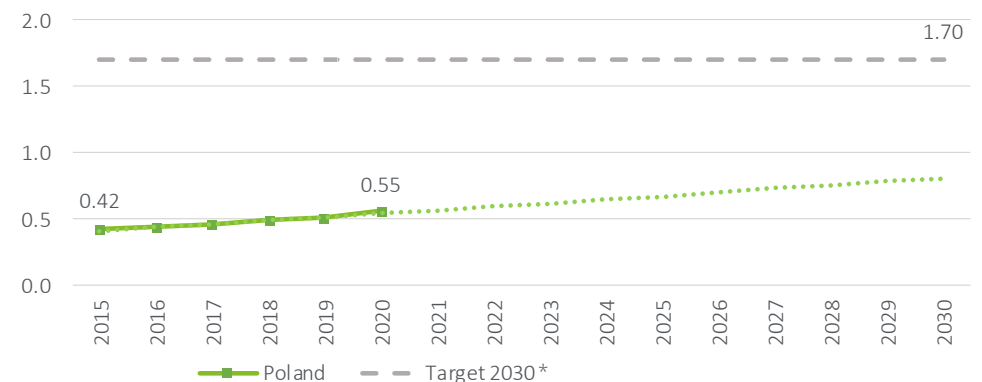
The NRRP does not make explicit commitments to support the training of ICT specialists, however there is potential for some of the investment in digital skills development to contribute to progressing towards the target.

Individuals with at least basic digital skills (% of 16-74 population)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

Number of ICT specialists (millions)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression
* The Member State share of the total EU ICT specialists target (20m) has been apportioned based on population share

Poland

Businesses

Poland appears to have designated up to around €1.6bn of funding to promoting the digitalisation of businesses, but a significant increase in levels of digital intensity and adoption of cloud computing services is required to meet targets.

Digital intensity of SMEs

Current trend

The share of SMEs with at least a basic digital intensity in Poland has declined from 44% in 2015 to 38% in 2019, widening the gap with the EU27 average. Poland will need to reverse the trend and ensure that a further 52% of SMEs digitise to at least a basic level by 2030 if it is to achieve the EU target.

National Recovery and Resilience Plans (NRRPs)

Key elements of the up to around €1.2bn worth of funding linked to promoting digitalisation of businesses include strengthening the digital intensity of SMEs, for example through investments for enterprises to adopt technical and digital solutions (€0.5bn) and ensure closer cooperation between R&D institutes with the enterprise sector (€0.5bn).

Businesses using Cloud computing

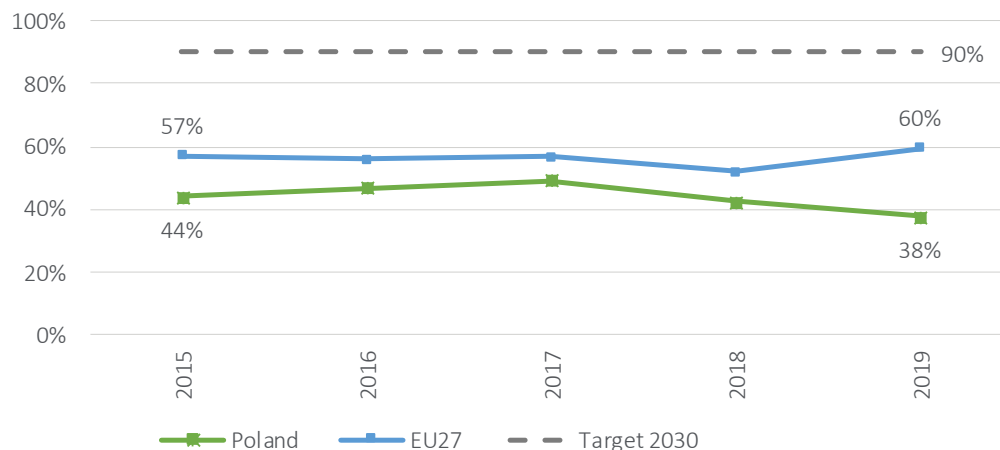
Current trend

Adoption of cloud computing services by businesses in Poland has been lower than the EU27 average over the last five years, with 7% of enterprises using cloud computing services, compared to the EU27 average of 18%. Achieving the EU target by 2030 will require an increase of 68 percentage points in the share of enterprises adopting cloud computing.

National Recovery and Resilience Plans (NRRPs)

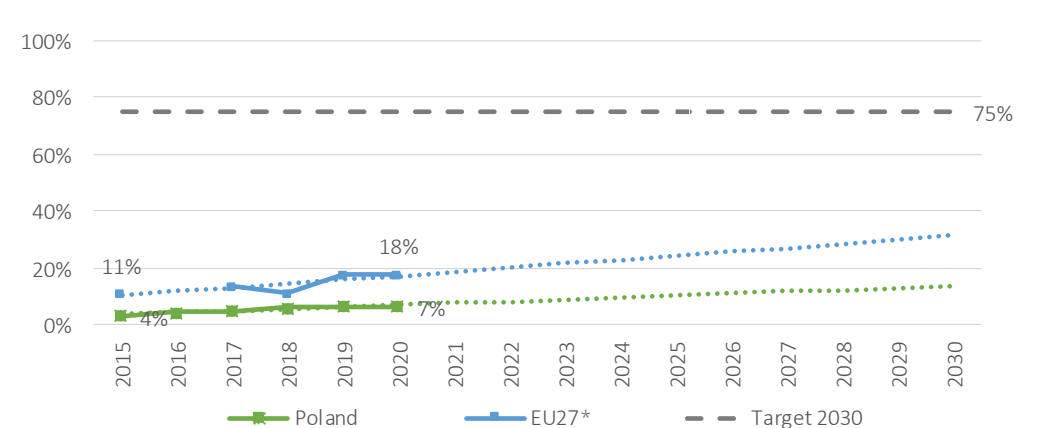
The NRRP includes investment of up to around €0.5bn to ensure the appropriate level of digitalisation and robotisation including cloud and AI, which is complemented by tax credits to support the purchase of cloud solutions.

SMEs with at least a basic level of digital intensity (%)



Source: Eurostat (DII), Deloitte analysis.

Businesses purchasing advanced cloud computing services (%)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression
 * Missing data for 2016 for EU

Poland



Public services

Up to around €0.4bn of Poland's NRRP funds have been linked to the digitalisation of public services, with a further €1bn linked to the development of e-medical records.

Online public services

Current trend

Poland has broadly tracked the EU27 average with 87% online service completion in 2020, compared to 90% in the EU27.

The consistent upward trend of public services provided online suggests that Poland is on track to achieving the EU 2030 target.

National Recovery and Resilience Plans (NRRPs)

Up to around €0.4bn of funding is linked to the digital transformation of public services including the adoption of IT solutions, development of e-services and disruptive technologies in the public sector.

E-medical records and e-IDs

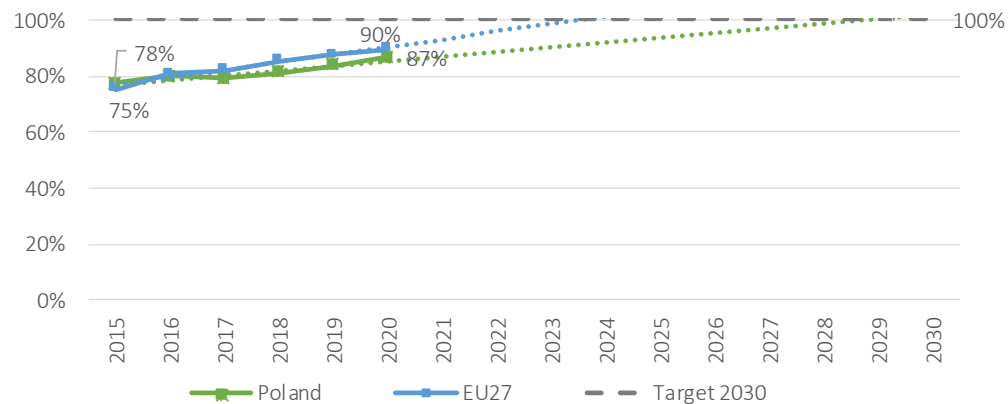
Current trend

According to the NRRP the current level of e-medical records lies at 10%, 90 percentage points below the EU target. Poland lags behind the EU27 average, with 6% of individuals having accessed personal health records online in 2020, compared to an EU27 average of 10%. It also lags the EU27 on related measures, such as seeking health information online (43% vs 56% EU27 average) and making appointments online (11% vs 21% EU27 average).⁵⁵

National Recovery and Resilience Plans (NRRPs)

Poland has committed up to around €1bn to the development of e-medical records as part of the digital transformation of health care and has set a target for medical records to reach 60% within 5 years of plan implementation. The NRRP does not appear to propose specific investments for the development of e-IDs, however this is likely to be covered as part of the digital transformation of public services.

Administrative steps related to major life events that can be done online (%)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression



Portugal

Overview of the plans and progress against targets

Around 20% of Portugal's total NRRP funding has been allocated to digital transformation. Of this amount up to around €4bn appears to be linked to Digital Decade targets across the four areas, and whilst it is progressing well against some Infrastructure and Public Service targets there is improvement required in particular in the Skills and Business areas.



Infrastructure



Skills



Businesses



Public services

Progress against targets



VHCN household coverage

- 83% Portugal (2020)
- 44% EU (2020)
- 100% Target (2030)



Basic digital skills

- 52% Portugal (2020)
- 58% EU (2020)
- 80% Target (2030)



ICT specialists (million)

- 0.19 Portugal (2020)
- 0.46 Target (2030)



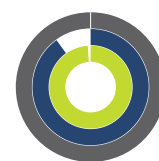
Basic digital intensity

- 59% Portugal (2019)
- 60% EU (2019)
- 90% Target (2030)



Cloud adoption

- 16% Portugal (2020)
- 18% EU (2020)
- 75% Target (2030)



Online services completion

- 99% Portugal (2020)
- 90% EU (2020)
- 100% Target (2030)

Commentary and NRRP commitments

Portugal is well above the EU27 average in terms of VHCN coverage, with 83% of households covered in 2020, compared to the EU27 average of 44%. However, 5G services are still to be launched. Whilst there appears to be no dedicated funding for network infrastructure, there is up to around €78 million of funding partially linked to improving high-speed broadband network capacity in the Madeira region, and a portion of €110 million linked to supporting 5G coverage in business areas i.e. not wide scale national 5G coverage.

The share of adults with basic digital skills in Portugal has been below the EU27 average over the last five years, and was 6 percentage points below the EU27 average in 2020. Whilst the number of ICT specialists has grown in recent years, the number would need to be more than doubled by 2030 to reach the EU target.

The NRRP sets out funding of up to around €1.8bn to support the development of basic digital skills, without explicit commitment linked to ICT specialists.

Digital intensity across businesses and cloud computing uptake broadly tracks the EU27 average, however reaching the EU target by 2030 will require a significant increase in levels of adoption over the coming years, and the corresponding support required.

Within Portugal's NRRP there is up to around €0.7bn of funding linked to supporting SME digitalisation, but funding does not appear to be explicitly linked to cloud adoption targets.

General use of online services in Portugal is higher than the EU27 average with 99% of key public services provided online in 2020, meaning that Portugal is one percentage point away from the target.

Up to around €1bn worth of funding within the NRRP has been linked to the digitalisation of public services with further €0.3bn to support the development of e-medical records.

Portugal

Infrastructure

Portugal is progressing well towards the VHCN coverage target, but is yet to launch 5G services; Whilst there appears to be no dedicated funding for network infrastructure, there is up to around €78 million linked to supporting high capacity networks in the Madeira region and up to around €110 million partially linked to support 5G coverage in business areas, both as part of broader objectives.

Gigabit connectivity

Current trend

Portugal's deployment of VHCNs has accelerated rapidly over the last five years reaching 83% population coverage in 2020. Based on this, Portugal appears on track to meet the EU target, however there may still be barriers to extending coverage to the remaining households particularly in remote rural areas where the commercial and operational challenges of deploying networks can be significant.

National Recovery and Resilience Plans (NRRPs)

Whilst there appears to be no dedicated funding for network infrastructure within Portugal's plans, there is up to around €78 million of funding potentially linked to support the development of high-speed broadband network capacity in the Madeira region (although the primary objective appears to be around digitalisation of the public administration, part of which may be enabled through VHCNs).

5G coverage in populated areas

Current trend

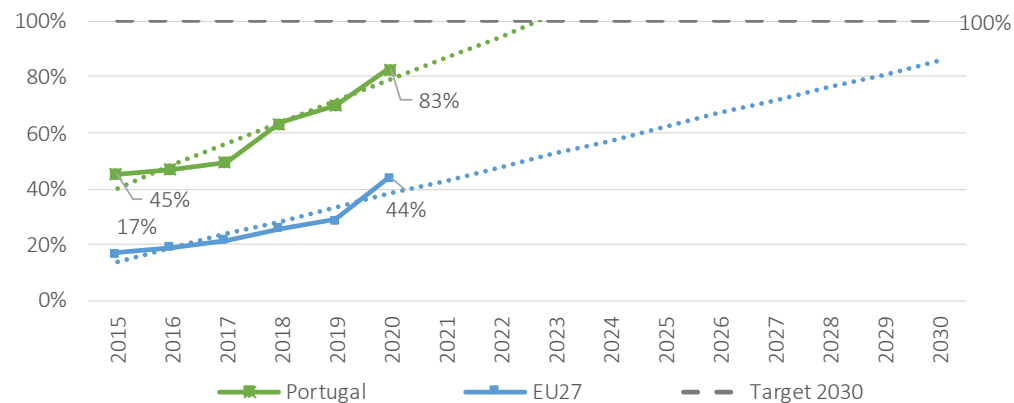
4G population coverage in Portugal had reached 96% by the end of 2020.⁵⁶ Portugal had awarded 8% of harmonised 5G spectrum by the end of 2020, below the EU27 average of 20.5%.⁵⁷ Portugal had not launched 5G services in the EU by the end of March 2021, which may be in part due to the delays to the award of spectrum identified for 5G.⁵⁸

National Recovery and Resilience Plans (NRRPs)

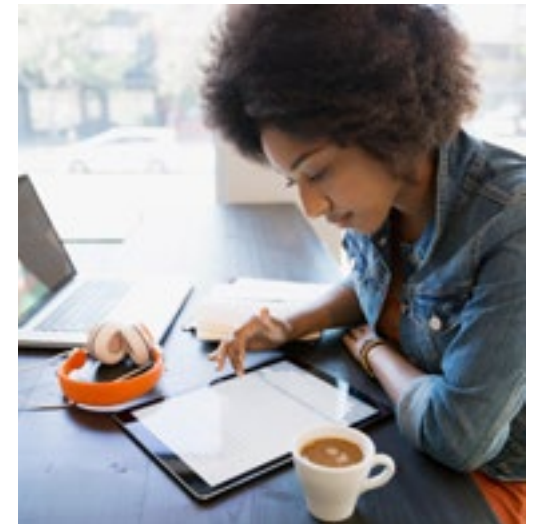
Whilst there appears to be no dedicated funding for 5G coverage, the NRRP sets out up to around €110 million of funding to support business areas part of which is linked to reinforcing 5G communication solutions coverage in areas where businesses are located (e.g. business or industrial hubs) i.e. not aimed at supporting wide scale national 5G coverage.



VHCN (% of households covered)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression



Portugal



Across several packages, a total of up to around €1.8bn has been linked to enhancing the development of digital skills, however achieving targets will require significant increases in the proportion of the population equipped with digital skills and more than a doubling of the number of ICT specialists by 2030.

Adult basic digital skills

Current trend

Around half (52%) of the population in Portugal were reported to have basic digital skills in 2020, which is below the EU27 average of 58%. To achieve the EU target, Portugal will need to equip at least an additional 28% of the population with basic digital skills by 2030.

National Recovery and Resilience Plans (NRRPs)

There is funding of up to around €1.8bn linked to the development of key digital skills, including workshops of high technological intensity (€0.7bn), initiatives to support digital inclusion in population (€0.3bn) and digital transition in education (€0.5bn).

ICT specialists

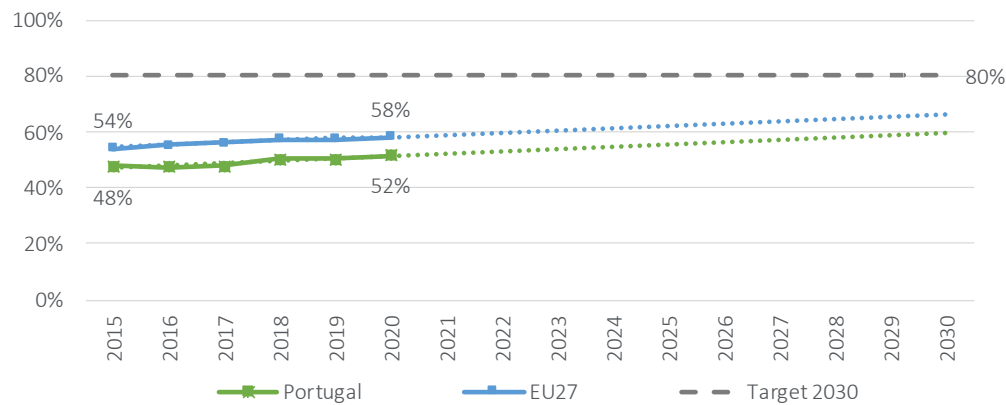
Current trend

The number of ICT specialists has increased in recent years, but remains less than 50% of the 2030 target level. Meeting this target may therefore require additional funding and support to train or attract at least a further 270,000 ICT specialists.

National Recovery and Resilience Plans (NRRPs)

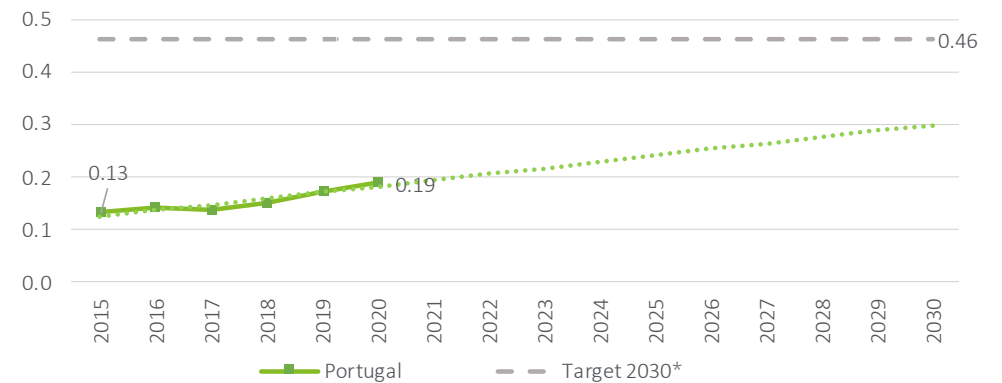
Portugal does not appear to have set specific investments linked to training of ICT specialists, however the funding for enhancing digital skills could still help support progress towards the EU target.

Individuals with at least basic digital skills (% of 16-74 population)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

Number of ICT specialists (millions)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression
* The Member State share of the total EU ICT specialists target (20m) has been apportioned based on population share

Portugal

Businesses

Portugal appears to have designated up to around €0.7bn of funding to promote the digitalisation of businesses, but a significant increase in levels of digital intensity and adoption of cloud computing services is required to meet targets.

Digital intensity of SMEs

Current trend

Portugal tracks the EU27 average in terms of SMEs with at least basic digital intensity, with levels of digital intensity at 59% in 2019, compared to the EU27 average of 60%. A further 31% of total SMEs in the country will need to digitalise by 2030 if Portugal is to reach the EU target.

National Recovery and Resilience Plans (NRRPs)

As part of the up to around €0.7bn funding linked to the digitalisation of enterprises, the NRRP outlines investments to support the digital transition of companies, aiming to support more than 50,000 SMEs (€0.5bn), provide support to 4,000 companies impacted by dissemination of key technologies (€0.1bn) and catalysing the digital transition of enterprises (€0.1bn).

Businesses using Cloud computing

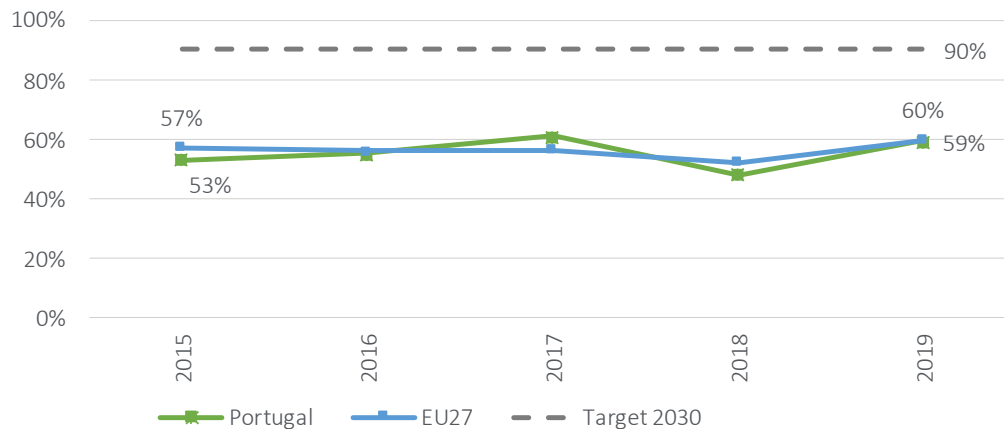
Current trend

Levels of cloud service adoption by businesses in Portugal is broadly in line with the EU27 with 16% of businesses purchasing advanced cloud computing services in 2020, compared to the EU27 average of 18%. This reinforces the challenge faced by the country and potential need for intervention. Achieving the EU target by 2030 will require an increase of 59 percentage points in the share of enterprises adopting cloud computing.

National Recovery and Resilience Plans (NRRPs)

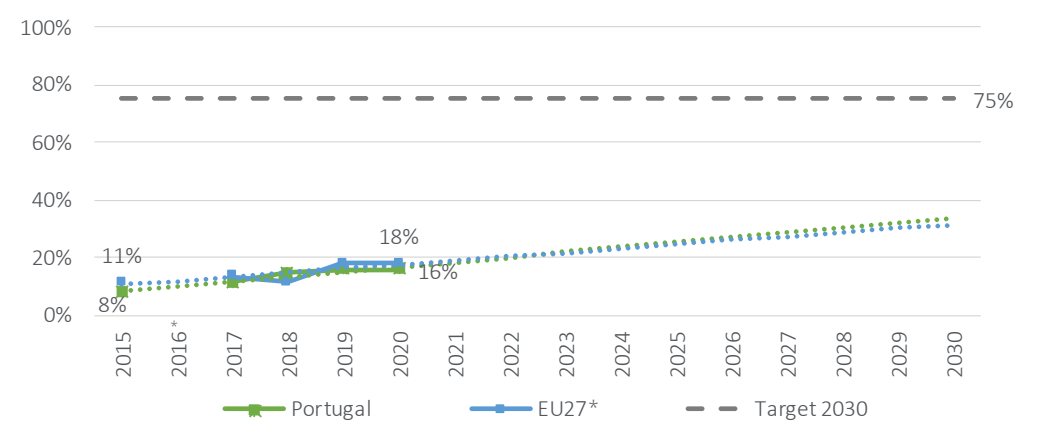
The NRRP does not make explicit commitments to cloud computing services in an attempt to support business digitalisation, however funding allocated to support businesses digitise could be used to facilitate adoption of cloud computing services (directly and/or indirectly).

SMEs with at least a basic level of digital intensity (%)



Source: Eurostat (DII), Deloitte analysis.

Businesses purchasing advanced cloud computing services (%)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression
* Missing data for 2016 for EU

Portugal



Public services

Portugal is reported to be close to achieving the online public services target but will need to significantly increase use of e-medical records to achieve the target. Up to around €1bn of Portugal's NRRP funds have been linked to the digitalisation of public services, with up to a further €0.3bn linked to the development of e-medical records.

Online public services

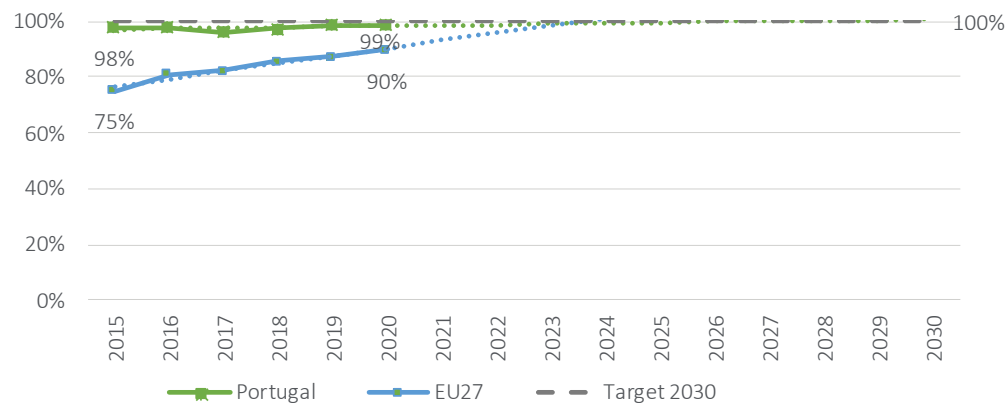
Current trend

Portugal has already achieved 99% of online-enabled administrative steps related to major life events. Nevertheless, there will be broader opportunities to further digitalise public services in the country.

National Recovery and Resilience Plans (NRRPs)

Up to around €1bn of funding is linked to the digital transformation of public services including digital platforms for citizens (€0.3bn), the development of a digital single portal that makes public services available (€0.2bn) and the digital transition of social security (€0.2bn)

Administrative steps related to major life events that can be done online (%)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

E-medical records and e-IDs

Current trend

17% of individuals in Portugal accessed personal health records online in 2020, higher than the EU27 average of 10%. However, Portugal lags behind the EU27 average on some related metrics, such as seeking health information online (49% vs 56% EU27 average) and making appointments online (17% vs 21%).⁵⁹ Achieving the target will require further improvements to facilitate nationwide access to e-medical records.

National Recovery and Resilience Plans (NRRPs)

Portugal has committed significant funding to the digital transformation of health care, however a total of up to around €0.3bn is linked to e-medical records, including digital transition of national registries to standardise data. The NRRP does not make explicit reference to e-IDs, however this might form part of the greater investments targeting the digitalisation of public services.



Romania

Overview of the plans and progress against targets

Around 20% of Romania's total NRRP funding has been allocated to digital transformation. Of this amount up to around €4.3bn appears to be linked to Digital Decade targets across the four areas. Whilst it is progressing well against the VHCN coverage target there is still significant improvement required across all areas.



Infrastructure



Skills



Businesses



Public services

Progress against targets



VHCN household coverage

- 68% Romania (2020)
- 44% EU (2020)
- 100% Target (2030)



Basic digital skills

- 31% Romania (2020)
- 58% EU (2020)
- 80% Target (2030)



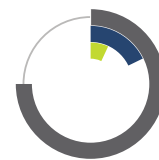
ICT specialists (million)

- 0.20 Romania (2020)
- 0.86 Target (2030)



Basic digital intensity

- 31% Romania (2019)
- 60% EU (2019)
- 90% Target (2030)



Cloud adoption

- 7% Romania (2020)
- 18% EU (2020)
- 75% Target (2030)



Online services completion

- 70% Romania (2020)
- 90% EU (2020)
- 100% Target (2030)

Commentary and NRRP commitments

Romania is well above the EU27 average in terms of VHCN coverage, with 68% coverage in 2020. If coverage continues to be extended at the current rate then Romania would be on track to achieving the 2030 target, however extending coverage to more remote areas may prove more challenging. The NRRP has linked up to around €80 million to support the coverage of high speed fixed internet access services, however does not appear to explicitly link funding to 5G deployment.

Romania has relatively low levels of digital literacy compared to the EU27 average (31% vs 58%), and while it has increased gradually in recent years, digital literacy rates are still around 49 percentage points below the EU target.

Romania would need to increase the number of ICT specialists fourfold by 2030 if it is to achieve the EU target. Romania has proposed a total of up to around €1.1bn funding linked to the EU Skills targets.

Digital intensity across businesses is lower compared to the EU27 average, and was 59 percentage points below the EU target. The share of enterprises using cloud computing is following an upward trend, but remains far below the EU target (7% vs 75%).

Romania has linked up to around €0.9bn worth of funding to supporting SME digitalisation and the adoption of cloud computing services.

General use of online services in Romania is reported to be well below the EU27 average, with 70% online service completion in 2020. At the current level, Romania needs to increase online service completion by 30 percentage points to achieve the EU target.

The NRRP links the up to around €1.9bn to the digitalisation of public services, with a further up to around €0.4bn linked to e-IDs.

Romania

Infrastructure

Romania has a relatively high level of VHCN coverage but significant investment will still be required to reach the EU targets for 5G and VHCNs; The NRRP has linked up to around €80 million to the development of VHCN but does not appear to have funding linked to supporting deployment of 5G.



Gigabit connectivity

Current trend

In Romania around 68% of households had access to VHCN in 2020, well ahead of the EU27 average of 44%. However, the rate of recent growth – combined with challenges in ensuring coverage for less populated areas – means that significant investment is likely to be required to reach the EU target of 100% coverage.

National Recovery and Resilience Plans (NRRPs)

The NRRP has linked up to around €80 million to support the coverage of high speed fixed point internet access services of approximately 790 rural villages. Additionally, there is up to around €69 million of funding to support network infrastructure build within Romania's national broadband plans.⁶⁰

5G coverage in populated areas

Current trend

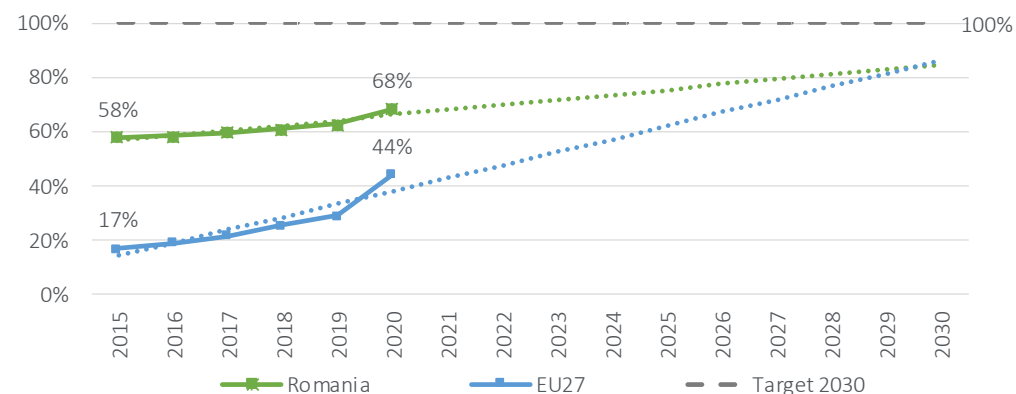
Romania had assigned 21% of harmonized 5G spectrum by the end of 2020. This is in line with the EU27 average but may act as a barrier to deployment in the short term, with c.80% of 5G spectrum not yet available to operators.⁶¹

4G population coverage in Romania had reached 85% by the end of 2020.⁶² In terms of 5G coverage, the first commercial deployments are understood to have taken place in 2019. Deployment is progressing mainly across urban areas. For example, in late August 2020, Orange Romania announced its 5G network had been expanded to cover the entire city of Bucharest.^{a 63}

National Recovery and Resilience Plans (NRRPs)

The NRRP mentions the development of 5G as part of the cloud strategy and administration strategy, however within the plans there is no funding explicitly linked to supporting 5G deployment.

VHCN (% of households covered)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

a) Some, if not all, of the 5G deployments that have been announced are understood to be based on non-standalone (NSA) architecture, which may not deliver the full extent of network performance and features (e.g. ultra low latency), required to enable the full extent of 5G use cases. 5G Standalone (SA) deployments are expected to deliver this but are likely to require significant additional investment.

Romania

Skills

Up to around €1.1bn has been linked to helping achieve the digital skills targets, however achieving both targets is going to require a significant increase in the number of ICT specialists and people with basic digital skills.

Adult basic digital skills

Current trend

In 2020, less than one third of adults were reported to have at least basic digital skills, which is the second-lowest level across the EU. Based on the recent trends, further measures including funding may needed to boost and improve digital skills across the country.

National Recovery and Resilience Plans (NRRPs)

Within Romania's plans, up to around €1.1bn of funding has been linked to the digitalisation of education, to enhance the digital skills of students and teachers and adapt the curriculum for learning in virtual environment.

ICT specialists

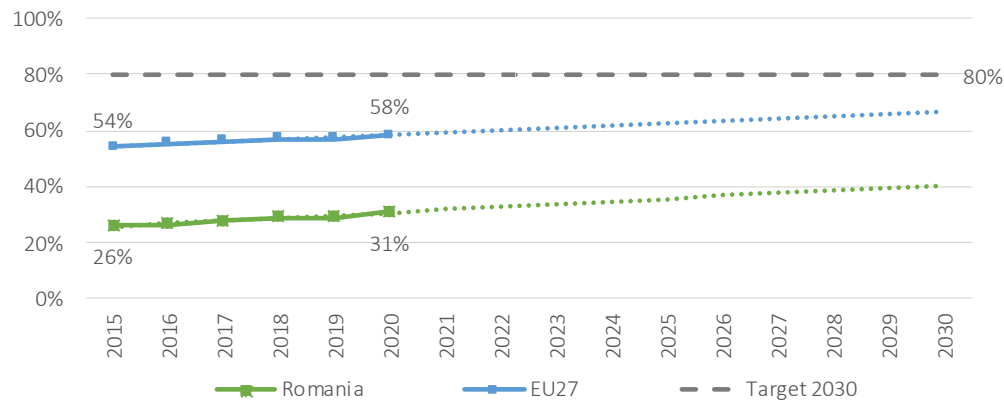
Current trend

The number of ICT specialists in Romania has been steadily increasing over the last five years, however there will need to be more than a fourfold increase in the number of ICT specialists by 2030 if Romania is to meet the EU target.

National Recovery and Resilience Plans (NRRPs)

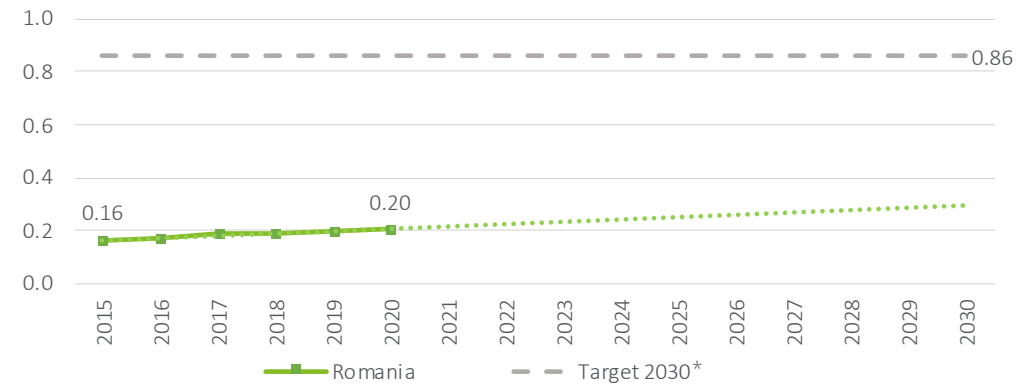
The NRRP does not appear to propose specific funding linked to the training of ICT specialists, however this might be covered indirectly through spending on digital education.

Individuals with at least basic digital skills (% of 16-74 population)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

Number of ICT specialists (millions)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

* The Member State share of the total EU ICT specialists target (20m) has been apportioned based on population share

Romania

Businesses

Romania appears to have designated up to around €0.9bn of funding to promoting the digitalisation of businesses and cloud, but a significant increase in levels of digital intensity and adoption of cloud computing services is required to meet targets.

Digital intensity of SMEs

Current trend

Levels of basic digital intensity among SMEs is relatively low compared to the EU27 average. Achieving the EU target by 2030 is likely to require a significant increase in the level of SME digitalisation, and the measures to support it.

National Recovery and Resilience Plans (NRRPs)

Up to around €0.8bn funding linked to the digitalisation of businesses includes supporting the digitalisation of SMEs in the private sector (€0.76bn) and SMEs in the tourism and culture sector (€4 million).

Businesses using Cloud computing

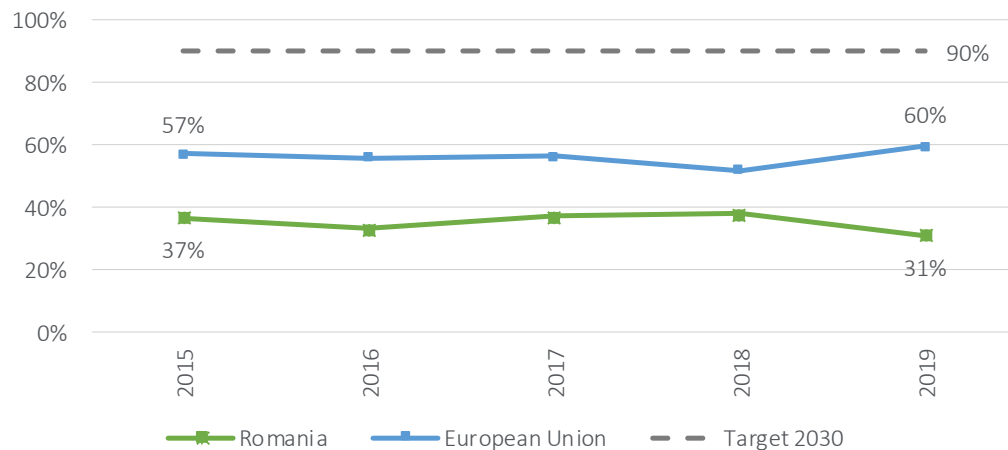
Current trend

Adoption of cloud services among businesses in Romania is relatively low (7%) compared to the EU27 average of 18%. This highlights the significant scope for increased cloud adoption but achieving the EU target will require a significant acceleration in the rate of adoption over the coming years.

National Recovery and Resilience Plans (NRRPs)

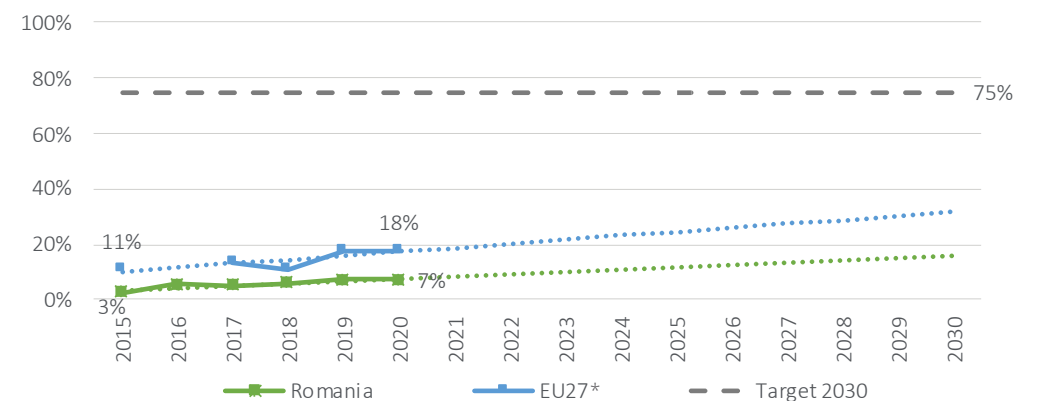
The NRRP proposes up to around €0.1bn worth of funding linked to the development of highly advanced technologies such as high performance computing and cloud.

SMEs with at least a basic level of digital intensity (%)



Source: Eurostat (DII), Deloitte analysis.

Businesses purchasing advanced cloud computing services (%)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

* Missing data for 2016 for EU

Romania



Public services

Up to around €1.9bn of the NRRP funds in Romania have been linked to the digitalisation of public services, with a further up to around €0.4bn linked to the development of e-IDs.

Online public services

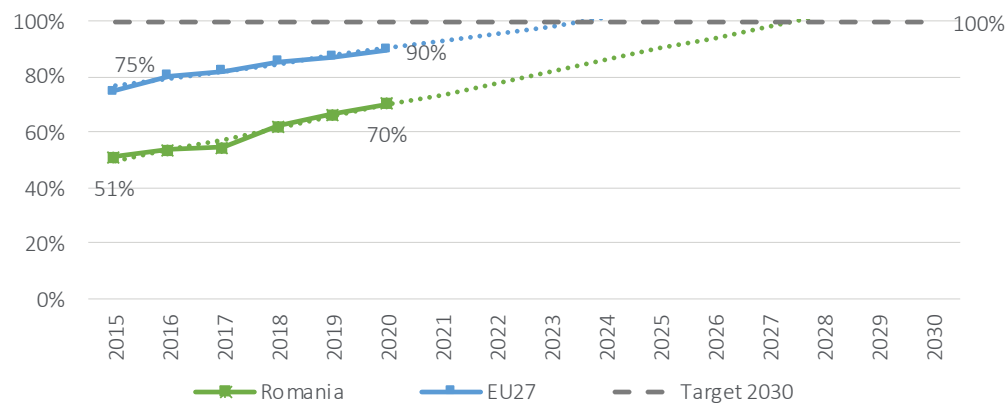
Current trend

In 2020 it was reported that 70% of administrative steps related to major life events could be completed online, less than the EU27 average of 90%. Although the 2030 target appears achievable based on the current trajectory, further support measures may yet be needed to support the complete transition of these public services to online access.

National Recovery and Resilience Plans (NRRPs)

Within the NRRP, up to around €1.9bn of funding has been linked to the digital transformation of public services including the adoption of government cloud and interconnection of digital public systems (€1.9bn) and a reform to strengthen the efficiency of justice (€0.01bn).

Administrative steps related to major life events that can be done online (%)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

E-medical records and e-IDs

Current trend

Romania lags behind the EU27 average, with 5% of individuals having accessed personal health records online in 2020, compared to an EU27 average of 10%, suggesting that further measures may still be needed to enable access to e-medical records for the entire population. Romania also lags behind the EU on related measures, such as seeking health information online (28% vs 56% EU27 average) and making appointments online (5% vs 21% EU27 average).⁶⁴

National Recovery and Resilience Plans (NRRPs)

The NRRP outlines spending commitments to support healthcare digitalisation, however does not make explicit funding commitments for the development of e-medical records. The NRRP further proposes up to around €0.4bn worth of funding as part of fiscal and pension reforms which is linked to the e-IDs target.



Spain

Overview of the plans and progress against targets

Around 30% of Spain's total NRRP funding has been allocated to digital transformation. Of this amount up to around €25.4bn appears to be linked to Digital Decade targets across the four areas. Whilst it is progressing very well against some Infrastructure and Public Service targets there is improvement required in particular in the Skills and Businesses areas.^a

a) The analysis is based on a review of the plans that were first published on 27 April 2021 and do not take account of subsequent changes or additional submissions to those plans after the date of the first publication (see page 91 for links to the plan documents that were reviewed as part of this study).

b) Part of the investment is also considered under skills targets therefore c.€3.6bn is excluded from the total funding to avoid double counting.



Infrastructure



Skills



Businesses



Public services

Progress against targets



VHCN household coverage

- 89% Spain (2020)
- 44% EU (2020)
- 100% Target (2030)



Basic digital skills

- 57% Spain (2020)
- 58% EU (2020)
- 80% Target (2030)



ICT specialists (million)

- 0.73 Spain (2020)
- 2.12 Target (2030)



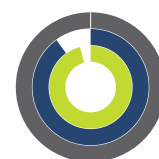
Basic digital intensity

- 64% Spain (2019)
- 60% EU (2019)
- 90% Target (2030)



Cloud adoption

- 16% Spain (2020)
- 18% EU (2020)
- 75% Target (2030)



Online services completion

- 96% Spain (2020)
- 90% EU (2020)
- 100% Target (2030)

Commentary and NRRP commitments

Spain's VHCN coverage is significantly above the EU27 average. Spain appears on track to achieving the 2030 target, although deploying networks to the final 10 percent of households can pose significant challenges.

Up to around €4.0bn has been linked to improving digital connectivity, promoting cybersecurity and 5G rollout. The NRRP includes an ambition to extend ultra-fast broadband and mobile coverage of 30Mbps to 100% of the population and deploy 5G in populated areas.

In terms of digital skills Spain is broadly in line with the EU27 average. The number of ICT specialists has been increasing gradually but is still less than half the target level.

Up to around €7.3bn worth of funding is linked to support digital skills development, with a strong focus on basic digital skills. The NRRP unveils a number of packages to support this objective, which also target the development of ICT specialists.

Spain is just above the EU27 average in terms and SMEs basic digital intensity and just below the EU27 average in terms of cloud adoption. Achieving the targets is likely to require a significant acceleration in cloud adoption and increase in SME digital usage.

Within the plans there is up to around €12.3bn linked to supporting the digital transformation of SMEs and the adoption of cloud computing. The NRRP sets out the initiative to boost the digital transformation of SMEs and support training in digital skills.^b

Spain has historically been above the EU27 average in terms of general use of online services. Up to around €4.3bn of funding has been linked to the modernisation of public services.

Within the plan there is also a component covering the "renewal and expansion of health system", which has a total value of up to around €1.1bn, and includes e-medical records as part of a broader range of initiatives. The plan also sets an aim to adapt the national legal system to community regulations in particular on electronic identification but without any explicit spending commitments.

Spain

Infrastructure

Spain is progressing well towards the VHCN coverage target and there is up to around €4bn linked to supporting further rollout of VHCNs (fibre and 5G).

Gigabit connectivity

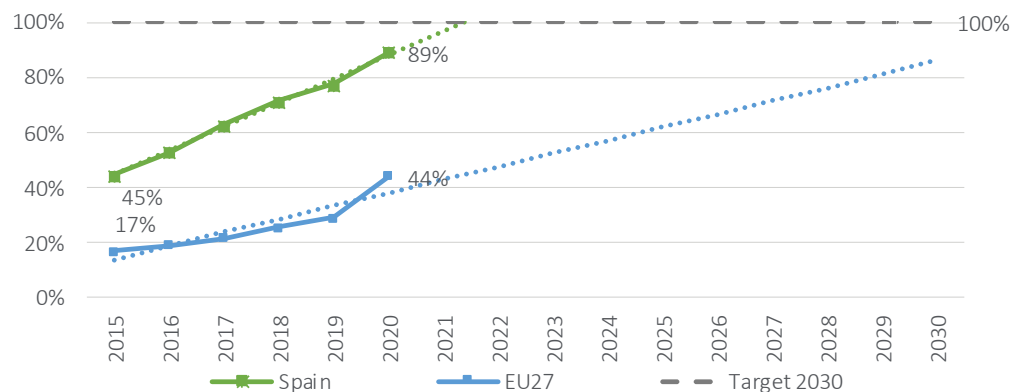
Current trend

Spain has historically been above the EU27 average in terms of VHCN coverage with 89% of households covered in 2020. Whilst it appears on track to achieve the target before 2030, deploying networks to the final 10 percent of households can pose significant additional commercial and operational challenges (e.g. due to relative high deployment cost and/or physical obstacles such as terrain), which may slow down the current rate of network deployment.

National Recovery and Resilience Plans (NRRPs)

Spain has set an ambition to extend ultra-fast broadband for 100% of the population as part of a up to around €4bn package aimed at digital connectivity, promoting cybersecurity and 5G rollout.

VHCN (% of households covered)



5G coverage in populated areas

Current trend

4G population coverage in Spain had reached 95% by the end of 2020.⁶⁵ Spain has taken gradual steps towards enabling 5G by awarding 30% of harmonized 5G spectrum by the end of 2020.⁶⁶ The Spain Digital Agenda 2025 outlines the target to prepare 100% of the radio spectrum for 5G by 2025.⁶⁷ In terms of 5G coverage, MNOs in Spain have announced that they have undertaken initial commercial 5G deployments mainly in densely populated urban areas (e.g. cities).⁶⁸ However, many of these deployments (if not all) are understood to be based on non-standalone (NSA) architecture, which may not deliver the full network performance and features (e.g. ultra low latency), that have the potential to enable or support many of the 5G use cases. 5G Standalone (SA) deployments are expected to deliver this but are likely to require significant additional investment.⁶⁹

National Recovery and Resilience Plans (NRRPs)

Within Spain's plans there is a up to around €4bn package aimed at digital connectivity, promoting cybersecurity and 5G rollout, with support for 5G deployment focussed on populated centres, transport corridors and rural areas.



Spain



Across a number of packages related to digital skills, a total of up to around €7.3bn has been linked to helping achieve the skills targets, however achieving the targets is going to require a significant increase in the number of ICT specialists and people with basic digital skills.

Adult basic digital skills

Current trend

Spain has broadly tracked the EU27 average with 57% of the population currently having at least a basic level of digital skills. Achieving the target will mean equipping an additional 23% of the population with these basic digital skills.

National Recovery and Resilience Plans (NRRPs)

The NRRP outlines the proposed actions to enhance digital skills with a total of up to around €7.3bn linked to achieving the basic digital skills target (albeit, as with all plans analysed in this study, some of this funding may be allocated towards other objectives i.e. not just digital skills). Key elements of the funding include a national plan for digital competences (€3.6bn), promotion of vocational trainings (€2.1bn) and modernisation and digitalisation of the education system including early education from 0-3 years (€1.6bn).

ICT specialists

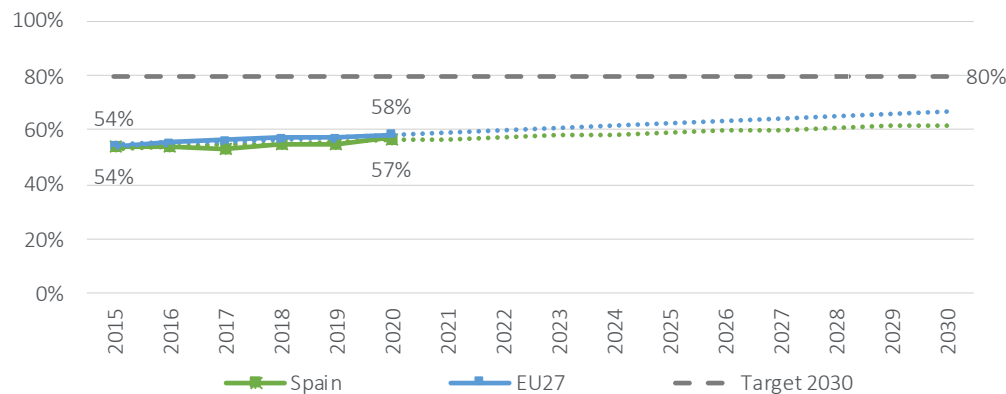
Current trend

The number of ICT specialists in Spain has grown gradually over the last five years increasing by around 180,000 (c.33%) over said period. However, achieving the target will require around 1.4 million additional ICT specialists to be trained, nearly twice the current number of ICT specialists in the country.

National Recovery and Resilience Plans (NRRPs)

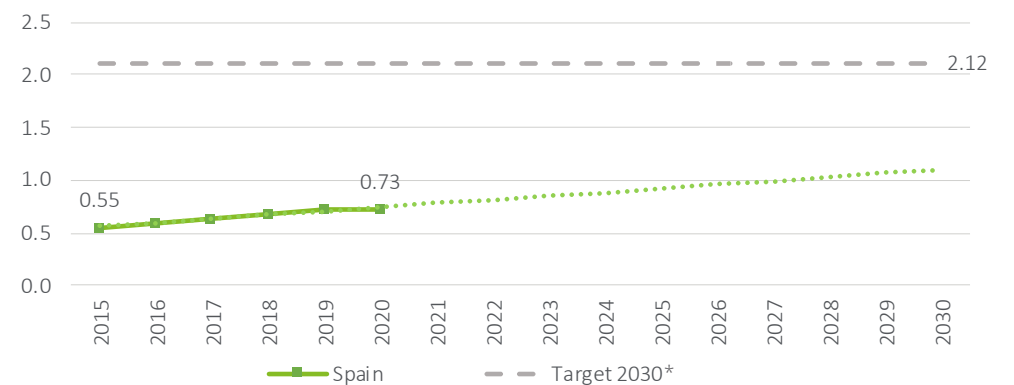
As part of the up to around €3.6bn funding for digital competences, Spain has outlined its commitment to increasing the number of ICT specialists, although funding does not appear to have been explicitly allocated to this.

Individuals with at least basic digital skills (% of 16-74 population)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

Number of ICT specialists (millions)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

* The Member State share of the total EU ICT specialists target (20m) has been apportioned based on population share

Spain

Businesses

Spain appears to have designated around €12.3bn of funding to promote the digitalisation of businesses and the adoption of cloud computing, but a significant increase in levels of digital intensity and adoption of cloud computing services is required to meet targets.

Digital intensity of SMEs

Current trend

The share of SMEs in Spain with at least a basic digital intensity has dropped significantly in 2018 but managed to recover by 2019 and is now broadly in line with the EU27 average. Achieving the target will require a significant increase in the proportion of SMEs using digital tools given Spain is currently around 26 percent points below the target.

National Recovery and Resilience Plans (NRRPs)

Up to around €3.6bn worth of funding contained within the NRRP is linked to the digital transformation of, and digital training for, SMEs.^a

a) The investment is also considered under skills targets therefore excluded from the total funding to avoid double counting

Businesses using Cloud computing

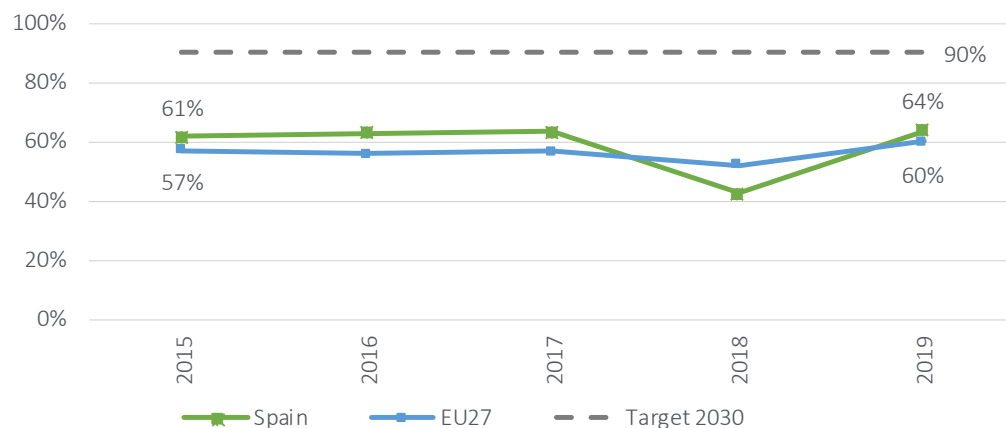
Current trend

Adoption of cloud computing services by businesses in Spain has been broadly in line with the EU27 average, and in 2020 was just below the EU27 average (16% vs 18%). Based on the recent trend, Spain will need to significantly increase the rate of cloud service adoption to achieve the target set by 2030.

National Recovery and Resilience Plans (NRRPs)

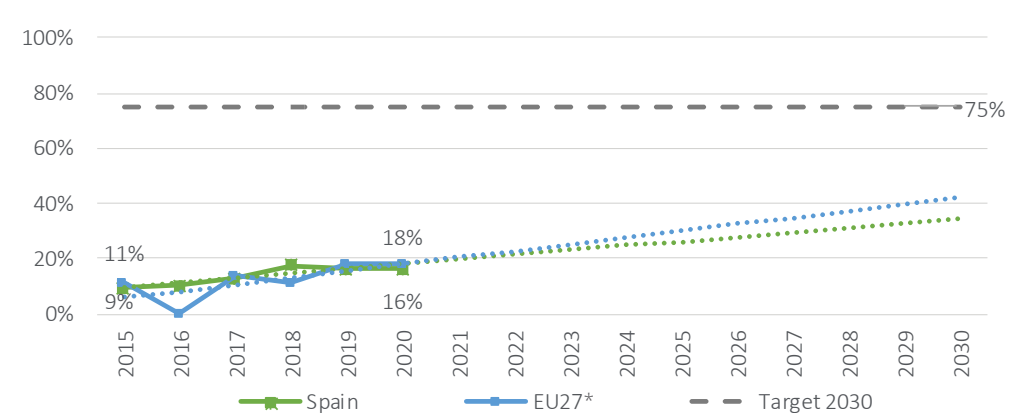
The NRRP includes investments of up to around €8.7bn linked to the target, including the development of cloud platforms (€3.8bn) as part of Spain's industrial policy and support to SMEs for adopting digital solutions (€4.9).

SMEs with at least a basic level of digital intensity (%)



Source: Eurostat (DII), Deloitte analysis.

Businesses purchasing advanced cloud computing services (%)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression

* Missing data for 2016 for EU

Spain



Public services

Up to around €5.4bn worth of funding in Spain's plans is linked to digitalisation of public services, and Spain appears on track to meet the 2030 target for online public services provided it can maintain the growth in online usage.

Online public services

Current trend

Spain has historically been above the EU27 average, with online public services completion at 96% in 2020. The current trend leaves Spain only 4 percentage points away from the target, and if historic growth continues then Spain will potentially be on track to meet the target potentially before 2030.

National Recovery and Resilience Plans (NRRPs)

As part of the up to around €4.3bn worth of funding committed to modernisation of public administration, the NRRP outlines a series of reforms and investments in the digitalisation of various state departments and the development of data driven public services.

E-medical records and e-IDs

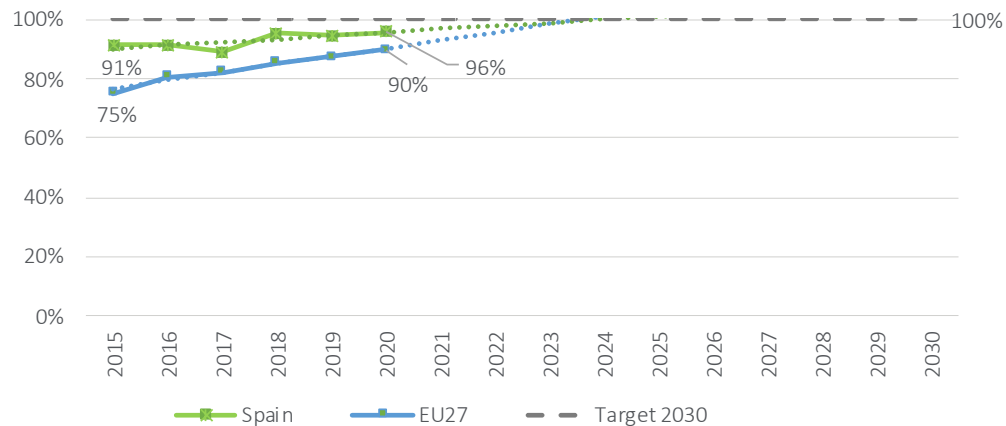
Current trend

18% of individuals in Spain accessed personal health records online in 2020, compared to an EU27 average of 10%. Yet, achieving the target of e-medical records for 100% of citizens will require further investments. Spain is above the EU27 average on other related metrics, such as seeking health information online (67% vs 56% EU27 average) and making appointments online (40% vs 21%).⁷⁰

National Recovery and Resilience Plans (NRRPs)

Within the plan there is a component covering "renewal and expansion of health system", which has a total value of up to around €1.1bn, and includes e-medical records and the generation of a health data centre that collects information, as part of a broader range of initiatives. The NRRP does not appear to propose specific investments for the development of e-IDs, however this is likely to be covered as part of the digital transformation of public services.

Administrative steps related to major life events that can be done online (%)



Source: DESI, Deloitte analysis. Dotted lines represent indicative projections based on linear regression



Conclusion and
next steps



Wrap Up

Member states are committing significant investment to the digital transformation of their economies; however, this could be insufficient in certain areas including Digital infrastructure, ICT specialists and SME digitalisation

Funding linked to Digital Decade targets

- The Digital Decade targets are ambitious and will require high levels of improvement in each of the targeted areas over the coming years. If the current trajectory of progress towards the Digital Decade targets continues, by 2030 the EU may not achieve many of the targets that have been set.
- The 20 Member states have committed significant investment of up to €154bn towards digital transformation across the NRRPs. Of this amount, up to €131bn appears to be directly linked to achieving the Digital Decade targets.
- The gap between current levels and target levels of digitalisation varies greatly across Member States. Each country will face different challenges depending on several factors including the structure of the economy, the population density and demography and the geography of the territory. The majority of NRRPs include Digital funds that amount to 25% or less of the total and it is uncertain whether this will be sufficient for those countries facing the greatest challenges.

Areas where further investment may be needed

- Based on high-level analysis of the NRRPs, taking into account current trends and challenges, the potential for a gap between the targets and the levels achieved with proposed investments appears greatest in digital infrastructure, ICT specialists and digitalisation of SMEs (albeit there is wide variation between Member States and each will face different challenges in seeking to reach the Digital Decade targets).
- Digital infrastructure and connectivity has been recognised as important across the 20 Member States' plans. However, the collective investment across NRRPs and NBPs amounts to 46% of the investment gap estimated for digital connectivity (this share refers to investment of 20 Member states analysed in this report, and does not account for any investment by the remaining seven Member States).
- Further, while the NRRPs across the 20 Member States all provide funding to support SMEs digitalisation, the aggregate investment amounts to 10% of current SME digitalisation spend. Spain and Italy alone account for around two thirds of the €40bn amount.
- The 20 Member States have committed to investment in education, of which up to around €47bn is linked to digital skills. However, 9 out of 20 Member States appear to have linked funding to specifically increasing the number of ICT specialists (one of the key targets), which accounts for around a tenth of the total investment in digital skills.

Next steps

The Commission is currently assessing the plans that have been submitted for review, which is expected to be followed by an evaluation by the European Council. In order to drive forward the Digital Decade ambitions, both may consider this analysis and the extent to which the National Recovery and Resilience Plans contribute to achieving these targets.

NRRPs reviewed and sources

The analysis is based on the main plan (NRRP) submitted by member states.^a

Member State	Link to plan reviewed	Publication date	Deep-dive country
Austria	Österreichischer Aufbau- und Resilienzplan 2020-2026.pdf	4/30/2021	
Belgium	FR - Plan national pour la reprise et la résilience.pdf (belgium.be)	4/30/2021	
Croatia	55 - 1 NPOO.pdf (gov.hr)	4/29/2021	
Cyprus	Cyprus Recovery and Resilience Plan 2021-2026.pdf (dgepcd.gov.cy)	Not stated	
Czechia	Národní plán obnovy O plánu (planobnovy.cz)	6/1/2021	✓
Denmark	Denmark's Recovery and Resilience Plan - accelerating the green transition (fm.dk)	Apr-21	
France	PNRR Francais.pdf (economie.gouv.fr)	Not stated	✓
Germany	Bundesfinanzministerium - Deutscher Aufbau- und Resilienzplan (DARP)	Not stated	✓
Greece	adf63b36-9a48-4ea1-b0c9-a55f266160ad (minfin.gr)	May-21	✓
Hungary	HET_Hungary_0517 (1).pdf	Not stated	✓
Italy	PNRR.pdf (governo.it)	Not stated	✓
Latvia	Dokumenti (esfondi.lv)	4/30/2021	
Lithuania	Ekonomikos gaivinimo ir atsparumo didinimo priemonė „Naujos kartos Lietuva“ (lrvt.lt)	May-21	
Luxembourg	Plan pour la reprise et la résilience 2021 (gouvernement.lu)	Apr-21	
Poland	KPO_projekt_30042021.pdf	Apr-21	✓
Portugal	ficheiro.aspx (portugal.gov.pt)	4/22/2021	✓
Romania	0c2887df42dd06420c54c1b4304c5edf.pdf (gov.ro)	Not stated	✓
Slovakia	prezentacia_plan-obnovy.pdf (planobnovy.sk)	Not stated	
Slovenia	nacrt-za-okrevanje-in-odpornost_dokument_30-4-2021.pdf (eu-skladi.si)	Apr-21	
Spain	30042021-Plan_Recuperacion_Transformacion_Resiliencia.pdf (lamoncloa.gob.es)	4/27/2021	✓

a) The analysis focuses on the original plans submitted to the European Commission and does not consider supporting documents and/or subsequent updates.

Glossary and References



Glossary

Acronyms	Descriptions
BAG+5	Equivalent to a Master's degree in the UK. The number +5 refers to the years of study after the baccalaureat
Bn	Billion
CEF2 Digital	Connecting Europe Facility
DD	Digital Decade
DESI	Digital Economy and Society Index
DII	Digital Intensity Index
EC	European Commission
EIB	European Investment Bank
E-ID	Electronic identity
E-medical record	Electronic medical record
ERDF	European Regional Development Fund
ETIs	Intermediate sized enterprises
EU	European Union
EU27	The 27 European Union countries
5G	Fifth generation of mobile technology
4G	Fourth generation of mobile technology
HPC	High Performance Computing
ICT	Information and communications technology

Acronyms	Descriptions
IPCEI	Important Project of Common European Interest
IT	Information technology
ITS	Information technology services
Mbps	Megabits per second
MNOs	Mobile Network Operators
NBP	National Broadband Plans
NGA	Next generation access
NRRP	National Recovery and Resilience Plans
OpenRAN	Open radio access network
PhD	Doctor of philosophy
PP	Percentage point
R&D	Research and Development
RRF	Recovery and Resilience Facility
6G	Sixth generation of mobile technology
SMEs	Small to medium sized enterprises
STEM	Science, Technology, Engineering and Mathematics
VHCN	Very High Capacity Network
VSEs	Very small enterprises

References

1. [DESI by components](#)
2. [2030 Digital Compass](#)
3. [DESI by components](#)
4. [DESI by components](#)
5. [DESI by components](#)
6. [Digital Intensity Index](#)
7. [DESI by components](#)
8. [RRF](#)
9. [The Recovery and Resilience Facility](#)
10. [The Recovery and Resilience Facility](#)
11. [The Recovery and Resilience Facility](#)
12. [EC's Guidance to Member States Recovery and Resilience Plans](#)
13. [Digital Compass and Digital Decade targets](#)
14. [Eurostat](#)
15. [DESI](#)
16. Digital Decade targets, DESI by components; [Digital Intensity Index](#), and [2030 Digital Compass](#)
17. [NGA](#)
18. [VHFC](#)
19. [Broadband in EU countries](#)
20. [2030 Digital Compass: the European way for the Digital Decade](#)
21. [Broadband in EU countries](#)
22. [Basic digital skills](#)
23. [ICT specialists](#)
24. [Digital Intensity Index](#)
25. [Cloud computing Services](#) refers to hosting of the enterprise's database, accounting software applications, CRM software, computing power
26. [Online Service Completion](#) The share of administrative steps related to major life events (birth of a child, new residence, etc) that can be done online. The following life events are included in the scope: Regular business operations and Business Start-up, Moving, Owning and driving a car, Starting a small claims procedure, Family, Career and Studying;
27. [DESI](#)
28. [DESI by components](#)
29. [5G Observatory](#) and [Vodafone](#)
30. [Eurostat](#)
31. [DESI](#)
32. [DESI](#)
33. [5G Observatory](#) - Commercial Launches
34. [Eurostat](#)
35. [DESI](#)
36. [DESI](#)
37. [5G Observatory](#)
38. [Eurostat](#)
39. [DESI](#)
40. [5G Observatory](#)
41. [Eurostat](#)
42. [Broadband in EU countries](#)
43. [DESI](#)
44. [DESI](#)
45. [5G Observatory](#) - Commercial Launches
46. [Eurostat](#)
47. [DESI](#)
48. [DESI](#)
49. [5G Observatory](#)
50. [Eurostat](#)
51. [Eurostat](#)
52. [DESI](#)
53. [5G Observatory](#)
54. [National 5G Plans and Strategies](#)
55. [Eurostat](#)
56. [DESI](#)
57. [DESI](#)
58. [5G Services](#)
59. [Eurostat](#)
60. [Broadband in EU countries](#)
61. [DESI](#)
62. [DESI](#)
63. [5G Observatory](#)
64. [Eurostat](#)
65. [DESI](#)
66. [DESI](#)
67. [Country information – Spain](#)
68. [5G Observatory](#)
69. [Ericsson](#)
70. [Eurostat](#)



This document is not to be copied or made available to any other party. Deloitte LLP does not accept any liability for use of or reliance on the contents of this document by any person save by the intended recipient(s) to the extent agreed in a Deloitte LLP engagement contract.

If this document contains details of an arrangement that could result in a tax or National Insurance saving, no such conditions of confidentiality apply to the details of that arrangement (for example, for the purpose of discussion with tax authorities).

Deloitte LLP is a limited liability partnership registered in England and Wales with registered number OC303675 and its registered office at 1 New Street Square, London, EC4A 3HQ, United Kingdom.

Deloitte LLP is the United Kingdom affiliate of Deloitte NSE LLP, a member firm of Deloitte Touche Tohmatsu Limited, a UK private company limited by guarantee ("DTTL"). DTTL and each of its member firms are legally separate and independent entities. DTTL and Deloitte NSE LLP do not provide services to clients. Please see www.deloitte.com/about to learn more about our global network of member firms.