**Council of the European Union**

## COVER NOTE

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| From: | Secretary-General of the European Commission, signed by Ms Martine DEPREZ, Director |
| date of receipt: | 2 July 2024 |
| To: | Ms Thérèse BLANCHET, Secretary-General of the Council of the European Union |
| No. Cion doc.: | SWD(2024) 260 final |
| Subject: | PART 2/2 COMMISSION STAFF WORKING DOCUMENT Digital Decade in 2024: Implementation and perspective |

Delegations will find attached document SWD(2024) 260 final.

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Encl.: SWD(2024) 260 final

EUROPEAN
COMMISSION

Brussels, 2.7.2024
SWD(2024) 260 final

PART 2/2

**COMMISSION STAFF WORKING DOCUMENT**

**Digital Decade in 2024: Implementation and perspective**

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**Annex 1      List of relevant policy initiatives**

The table below provides an overview of actions taken since 2020 to implement the EU's digital strategy. It summarises key achievements contributing to the three overarching areas covered by the Digital Decade targets and objectives: (i) fostering a sovereign and competitive Europe, (ii) empowering people and society, and (iii) contributing to the green transition. The fourth column further specifies the contribution of a given action to the Digital Decade, distinguishing between contributions to general objectives, targets, as well as Multi-Country Projects (MCPs).

Please note that the categorization of initiatives across the three areas mentioned above (fostering a sovereign and competitive Europe, empowering people and society, and contributing to the green transition) is indicative, as several initiatives are directly linked to more than one area (e.g. the initiatives in the area of online platforms contribute to both fostering a sovereign and competitive Europe and to empowering people and society by building a human centric digital transformation; a similar consideration applies to the action in the area of key digital public services, eID and others).

| Action item | Short description & next steps | DDPP relevance<br>General objective /Cardinal points -target - MCPs |
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| **Fostering a sovereign and competitive Europe** | | |
| **Cutting-edge digital capacities** | | |
| Building and deploying **cutting-edge joint digital capacities** in the following areas: | The following rows refer to the categories listed in the 2020 Communication.<br>In addition to the areas where cutting--edge digital capacities are being built and deployed. The work on **semiconductors** is ongoing:<br>• In **February 2022**, the **European Chips Act** proposal was adopted; a political agreement was reached on 18 April 2023 and the act entered into force on 21 September 2023. | • Objective: Sovereignty, resilience<br>• Infrastructure, Target on Semi-processors |
| • AI | • In **January 2023**, **Testing and Experimentation Facilities** (***TEF***) in AI and robotics were launched for the healthcare, agri-food, smart cities, and communities and manufacturing sectors (total cost of EUR 220 million). A TEF for AI in | • Target on Digitalisation of business and public services<br>• MCPs |

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| | the energy sector will start in 2024. | |
| | • Networks of **excellence centres** and **European Digital Innovation Hubs** (DIHs) in AI and robotics are being created. | |
| | • An **AI-on-demand platform** is supported by several projects (under Horizon 2020, Horizon Europe, and the Digital Europe Programme) that create a single access point to trustworthy AI resources, supporting the development and deployment of AI. | |
| | • In April 2021, the **Artificial Intelligence Act** proposal was adopted by the Commission; a political agreement was reached in December 2023 and formal adoption is expected in Q2 2024. | |
| | • January 2024: Commission Decision establishing the European Artificial Intelligence Office. | |
| • Cyber | • European **network of Security Operations Centres (SOCs)** is being set up both via a call for expression of interest for Member States to join cross border SOCs and calls for grants to support the capacity building of SOCs, as well as via the upcoming Cyber Solidarity Act. | • Objective: Cyber, resilience |
| • Super- and quantum computing | • Two EuroHPC supercomputers were inaugurated in 2022 and are in the top five supercomputers worldwide. In June 2023, the EuroHPC JU signed hosting agreements for another six quantum computers.<br><br>• Significant progress in **quantum technologies flagship projects**. A report summarising the main project results from the ramp-up phase of the Quantum Flagship (2018-2021) is available here. | • Infrastructure/Target on quantum<br>• MCP |

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| • Quantum communication | • Deployment of the national **EUROQCI networks** started (secure quantum communication infrastructure spanning the whole EU, including its overseas territories). 26 projects were selected by the end of 2022 to foster the growth of a European quantum communication ecosystem and to develop the national quantum communication networks. | • Infrastructure/Target on quantum<br>• MCPs |
| • Blockchain | • The **European Blockchain Service Infrastructure** (*EBSI*) is piloting several use cases and mobilises an increasing number of actors.<br>• Digital Europe funded projects were launched in May 2023. | • Digitalisation of public services<br>• MCPs/EDICs |
| **European Strategies on Quantum and blockchain** (Q2 2020) | European **Blockchain Strategy published** in **January 2021** (potentially to be updated in 2023/24). | • Digitalisation of public services<br>• Infrastructure/Target on quantum<br>• MCPs/EDICs |
| **Revised EuroHPC Regulation** on **supercomputing** | The revised EuroHPC Regulation was **adopted** in **July 2021**.<br>In January 2024, the Commission proposed amendments to the EuroHPC Regulation, marking a significant shift with the establishment of 'AI Factories' - a new pillar within EuroHPC. Negotiations are ongoing and adoption is expected by end Q2 2024. | • Infrastructure |
| **Connectivity** | | |
| **Accelerating investments in Europe's Gigabit connectivity**, through: | In **February 2023**, the Commission presented a set of actions aimed at making Gigabit connectivity available to all citizens and businesses across the EU by 2030, including:<br>• A **proposal** for a **Gigabit Infrastructure Act where a political agreement was reached in February 2024 and adoption is scheduled for April 2024.** | • Infrastructure, target Connectivity |

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| | <ul><li>A **draft Gigabit Recommendation**, which seeks to provide guidance to National Regulatory Authorities,</li><li>An **exploratory consultation** on the **future of the connectivity sector** and its infrastructure (until May 2023).</li></ul> In February 2024, the Commission launched a broad consultation with the *White Paper - How to master Europe's digital infrastructure needs?* | |
| <ul><li>**Revision of the Broadband Cost Reduction Directive**</li></ul> | **Proposal** for a **Gigabit Infrastructure Act** adopted in **February 2023** (see above), reducing cost of deploying gigabit electronic communications networks and repealing the Broadband Cost Reduction Directive. | <ul><li>Infrastructure, target Connectivity</li></ul> |
| <ul><li>**Updated Action Plan on 5G and 6G**</li></ul> | <ul><li>Clear **5G and 6G deployment targets** were defined for 2030 and the trajectory to '5G everywhere' is agreed with the Council and Parliament.</li><li>Relevant **policy aspects** are addressed in the accompanying staff working document. Deployment frameworks are proposed in the (proposed) **Gigabit Infrastructure Act** (see above). Spectrum actions are being developed in the context of the Radio Spectrum Policy Programme.</li><li>**Smart Networks and Services Joint Undertaking** (*SNS JU*) **launched** in **November 2021** to support the development of Europe's technological capacities in 6G.</li></ul> | <ul><li>Infrastructure, target Connectivity</li></ul> |
| <ul><li>Roll-out of **5G corridors** for **connected and automated mobility**,</li></ul> | Corresponding to one of the areas of activity for the **multi-country projects**, identified in the **Digital Decade Policy Programme** and facilitated by the newly established Smart Networks and Services Joint Undertaking. Initial | <ul><li>Infrastructure, target Connectivity</li></ul> |

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| including railway corridors (2021-2030) (2021-2023) | funding under the first CEF Digital call of EUR 42 million, with the possibility of additional funding of around EUR 200 million under calls 2 and 3. | |

| **Cybersecurity** | | |
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| A **European cybersecurity strategy**, including the establishment of a **joint Cybersecurity Unit** <br><br> A **Review of the Security of Network and Information Systems (NIS) Directive** and giving a push to the single market for cybersecurity | • In **December 2020**, the European Commission and the High Representative of the Union for Foreign Affairs and Security Policy presented a new EU Cybersecurity Strategy (Joint Communication: The EU's Cybersecurity Strategy for the Digital Decade), followed by a Commission recommendation on building the Joint Cyber Unit dated **June 2021**. <br><br> • In **January 2023**, the new **NIS2 Directive** on measures for a high common level of cybersecurity across the Union **entered into force**. <br><br> • A proposal for a **Cyber Solidarity Act** aimed to strengthen capacities in the EU to detect, prepare for and respond to significant and large-scale cybersecurity threats and attacks, was adopted by the Commission in May 2023 and a political agreement was found in March 2024. <br><br> • A delegated act (C(2024) 1383) on the cybersecurity of cross-border electricity flows was adopted in March 2024. <br><br> • A proposal for a regulation on cybersecurity requirements for products with digital elements, known as the **Cyber Resilience Act**, adopted by the Commission in September 2022 had an agreement reached in November 2023 with the co-legislators. | • Objective: resilience, cyber |

| **Online Platforms** | | |
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| Initiative to **improve labour conditions of platform workers** (2021) | Package presented in **December 2021 and agreed by co-legislators in December 2023**, including:<br>• Commission **Communication** on better working conditions for a stronger social Europe: harnessing the full benefits of digitalisation; for the future of work,<br>• **Proposed Directive** on improving working conditions in platform work;<br>• **Draft Guidelines** clarifying the application of EU competition law to collective agreements of solo self-employed- people seeking to improve their working conditions, including those working through digital labour platforms. | • Human centred digital transformation |
| Explore **ex ante rules** to ensure that **markets characterised by large platforms** with significant network effects acting as gatekeepers, remain **fair and contestable** for innovators, businesses, and new market entrants (Q4 2020) | The **Digital Markets Act** entered **into force** on **1 November 2022.** | • Objective: efficient data infrastructure, Competitiveness and sustainability<br>• Targets: Digitalisation of business and public services |
| **New and revised rules** to deepen the **Internal Market for Digital Services**, by increasing and harmonising the **responsibilities of online platforms** and **information** | **Digital Services Act** entered **into force** on **16 November 2022**. | • Objective: human centred digital transformation<br>• Declaration on digital rights and principles |

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| **service providers** and reinforce the **oversight over platforms' content policies** in the EU. (Q4 2020, as part of the Digital Services Act package) | | |
| **Public sector** | | |
| A reinforced **EU governments interoperability strategy** to ensure coordination and common standards for secure and borderless **public sector data flows and services** (2021) | In line with the Commission work programme 2022, updated **strategy package adopted** in **November 2022,** including the **Interoperable Europe Act** proposal and an accompanying Communication. The act was adopted and entered into force in April 2024 provides for a new monitoring mechanism according to which the Commission shall monitor the progress of the development of cross border interoperable public services delivered or managed electronically and report regularly on the progress made. The Commission is working with the Joint Research Center (JRC) to support the transition. | • Objective on interoperability<br>• Digitalisation of public services, target on key public services |
| **Data** | | |
| A **European Data Strategy** to make Europe a global leader in the data-agile economy (February 2020) | Commission **Communication** on a **European strategy for data** dated **February 2020**. | • Objective: efficient data infrastructure, competitiveness and sustainability of EU's industry<br>• Targets: Digitalisation of businesses and public services |
| Announcing a **legislative framework for data governance** (Q4 2020) | The **Data Governance Act** entered **into force** in **June 2022**. | • Objective: efficient data infrastructure, competitiveness and sustainability of EU's industry<br>• Targets: Digitalisation of |

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| | | businesses and public services |
| Announcing a possible **Data Act** (2021) | **Data Act [proposed](#)** in **February 2022**, was adopted and entered into force in January 2024. | • Objective: efficient data infrastructure, competitiveness and sustainability of EU's industry<br><br>• Targets: Digitalisation of businesses and public services |
| **Competition law** | | |
| Ongoing **evaluation and review** of the fitness of **EU competition rules for the digital age** (2020-2023) | **State aid** - measures include the following:<br><br>• **General Block Exemption Regulation [amended](#)** in **March 2023** to support the twin transition to a green and digital economy.<br><br>• **Revised Broadband Guidelines** adopted in **December 2022** setting out rules under which the Commission will assess state aid measures notified by Member States to support the deployment and take-up of broadband networks in the EU.<br><br>• Evaluation of the **Technology Transfer** block exemption regulation ongoing. | • Objective: efficient data infrastructure, Competitiveness and sustainability of EU's industry |
| Launch of a **sector inquiry** (2020). | **Consumer IoT sector inquiry** launched in **July 2020**. **[Final report](#)** published in **January 2022**, together with an accompanying **[staff working document](#)**. | • Objective: efficient data infrastructure, Competitiveness and sustainability of EU's industry<br><br>• Targets: Digitalisation of business and public services |
| **Single Market** | | |
| Propose an **Industrial Strategy Package** putting forward a range | New **European Industrial Strategy Package adopted** in **March 2020**, including:<br><br>• [a new Industrial Strategy for Europe](#), | • Objective: efficient data infrastructure, Competitiveness and sustainability of EU's industry |

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| of actions to facilitate the transformation towards clean, circular, digital and globally competitive EU industries, including SMEs and the reinforcement of single market rules | • SME strategy for a sustainable and digital Europe (referring also to the network of **European Digital Innovation Hubs**, set up to support companies in their digital transformation, specifically in the areas of AI, blockchain, quantum, HPC or cybersecurity), <br>• an accompanying staff working document identifying and addressing barriers to the Single Market, and <br>• a long-term action plan for better implementation and enforcement of single market rules. | • Sustainable ecosystem of digital infrastructures, notably energy and resource efficient, <br>• Minimising their negative environmental impact, sustainable circular and climate neutral |
| **Digital Finance** | | |
| Create a **framework** to enable convenient, competitive and secure **Digital Finance** (Q3 2020), including: <br>• **Legislative proposals** on **crypto assets** <br>• **Legislative proposals** on **digital operational** and **cyber resilience** in the financial sector <br>• **Strategy** towards an **integrated EU payments market** that supports pan-European digital payment | New **Digital Finance Package**, including Digital Finance and Retail Payments Strategies and legislative proposals on crypto assets and digital resilience, proposals **adopted** in **September 2020**. | • Objective: efficient data infrastructure, Competitiveness and sustainability of EU's industry <br>• Sustainable ecosystem of digital infrastructures |

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| services and solutions | | |
| **Digital Identity** | | |
| **Revision of eIDAS Regulation** to improve its effectiveness, extend its benefits to the private sector and promote trusted digital identities for all Europeans (Q4 2020) | • Commission **proposal** for a **European Digital Identity Framework presented** in **June 2021 was endorsed by co-legislators in November 2023 and will enter into force in Q2 2024.**<br>• A first draft **Architecture and Reference Framework** for the European Digital Identity wallet published in **February 2023** | • Digitalisation of public services, eID |
| **Media & Audiovisual** | | |
| Media and Audiovisual **Action Plan** to support **digital transformation** and competitiveness of the audiovisual and media sector, to stimulate access to quality content and media pluralism (Q4 2020) | **Presented** in **December 2020**.<br><br>**European Media Freedom Act** proposed by the Commission in September 2022 and adopted in April 2024. | • Online participation in democratic life for all, fair and non-discriminatory conditions |
| **Health** | | |
| Promotion of **electronic health records** based on a common European exchange format to give European citizens secure access to and exchange of health data across the EU | • **Recommendation** on a European electronic health record exchange format to facilitate the cross border interoperability of electronic health records (EHRs) in the EU **presented** in **February 2019**.<br>• Exchange format structure specifications for two mainstream standards for the three Electronic Health Record EHR data categories delivered at the end of 2022.<br>• eHealth Network guidelines for | • Human centred digital transformation<br>• Digitalisation of public services, e-health target |

| | laboratory results and reports were published. | |
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| **European health data space** to improve safe and secure accessibility of health data allowing for targeted and faster research, diagnosis and treatment (from 2022). | • **Launched** in **May** 2022, with a **proposed regulation** to set up the European Health Data Space in order to unleash the full potential of health data (proposal currently under discussion among the co-legislators). | • Human centred digital transformation<br>• Digitalisation of public services, e-health target |
| **The international dimension - Europe as a global player** | | |
| A **Global Digital Cooperation Strategy** (2021) | TTC with USA and India, Digital partnerships with Japan, Korea and Singapore launched. Digital transformation is one of the main pillars in the Global Gateway. | |
| A **Digital for Development Hub** that will build and consolidate a whole-of-EU approach promoting EU values and mobilising EU member states and EU industry, Civil Society Organisations (CSOs), financial institutions, expertise and technologies in digitisation | **D4D Hub launched in December 2020**. It serves as a strategic multi-stakeholder platform that fosters digital cooperation between the Team Europe and its global partners. | |
| A **strategy for standardisation**, which will allow for the deployment of | Commission **presented** a new **Standardisation Strategy in February 2022** aimed at strengthening the EU's global competitiveness, enabling a resilient, green and digital | • Sovereignty, resilience<br>• Objective: Human centred digital transformation<br>• Competitiveness and sustainability of EU's |

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| interoperable technologies respecting Europe's rules, and promote Europe's approach and interests on the global stage (Q3 2020) | economy, and enshrining democratic values in technology applications. DG CNECT supports the implementation of the strategy across all its five pillars (e.g. identification of ICT standardisation needs with the ICT Standardisation Rolling Plan; support in modernising ETSI's governance; integration of standardisation activities in Digital partnerships and participation of EU experts in international ICT standardisation via [StandICT.eu](StandICT.eu); promotion of EU's standards and standardisation system globally through Horizon Europe; support to research, development and innovation through Horizon Europe, DEPI, CEF; strengthening of skills through [StandICT.eu EUOS academy](StandICT.eu EUOS academy)). | industry<br>• Cardinal point on skills, target basic skills<br>• Supporting international partnerships |
| Mapping of **opportunities and action plan** to **promote the European approach** in bilateral relations and multilateral fora (Q2 2020) | • **Digital Partnerships** with three key Indo-Pacific countries launched: **Japan** (May 2022), **Republic of Korea** (November 2022) and **Singapore** (February 2023), and Canada (November 2023).<br>• **EU-India Trade and Technology Council** launched in February 2023<br>• Fifth (January 2024) and sixth (April 2024) **EU-US Trade and Technology Council** focusing on a selected number of priority areas.<br>• Ongoing bilateral **digital dialogues** with key partner countries such as Brazil (March 2024), and Australia (June 2024).<br>• Ongoing discussions on the **Global Digital Compact**.<br>• **Other fora** include the OECD ministerial meeting held in May 2024, the G7 Digital Ministers' meeting held in Italy in March 2024, and the G20 Digital Economy Ministerial meeting to be held in Brazil in September 2024. | |

| Empowering people and society | | |
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| **Artificial Intelligence** | | |
| **White Paper on AI** setting out options for a legislative framework for trustworthy AI | **February 2020**: White Paper on AI **adopted**. | • Objective: Human centred digital transformation<br>• Digitalisation of business and public services |
| **Follow-up** to White Paper on AI **on safety, liability, fundamental rights and data** (**Q4 2020**) | In **April 2021**, as a follow-up to the White Paper on AI, the AI package was presented, including:<br>• a proposed **AI Act**, currently under negotiation (trilogues ongoing).<br>• an accompanying Communication on Fostering a European approach to Artificial Intelligence, and<br>• a revised Coordinated Action Plan on AI.<br>In **September 2022**, the Commission issued a proposal for an Artificial Intelligence Liability Directive. | • Objective: Human centred digital transformation<br>• Digitalisation of business and public services |
| **Skills** | | |
| A **Digital Education Action Plan** to boost digital literacy and competences at all levels of education (Q2 2020) | **Digital Education Action Plan** (2021-2027) **adopted** in **September 2020**.<br><br>**Cybersecurity Skills Academy proposed on 18 April 2023** | • Objective: skills, divides<br>• Cardinal point on skills, target basic skills |
| A reinforced **Skills Agenda** to strengthen digital skills throughout society and a reinforced **Youth Guarantee** to put a strong focus on digital skills in early career transitions (Q2 | • **New Skills Agenda presented** in **July 2020**.<br>• **Youth Guarantee reinforced** by Council **Recommendation** dated **October 2020**. | • Cardinal point on skills, target basic skills |

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| **Consumers** | | |
| Deliver a new **Consumer Agenda**, which will empower consumers to make informed choices and play an active role in the digital transformation (Q4 2020) | **Launched** in **November 2020**. Code of Conduct for Energy Smart Appliances. | • Objective: human centred digital transformation |
| **Democratic system** | | |
| **European Democracy Action Plan** to improve the resilience of our democratic systems, support media pluralism and address the threats of external intervention in European elections (Q4 2020) | **Presented** in **December 2020** Subsequently, several measures were adopted, including a Recommendation on the safety of journalists (September 2021) and an initiative to protect journalists and civil society against strategic lawsuits against public participation (SLAPPs) (April 2022). Projects with a focus on legal and practical assistance to journalists and media councils are ongoing. | • Online participation in democratic life for all, fair and non-discriminatory conditions |
| **Contributing to the green transition** | | |
| **Green** | | |
| **Destination Earth**, an initiative to develop a high precision digital model of Earth (a "**Digital Twin of the Earth**") that would improve Europe's environmental prediction and crisis | Work on the **Destination Earth platform** (including the first two digital twins for climate change adaptation and extreme weather events) **ongoing** (phase 1). During phase 1, the three main components (core platform, data lake and digital twins) will be delivered. | • Sustainable ecosystem of digital infrastructures, |

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| management capabilities (Timing: from 2021) | | |
| **Circular electronics initiative**, mobilising existing and new instruments in line with the policy framework for **sustainable products** of the forthcoming circular economy action plan, to ensure that devices are designed for durability, maintenance, dismantling, reuse and recycling and including a right to repair or upgrade **to extend the lifecycle of electronic devices and to avoid premature obsolescence** (2021) | The **new Circular Economy Action Plan** (**adopted** in March 2020) sets out further details on the actions under the Circular Electronics Initiative (within the responsibilities of several **DGs**), including: <br><br> • **Measures** for **mobile phones**, **tablets and laptops** for durability, reparability, energy efficiency, <br><br> • **Common charger proposed** in September 2021, <br><br> • **Legislative proposal on the Right to Repair announced** in September 2021 and adopted on 22 March 2023. | • Sustainable ecosystem of digital infrastructures, |
| **Initiatives** to achieve **climate-neutral, highly energy-efficient and sustainable data centres** by no later than 2030 and transparency measures for telecoms operators on their | Mix of existing instruments, reviews of existing legislation and new initiatives, including: <br><br> • the revision of the **Energy Efficiency Directive** (reporting and transparency requirement for the energy performance of datacentres), currently at the final stages of the trilogues, <br><br> • JRC's European **Code of Conduct** | • Sustainable ecosystem of digital infrastructures |

| environmental footprint | **for Energy Efficiency in Datacentres**, updated every year, | |
| | • **Action Plan on Digitalising the Energy System** (October 2022); CNECT commissioned a **study with JRC** to explore possibilities to develop common indicators for measuring the environmental footprint of electronic communications services | |
| | • Delegated Act of the **Taxonomy Regulation** (classifying investments in data centres adhering to the best practices of the JRC's European Code of Conduct for Energy Efficiency in Data Centres as "green"), | |
| | • **Ecodesign Regulation** on servers and data storage products; revision being prepared based on study commissioned by GROW, | |
| | • **EU Green Public Procurement criteria** for data centres, server and cloud services. | |

## Annex 2    Update on MCPs / EDICs

The Digital Decade Policy Programme 2030[1] (hereafter 'DDPP') translates the vision of a digitally enabled society into a concrete set of targets driving the deployment of the Union's strategic digital capacities. Together with the targets, the DDPP also establishes a **governance structure enhancing collaboration between the EU and its Member States to identify weaknesses and propose common solutions. Multi Country Projects (MCPs) are one of the building blocks of this governance structure**, providing a tool to drive the collective investment efforts in high priority areas identified in the Annex of the DDPP and reported below. In line with Article 11 of the DDPP, this Annex of the State of Digital Decade Report presents the progress of MCPs.

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**Multi-country projects:**

- Enable big projects that one single Member State could not develop on its own;

- Pool resources to achieve economies of scale and increase impact;

- Help reduce the digital divide between Member States;

- Support an interconnected, interoperable and secure Digital Single Market;

- Build ecosystems of excellence important enough to attract and retain talent;

- Implement flagship initiatives for which cooperation among Member States is important.

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The **MCP areas of activity** as listed in the Annex to the DDPP are: (1) European common data infrastructure and services; (2) Endowing the Union with the next generation of low power trusted processors; (3) Developing the pan-European deployment of 5G corridors; (4) Acquiring supercomputers and quantum computers, connected with the European high performance computing (EuroHPC); (5) Developing and deploying an ultra-secure quantum and space-based communication infrastructures; (6) Deploying a network of security operations centres; (7) Connected public administration; (8) European blockchain services infrastructure; (9) European digital innovation hubs (EDIHs); (10) High tech partnerships for digital skills; (11) Skills and training in cybersecurity; (12) Other projects which meet all the requirements set out in Article 11 and which become necessary to the achievement of the general objectives of the Digital Decade Policy Programme 2030 over time due to emerging social, economic or environmental developments.

*The above list of areas has remained stable in the past year, allowing Member States and the European Commission to progress on the several large-scale projects that were already advancing the Union's technological capacities in these sectors.*

Article 11 of the DDPP indicates the instruments through which MCPs can be implemented, i.e., Joint Undertakings (JUs), European Research Infrastructure Consortia (ERICs), Union's agencies, Important Projects of Common European Interest (IPCEIs) and independent actions of the Member States. *Since the adoption of the DDPP, collaboration between Member*

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[1] Decision (EU) 2022/2481 of the European Parliament and of the Council of 14 December 2022 establishing the Digital Decade Policy Programme, OJ L 323, 19.12.2022, p. 4 ('Digital Decade Decision').

*States and the Commission has stepped up through the new implementing mechanism introduced by the DDPP,* **namely the European Digital Infrastructure Consortium (EDIC)**. **This** new legal instrument combines the benefits of a rapid set up, flexible geometry and Member States' lead for its set up and operations.

As reflected in this Annex, a series of **successes** have been achieved since last year. In particular,

• Three EDICs have been formally established via Implementing Decision, namely the Alliance for Language Technologies EDIC, Local Digital Twins towards the CitiVERSE EDIC, and the EUROPEUM-EDIC.

• Further EDICs are currently in preparation and more initiatives are under consideration for becoming EDICs;

• In addition to the first IPCEI on Microelectronics and to IPCEIs in areas other than digital[2], two new IPCEIs in the field of digital technologies – the IPCEI on Next Generation Cloud Infrastructure and Services (IPCEI-CIS) and the IPCEI on Microelectronics and Communication Technologies (IPCEI-ME/CT) have been approved.

• The Chips JU and the EuroHPC JU are progressing well to deliver on their objectives.

## 1. EXISTING EUROPEAN DIGITAL INFRASTRUCTURE CONSORTIA (EDICS)

### 1.1. Alliance for Language Technologies (ALT-EDIC)

The **Alliance for Language Technologies EDIC** was officially set up by Commission Implementing Decision (EU) 2024/458 on 7 February 2024. submitted in December 2023 as one of the first EDIC applications. On 7 February 2024, the European.

Hosted by France, the ALT-EDIC counts (to the end of May 2024) sixteen Members States (Bulgaria, Croatia, Czechia, Denmark, France, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, The Netherlands, Poland, Slovenia, Spain). Six observing Member States are part of the consortium (Austria, Belgium, Estonia, Malta, Romania and Slovakia).

As per their statutes, the role of ALT-EDIC is to implement the MCP: Alliance for language technologies in the European Union – ALTEU. This falls under the area of activity listed in the DDPP Annex named **European common data infrastructure and services**. ALT-EDIC seeks to improve European competitiveness, increase the availability of European language data and uphold Europe's linguistic diversity and cultural richness. This will support the creation of Large Language Models (LLMs), advanced AI models that excel in understanding and generating human-like language. These capabilities, cutting across several applications, are key to the AI transformation. It is therefore important for the Union to ensure that these models embrace the linguistic diversity of the Union, and that initiatives to create and share available datasets for languages contribute to improving the capabilities of AI models in addressing the linguistic needs of the smaller Member States and language communities with limited language data and empowering users to engage with digital content in their native

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[2] Approved IPCEIs are: IPCEI on Batteries (2019), Second IPCEI on Batteries – EuBatin (2021), First hydrogen IPCEI – Hy2Tech (2022), Second hydrogen IPCEI – Hy2Use (2022), Third hydrogen IPCEI – HyInfra (2024). More information at: https://competition-policy.ec.europa.eu/state-aid/ipcei/approved-ipceis_en.

languages. The supply of high-quality language data will be key for Union's model developers.

As part of its efforts to support the **European Data Strategy**, the Commission will make available high-quality language data from European institutions covering all European languages.

Finally, as advanced models can effectively handle multiple types of data simultaneously (text, audio, video, images, code, etc), ALT-EDIC will also open up possibilities for more holistic and comprehensive AI applications across various domains.

In particular, the **ALT-EDIC's action plan** focuses on five thematic areas:

- **Data:** to develop a central platform for European language resources and collect high-quality data sets, building on the Language Data Space. Creating strategic data for low-resource languages will be a particular focus.

- **Existing language models:** to gather open-source models, fine-tune, reduce and optimise them for use in European SMEs, and provide methodologies for their evaluation, certification and normalisation.

- **New language models:** to launch new open-source models (including models with multimodal capabilities), efficiently coordinate access to EuroHPC computers for EU companies and industries and provide support to public and private experts to develop new models.

- **Evaluation, certification, and normalisation:** to provide methodologies to address potential discrimination and bias introduced by natural language processing.

- **Ecosystem:** to develop a start-up incubator for businesses participating in the EDIC, promote links between industry and research, act as a key player of the European coordinated plan on AI, bring together and strengthen the Language Technologies (LT) community, provide dedicated support to institutions for investing in LT, and develop cultural programmes based on AI for language.

Within 2024, the ALT-EDIC will start coordinating their participation in funding mechanism, seek data availability in each participating country, provide guidance to relevant institutions and companies interested in provisioning, deploying and using LLMs-based solutions, as well as seek practical steps to integrate the Language Data Space in their offered services.

## 1.2.   fiLocal Digital Twins towards the CitiVERSE - EDIC

The Local Digital Twins – CitiVERSE EDIC was established on 7 February 2024, with Implementing Decision (EU) 2024/459[3].

Spain is the hosting Member State. To the end of May 2024, eleven Member States are members (Belgium, Czechia, Hungary, Estonia, Spain, France, Luxembourg, Latvia, Portugal, Slovenia and Slovakia) and nine additional Member States are finalising membership

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[3] Commission Implementing Decision (EU) 2024/459 of 1 February 2024 on setting up the European Digital Infrastructure Consortium for Networked Local Digital Twins towards the CitiVERSE (LDT CitiVERSE EDIC).

negotiations (Austria, Denmark, Finland, Germany, Italy, Sweden, Poland, The Netherlands). 32 cities are expected to join this EDIC as full members.

The LDT-CitiVERSE-EDIC **delivers on the Commission's priorities concerning the digital and green transition and the New European Bauhaus**. This EDIC will contribute to **European common data infrastructure and services** area of activity, with a focus on the transversal Data Space for Smart Communities. It will ensure an open digital infrastructure environment, foster an industrial ecosystem for digital twins and a market for EU SMEs and industry. It will also perform targeted training activities for digital smart city solutions. Strategic business and policy priorities for the LDT CitiVERSE EDIC concentrate on:

- **Technical developments:** design, development, deployment, and scaling-up of EU infrastructures for digital twins; implement the common EU architecture blueprint for the Smart Communities Data Space; develop Artificial Intelligence-based solutions for Smart Communities; establish sustainable mechanisms for the EU infrastructure; creation and animation of an open-source community for Smart Communities.

- **Cooperation:** determine opportunities for Member States digital transformation with support of LORDIMAS; implement an EU-based data strategy and common governance; define funding schemes and draft joint procurements; develop an active digital strategy; cooperate with other relevant EU initiatives (e.g., EDIHs, Scalable Cities, EU mission 100 climate neutral cities, eGovernment, eID, EU Product passport).

- **Communication and dissemination:** capacity-building and concerted actions; assistance to cities in the process of introducing and implementing Digital Twins; transfer of knowledge in relation to scale-up solutions across Europe; share expertise and coordinate mechanisms for an interoperable EU (including standardization).

The city of Valencia will be the seat of the EDIC and the process for registering the legal entity will be finalised before the end of 2024. With a number of new Member States and tens of cities expected to enrol, this initiative will become truly pan-European common digital infrastructure serving Smart Communities.

The initial roadmap for the LDT-CitiVERSE-EDIC includes 2 action groups: Infrastructure and Projects.

The **Infrastructure group** will develop the initial business plan after an agreement of the main infrastructures relevant to the LDT-CitiVERSE-EDIC. It will collaborate with the ongoing procurements for the EU LDT Toolbox, and focus on synergies with existing official networks of the Commission, the Barcelona Supercomputing Centre [4], the European Committee of the Regions (CoR) [5], Living-in.EU [6] and with other EDICs.

The **Projects group** will be coordinating efforts in projects relevant for the EDIC and prepare joint proposals to calls for proposals, in particular from the Digital Europe Programme (DEP), and ensure an inclusive approach of member cities from the EDIC.

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[4] https://www.bsc.es/.

[5] https://cor.europa.eu/en.

[6] https://living-in.eu/.

A formal launch event of the LDT-CitiVERSE-EDIC will be organized in Valencia.

## 1.3. European Digital Infrastructure Consortium for European Blockchain Partnership and European Blockchain Service Infrastructure (EUROPEUM-EDIC)

The EUROPEUM-EDIC was established on 23 May 2024 with Implementing Decision (EU) 2024/1432[7].

The seat of the EDIC will be in Belgium. To the end of May 2024, nine Member States are members of the EDIC (Belgium, Cyprus, Croatia, Greece, Italy, Luxembourg, Romania, Portugal, Slovenia). Poland is committed to joining soon. Several other Member States that are part of the European Blockchain Partnership have indicated the intention of applying to become members or observers.

The mission of EUROPEUM-EDIC is to **develop the European Blockchain Services Infrastructure and operate it to deliver EU-wide cross-border services**, in particular public services. The EDIC will thus contribute to **European blockchain services infrastructure** MCP area of activity. EUROPEUM-EDIC will also support **cross-border cooperation between public authorities** on decentralised technologies, **facilitate the interoperability of solutions with other technologies**, including at protocols, smart contracts, and applications level, and **contribute to better conditions for innovation**.

It will provide a sovereign infrastructure for underpinning cross border, national or local services. It will help reinforcing public services and the implementation of policies by providing capacities and new sharing and verifying models for a large range of attestation, certification or credentials, for instance in the areas of education. It will support the creation of new type of registries for businesses or organisations. For instance, EBSI will support in 2024/25 the operational verification of rights associated to brand owners for anticounterfeiting purposes, the model developed can apply to various other applications like the implementation of digital product passports.

## 2. EUROPEAN DIGITAL INFRASTRUCTURE CONSORTIA (EDICs) IN PREPARATION

### 2.1. Progress towards setting up the EDIC for Mobility and Logistics Data

To the end of May 2024, ten Member States (Austria, Bulgaria, Germany, Finland, France, Italy, Luxembourg, The Netherlands, Slovakia, Spain) are developing the Statute of the EDIC for **Mobility and Logistics Data EDIC** within an informal Working Group. Belgium, Romania and Sweden have expressed an interest in participating to the discussions. Formal application is expected in Q3 or Q4 of 2024. At this stage The Netherlands is expected to host the EDIC.

The EDIC for Mobility and Logistics Data aims to contribute to the effective implementation of the MCP area of activity on **European common data infrastructure and services**, **with a focus on the mobility and transport sector**. In line with the objectives of the common European mobility data space, the EDIC aims to **connect the multiple data initiatives in the mobility sector to ensure interoperability and the long-term sustainability of common**

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[7] Commission Implementing Decision (EU) 2024/1432 of 21 May 2024 setting up the European Digital Infrastructure Consortium for European Blockchain Partnership and European Blockchain Service Infrastructure (EUROPEUM-EDIC).

**infrastructure**. The EDIC intends to allow the coordination and alignment on a common technical framework among its members and support large cross-border use cases based on data sharing, in areas such as freight visibility in multimodal logistics chains. In addition, it would support stakeholders in the sector by providing guidance and tools.

## 2.2. Progress towards setting up the Cybersecurity Skills Academy EDIC

To the end of May 2024, eight Member States (Austria, Cyprus, Croatia, Greece, Italy, The Netherlands, Portugal, Slovenia) are developing the Statute of the **Cybersecurity Skills Academy EDIC** (possibly changing the name of the initiative to Cybersecurity Skills Coalition EDIC) within an informal Working Group. The expected chair for this EDIC is Greece.

The Cybersecurity Skills Academy EDIC intends to contribute towards **addressing cybersecurity skills gap in the Member States**, thereby reinforcing the competitiveness, growth, and resilience of the EU. This commitment is articulated in the Communication of the Commission to the European Parliament and the Council 'Closing the cybersecurity talent gap to boost the EU's competitiveness, growth, and resilience ('The Cybersecurity Skills Academy')' [8]. The EDIC would be dedicated to **supporting key entities, including the European Commission, ENISA, and the European Cybersecurity Competence Centre (ECCC), in the effective implementation of the Cybersecurity Skills Academy initiative**. The EDIC also aims to undertake proactive actions to promote the upskilling and reskilling of professionals, aligning with the cybersecurity needs and regulatory conformity of European industries and national administrations.

## 2.3. Progress towards setting up the Genome EDIC

On 31 March 2023 the special group of national representatives in the **1+ Million Genomes initiative** endorsed the principal approach of creating an EDIC to operate the future European Genomic Data Infrastructure (GDI).

To the end of May 2024, nineteen Member States (Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Italy, Lithuania, Luxembourg, The Netherlands, Portugal, Romania, Spain and Sweden) are developing the Statute of the **Genome EDIC** within an informal Working Group

Luxembourg offered provisionally to host the EDIC. The governmental group in Pillar I of the GDI project, gathering representatives from more than 20 Member States, acts as the EDIC informal working group. Besides the reflection on the requirements and features of the future EDIC, the group works on the data governance and legal arrangements for the European Genomic Data Infrastructure and its alignment with the European Health Data Space. In March 2024, a task force within the WG was launched and started to work on the EDIC application with a view to submitting it later this year.

The 1+MG initiative aims to **enable secure access to genomics and the corresponding clinical data across Europe for better research, personalised healthcare and health policy making**. The GDI project co-funded under the Digital Europe Programme (DEP) will

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[8] Commission Communication 'Closing the cybersecurity talent gap to boost the EU's competitiveness, growth and resilience' ('The Cybersecurity Skills Academy'), COM/2023/207 final.

establish the **European Genomic Data Infrastructure** by 2026. Already by the end of 2024 at least five countries will achieve technical capability to provide secure access to genomic datasets and linked health data. The proof-of-concept of the data infrastructure was presented in 2023. The future EDIC aims to ensure sustainable operation of the European Genomic Data Infrastructure in accordance with the agreed data governance and a mandate formulated by the Member States in the EDIC statutes. The Genome EDIC should contribute to the MCP area of activity of the European common data infrastructure and services.

## 2.4. Progress towards setting up the Connected Public Administration EDIC (IMPACTS-EDIC)

To the end of May 2024, ten Member States are developing the Statute of the IMPACTS-EDIC (Austria, Croatia, Greece, Finland, Hungary, Lithuania, Luxembourg, Poland, Romania and Slovakia) within an informal Working Group. Formal application is expected to be submitted by the end of Q2 2024. Greece is expected to be hosting this EDIC.

The IMPACTS-EDIC aims at **connecting Public Administrations for providing advanced Public Services across Europe** – in line with the objective of the Interoperable Europe Act that calls for strengthened collaboration on interoperability in the EU – and **promoting Digital Ready Policy Making**. The IMPACTS-EDIC intends to focus on developing solutions for public administrations that will help implementing EU policies and that can be further disseminated through the future Interoperable Europe governance established by the Interoperable Europe Act[9]. In addition, the IMPACTS-EDIC aims to contribute to the **priorities of the Interoperable Europe Agenda** by providing solutions and implementing actions that will be in line with the agenda. IMPACTS-EDIC contributes to the **Connected Public Administration** MCP area of activity.

Several working streams aim at contributing to the creation of innovative public services and new reusable interoperable solutions exploiting existing European and National initiatives, namely:

- European Trans-border Information Architecture (BOARD-IA)

- Data analytics platform for public administration in the EU

- Platform for Co-creation of cross border public services

- Regulatory Sandbox for Data Exchange among Member States

- Forthcoming eIDAS Regulation topics e.g., European Digital Identity Wallet (EUDIW)

- Secure & interoperable cross-border network for exchange of data.

## 2.5. The informal working group is advancing in the drafting the Statute for the EDIC. Progress towards setting up the Digital Commons EDIC

To the end of May 2024, eleven Member States (Estonia, France, Germany, The Netherlands, Slovenia as members and Austria, Belgium, Czechia, Denmark, Italy, Poland as observers) are engaging in discussions on the set up of a Digital Commons EDIC within an informal

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[9] Regulation (EU) 2024/903 of the European Parliament and of the Council of 13 March 2024 laying down measures for a high level of public sector interoperability across the Union (Interoperable Europe Act) OJ L, 2024/903, 22.3.2024.

Working Group. France and The Netherlands are potential hosts for this EDIC and are currently co-chairing the informal Working Group.

The Digital Commons EDIC aims to pursue overall objectives: (i) **Create a strong public-civic-private partnership**; (ii) **Promote the use and creation of digital commons**; (iii) **Improve the competitiveness of digital commons to enable large-scale adoption**; (iv) **Enhance the public contribution to strategic commons**. The working group is also seeking to identify further missions such as acting as a one-stop shop for the different stakeholders such as the Open-Source communities, developers but also adopters and promote the use of Open-Source digital solutions and become an incubator for the development and maintenance of strategic digital commons.

The Digital Commons EDIC aims to contribute to the following MCP areas of activity: European common data infrastructure and service; Connected public administration; European digital innovation hubs (EDIHs) and possibly also to other areas.

## 2.6. Progress towards setting up the Cancer Image Europe (EUCAIM) EDIC

To the end of May 2024, eleven Member States (Croatia, Greece, France, Italy, Latvia, Portugal, Spain as members and Germany, The Netherlands, Poland and Sweden as observers) are engaging in discussions on the set up of a EUCAIM EDIC within an informal Working Group. Spain is a candidate host for this EDIC and is currently chairing the informal Working Group.

The EUCAIM EDIC aims to contribute to the MCP area of activity of European common data infrastructure and services. The EUCAIM project co-funded at 50% from the Digital Europe Programme (DEP) aims to establish the **Cancer Image Europe platform**. It will be a cross-border, interoperable, and secure infrastructure which will link and **make available to clinicians, researchers and innovators large amounts of cancer images data and linked clinical information**. Its goal is to **support the development and benchmarking, testing and piloting of innovative AI-based tools for personalised cancer diagnosis and treatment**.

The first version of the Cancer Image Europe infrastructure was delivered in September 2023. A pilot infrastructure with prototype federated learning will be available by the end of 2024, ready for federation of new cancer image databases from additional sites and countries. A final release of the platform is planned for the end of 2025. Establishing an EDIC would ensure sustainable operation of the Cancer Image Europe data infrastructure beyond the EUCAIM project end. This solution would also enable alignment and connection with the forthcoming **European Health Data Space**.

## 2.7. Progress towards setting up the Agri-Food EDIC

To the end of May 2024, eleven Member States (Austria, Belgium, Croatia, France, Germany, Italy, The Netherlands, Poland, Romania, Spain, Sweden) are progressing on the first draft of the Statute for the Agri-Food EDIC within an informal Working Group. France is the candidate host for this EDIC and is currently chairing the informal Working Group. More countries have expressed interest in joining this EDIC.

The Agri-Food EDIC is foreseen to seize the opportunities of digital and data technologies to **reduce administrative burden in the agri-food sector**; **strengthen competitiveness and**

**sustainability performance of the sector**, and to **enhance data availability and sharing**. It is envisaged to capitalise existing and evolving assets, including the forthcoming **Common European Data Space**. The Agri-Food EDIC will contribute to the MCP area of activity of European common data infrastructure and services.

## 2.8. Possible setting up of the EU Startup Nations Alliance (ESNA) EDIC

The **EU Startup Nations Standard (EU SNS) initiative** was launched in March 2021 by the Commissioner for Internal Market with the aim of mobilising Member States to deliver optimised framework conditions and regulatory environment for startups. Member States take action under their national competencies in eight areas of policy (the so-called 8 "standards of excellence"), as set out in the political declaration for the EU Startup Nations Standard signed by Ministers from 27 countries (all Member States except Hungary, and Iceland) in March 2021[10]. To move from its political aspirations to an operational reality a legal entity – the **'Europe Startup Nations Alliance' (ESNA)** - was legally established in December 2021 under Portuguese law.

ESNA is a first-of-a-kind Member State-driven approach **addressing the fitness of the regulatory framework for startups**. ESNA has a full-time management board and EUR 8,5 million funding for its first 4 years of operations. To date, 18 of the 27 signatory countries have completed the formal process for joining ESNA. ESNA's 18 member countries now represent 73% of the EU's GDP, 71% of its population and are home to 64% of the Union's unicorns. The five remaining signatory countries are making good progress towards joining ESNA. Discussions have now been ongoing about a **possible transformation of ESNA into an EDIC**. If set up, the EDIC would be a candidate to contribute to MCP are of other projects, under point (l) of the DDPP Annex.

## 3. IMPORTANT PROJECTS OF COMMON EUROPEAN INTEREST (IPCEIS)

### 3.1. IPCEI on Next Generation Cloud Infrastructure and Services (IPCEI-CIS)

In December 2023, the Commission approved the IPCEI on Next Generation Cloud Infrastructure and Services (IPCEI-CIS). This is composed of 12 Member States (Belgium, Germany, Spain, France, Croatia, Hungary, Italy, Luxembourg, Latvia, Netherlands, Poland, Slovenia) and more than a hundred private companies and Research and Technology Organisations (RTOs).

The IPCEI-CIS aims at **setting-up the first-ever cloud-to-edge computing continuum spanning across Europe via the development of interoperable and accessible European data processing technologies**. Such a computing continuum is expected to be open-source, highly secure and energy efficient. The research, development and first industrial deployment phases will run between 2024 and 2031, with timelines varying depending on the project and the companies involved.

The IPCEI-CIS will be a **key initiative for making available the technology that is necessary to achieve in particular two of the Digital Decade's targets**: 75% of EU companies using Cloud, AI or Big Data; and 10,000 climate-neutral highly secure edge nodes

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[10] https://startupnationsstandard.eu/files/SNS-declaration.pdf.

deployed across Europe by 2030. It will also realise the ambition of the set-up of a **High Impact Project of the EU Data Strategy in the areas of cloud-edge computing**.

A total amount of about EUR 1.2 billion of public investment, expected to trigger an additional EUR 1.4 billion of private investment in return is invested in the IPCEI-CIS.

## 3.2. IPCEI in Microelectronics (IPCEI-ME)

The first IPCEI in Microelectronics has been approved in December 2018. It involves 32 participants from the original proposers, Germany, France, Italy and the United Kingdom, plus Austria which joined the IPCEI-ME in July 2019.

The project's overall objective is to **enable research and develop innovative technologies and components** (e.g., chips, integrated circuits, and sensors) **that can be integrated in a large set of downstream applications**. These include consumer devices, like home appliances and automated vehicles, and commercial and industrial devices, for example the management systems for batteries used for electric mobility and energy storage. The project participants focused their work on five different technology areas developing: (1) **new solutions to improve the energy efficiency of chips**; (2) **new technologies of power components**, for smart appliances as well as for electric and hybrid vehicles; (3) **new optical, motion or magnetic field sensors with improved performance and enhanced accuracy**; (4) **advanced optical equipment for future high-end chips**; and (5) **new compound materials beside silicon and devices suitable for more advanced chips**.

The overall State-Aid funding is around EUR 1.9 billion with additional EUR 6.5 billion of private investment. Companies from Germany, France, Austria and the United Kingdom completed the activities of their relevant projects in 2022 and 2023. The last project of this IPCEI is expected to end in December 2024.

A number of Member States and companies that participated in the IPCEI-ME are now involved in the IPCEI-ME/CT.

## 3.3. IPCEI on Microelectronics and Communication Technologies (IPCEI-ME/CT)

In June 2023, the Commission approved the IPCEI-ME/CT jointly prepared and notified by 14 Member States (Austria, Czechia, Finland, France, Germany, Greece, Ireland, Italy, Malta, the Netherlands, Poland, Romania, Slovakia and Spain). The IPCEI involves 68 projects from 56 companies which will closely cooperate with more than 40 associated companies, also from additional Member States (Belgium, Hungary, Latvia, Portugal, and Slovenia) and Norway, thus summing up to 20 countries involved in Europe. In addition, around 600 indirect partners, companies or organisations, hold collaboration agreements with one or more direct participants of this IPCEI ME/CT and will therefore benefit from its dissemination activities.

The IPCEI ME/CT concerns **research and development projects covering microelectronics and communication technologies across the whole value chain from materials and tools to the chip designs and novel manufacturing processes**. These projects aim at enabling the digital and green transformation by creating innovative microelectronics and communication solutions, and by developing energy-efficient and resource-saving electronics systems and manufacturing methods. **They will contribute to the technological advancement of many sectors, including communications (5G and 6G), autonomous driving, artificial**

**intelligence and quantum computing**. The first reporting to the Commission of the ongoing activities is due in July 2024.

Member States will provide up to EUR 8.1 billion in public funding, which is expected to unlock additional EUR 13.7 billion in private investments.

## 4.    JOINT UNDERTAKINGS

### 4.1.    Chips Joint Undertaking (JU) (former Key Digital Technologies (KDT) JU)

The Chips JU is a joint undertaking set up under Council Regulation (EU) 2021/2085[11] and its amendment Council Regulation (EU) 2023/1782[12]. It entered into force at the same time as the **Chips Act** on 21 September 2023. With its entry into force, the former **KDT JU** (which provided extensive support for industrially-driven research, technology development, and innovation in the area of electronic components and systems) was **renamed as the Chips JU and its scope was enlarged in order to implement the main part of the Chips for Europe Initiative** set up under the Chips Act, namely: **setting up a chips Design Platform**; **enhancing existing and developing new advanced pilot lines**; **building capacities for accelerating the development of Quantum chips and associated semiconductor technologies**; and **establishing a network of competence centres across the Union**.

The Chips JU is a tripartite partnership composed of the **Commission** (representing the Union), **participating states** (Member States and countries associated to Horizon Europe (HE) and/or Digital Europe Programme (DEP)) **and private members**, i.e., three industry associations: Aeneas, Inside and European Platform on Smart System Integration (EPoSS). It receives funding from Horizon Europe (up to EUR 2.725 billion) and Digital Europe Programme (up to EUR 1.450 billion). Participating states contribute a commensurate amount while the private members commit to at least EUR 2.5 billion.

Regarding milestones, on 1 December 2023, the Chips JU launched the first call related to the Chips for Europe Initiative with EUR 1.67 billion of EU funding (expected to be matched by funds from participating states to reach EUR 3.3 billion, plus additional private funds). In 2024, further calls (e.g., on the Design Platform, competence centres, etc.) are expected to be launched as well.

The Chips JU's role will be **key to achieve the Chips Act's objectives**, in particular, to **bridge the gap between research, innovation and production, thereby facilitating the commercialisation of innovative ideas**.

### 4.2.    European High Performance Computing Joint Undertaking (EuroHPC)

The EuroHPC JU is the initiative making it possible to realise MCP initiatives in the area of supercomputing and quantum computing, **developing, deploying, extending, and maintaining in the EU a world-leading federated, secure, and hyper-connected supercomputing, quantum computing, service, and data infrastructure**. **The EuroHPC JU enables Member States to coordinate their supercomputing strategies and pool their**

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[11] Council Regulation (EU) 2021/2085 of 19 November 2021 establishing the Joint Undertakings under Horizon Europe and repealing Regulations (EC) No 219/2007, (EU) No 557/2014, (EU) No 558/2014, (EU) No 559/2014, (EU) No 560/2014, (EU) No 561/2014 and (EU) No 642/2014.

[12] Council Regulation (EU) 2023/1782 of 25 July 2023 amending Regulation (EU) 2021/2085 establishing the Joint Undertakings under Horizon Europe, as regards the Chips Joint Undertaking.

**investments together towards acquiring supercomputers and/or quantum computers, as well as deliver concrete services across Europe** to a wide range of academic, industrial, SME and public users with applications that impact both our everyday life and the challenges affecting the planet as a whole. This approach is necessary, as the acquisition and ownership of supercomputers and quantum computers requires **high levels of investments** from both the public and the private sectors. The list below provides an estimation of the identified costs:

- Mid-range supercomputer – level of investment per system: EUR 30 - 50 million.

- High-end supercomputers – level of investment per system: EUR 150 - 500 million.

- Quantum computers (as standalone machines or as accelerators of supercomputers) – level of investment per machine: EUR 50 - 250 million.

In addition, **further investments will be needed to ensure secure and reliable connectivity** with the EuroHPC extreme-bandwidth communication network, to support HPC national competence centres and skills, and to develop advanced applications requiring supercomputing in domains such as large language models, health (cancer diagnosis, new drugs, etc.), disaster prediction and management, engineering, digital twins of the human and its organs and of the Earth, and many more.

The EuroHPC JU has already procured **eight supercomputers**, located across Europe. Six supercomputers are now operational: LUMI in Finland, LEONARDO in Italy, Vega in Slovenia, MeluXina in Luxembourg, Discoverer in Bulgaria, and Karolina in the Czech Republic. Two more supercomputers - MareNostrum 5 in Spain and Deucalion in Portugal – were also inaugurated in 2023.

These projects depend on a high level of multi-country participation: e.g., LUMI in Finland with ten countries and a total investment of EUR 144 million; Leonardo in Italy with six countries and a total investment of EUR 120 million; and Mare Nostrum 5 in Spain with three countries and a total investment of EUR 151 million.

In addition, **seven additional sites for supercomputers** – in Germany, France, Greece, Sweden, Hungary, Ireland, and Poland - **have already been announced by the EuroHPC JU**, with two of them due to become Europe's first and second exascale supercomputers: JUPITER, which will be hosted in the Jülich Supercomputing Centre in Germany, and the Jules Verne consortium's supercomputer, to be hosted at the French Alternative Energies and Atomic Energy Commission in France.

In October 2022 the EuroHPC also announced **six sites to host quantum computers** (in Czechia, Germany, Spain, France, and Poland and in Italy) to be integrated with existing supercomputers, with a total co-investment of EUR 100 million, 50% of which comes from 17 participating states. The LUMI-Q Consortium in Czechia is the largest consortium of the six involved, bringing together 14 partners from nine participating states. The public procurement tenders for the Polish and Czech systems were published in the fourth quarter of 2023, and the remainder in the first quarter of 2024.

**These EuroHPC supercomputing systems will increase by at least a factor of four the available computing power of the EU that will be available to EU users from academia, industry, and the EU public sector**. The Joint Undertaking will deploy a fully hyperconnected and federated advanced computing infrastructure, providing end- to-end

connectivity, performance, security, and resilience which will underpin the development of a federated ecosystem. Additionally, in line with the amendment to the Regulation establishing the Joint Undertaking proposed by the Commission in January 2024[13], **the EuroHPC JU will support the further development of a highly competitive and innovative AI startup and research ecosystem in Europe**, including the development and uptake of European AI solutions, by establishing and operating AI Factories. The AI Factories will be the basis for further multi-country projects in the area of supercomputing.

**The success of these multi-country projects relies on a strong long-term political and financial commitment of public and private partners** towards a clear and ambitious pan-European strategy driven by the Union, defining concrete goals and impact in key European policies under one single governance and legal instrument that has the capacity to mobilise and pool the necessary critical mass of investments (national, EU and private) on the whole spectrum of the HPC ecosystem.

Since the launch of the **EuroQCI Declaration** in June 2019, the Commission has been working with the Member States and with the European Space Agency (ESA) towards the **deployment of a secure quantum communication infrastructure - the European Quantum Communication Infrastructure (EuroQCI) initiative** - spanning the whole EU, including its overseas territories. **Developing and deploying an ultra-secure quantum and space-based communication infrastructures** is one of the DDPP areas of activity for MCPs.

The EuroQCI will consist of a **terrestrial component building on new and/or existing fibre communication networks linking strategic sites at national and cross-border level, complemented by a space component to cross-link and cover the whole EU**. Since 2023, EuroQCI has been part of **IRIS², the Union Secure Space-based Connectivity Programme**[14].

26 national projects, supported by the Digital Europe Programme (DEP), have been underway since January 2023, and have the aim of delivering the design and deployment of the national quantum communication networks that will form the basis of the EuroQCI's terrestrial segment. DEP is also funding a coordination and support action,[15] a set of industrial projects to develop and mature the key technological building blocks that the EuroQCI will need, with the broader goal of expanding Europe's quantum communication ecosystem, and the construction and deployment of a testing and evaluation facility for technologies necessary for quantum key distribution, the first service to be offered by the EuroQCI. A total of EUR 170 million from DEP will fund all these projects collectively.

2024 sees a CEF Digital call planned, with a total budget of EUR 90 million, to support projects working on cross-border links between national networks and on interconnections with the EuroQCI's space segment. To make the latter a reality, the Commission is currently working with the ESA on the specification of a **first-generation constellation of EuroQCI satellites**. This will build on the first prototype satellite Eagle-1, developed by ESA and an

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[13] Proposal for a Council Regulation amending Regulation (EU) 2021/1173 as regards an EuroHPC initiative for start-ups to boost European leadership in trustworthy Artificial Intelligence, COM(2024) 29 final/2.

[14] Regulation (EU) 2023/588 of the European Parliament and of the Council of 15 March 2023 establishing the Union Secure Connectivity Programme for the period 2023-2027, OJ L 79, 17.3.2023, p. 1.

[15] https://petrus-euroqci.eu/.

industrial consortium and planned to be launched in late 2025 or early 2026. Additional funding for the EuroQCI is provided by Horizon Europe, as well as ESA and national sources. In the future, Commission funding for the EuroQCI will come from the budget of IRIS[2] and be covered by its work programmes.

Now that EuroQCI is part of IRIS[2], governance is provided by working groups reporting to the EU Space Programme Committee. Within these groups, Member State representatives advise the Commission on the initiative's development and deployment, ensuring that all stakeholders can shape it and that it continues to make progress as a key element of the **Secure Connectivity Programme**.

## Annex 3    Analysis of national Digital Decade strategic roadmaps

## 1.    INTRODUCTION

Decision (EU) 2022/2481 establishing the 'Digital Decade Policy Programme 2030' (DDPP)[16] lays down a joint commitment from The European Parliament, the Council, the Commission and the Member States (MS) to accelerate the European Union's (EU) digital transformation along a common vision. To achieve this, it sets out a structured cooperation framework between the Commission and the Member States.

As part of this governance mechanism, Member States are requested to submit national Digital Decade strategic roadmaps ('national roadmaps'), setting out their respective contributions to the objectives and targets of the Programme.

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*__Article 7 of the Decision establishing the Digital Decade Policy Programme 2030__*

*National Digital Decade strategic roadmaps.*

*1. By 9 October 2023, each Member State shall submit to the Commission its national roadmap. The national roadmaps shall be consistent with, and shall contribute to, achieving at Union level the general objectives and the digital targets. Member States shall take into account relevant sectoral initiatives and foster consistency with them.*

*2. **Each national roadmap shall comprise the following**:*

*__(a) the main planned, adopted and implemented policies, measures and actions that contribute to achieving the general objectives and the digital targets;__*

*__(b) national projected trajectories contributing to achieving the relevant digital targets set out in Article 4 that are measurable at national level, while the regional dimension is reflected where possible in the national roadmaps;__*

*__(c) the timing and expected impact on achieving the general objectives and the digital targets, of the planned, adopted and implemented policies, measures and actions referred to in point (a).__*

*3. The policies, measures and actions referred to in paragraph 2 shall relate to one or more of the following:*

*(a) directly applicable Union or national law;*

*(b) one or more commitments have been undertaken to adopt those policies, measures or actions;*

*(c) the public financial resources allocated;*

*(d) the human resources mobilised;*

*(e) any other critical enablers related to achieving the general objectives and the digital targets.*

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[16] Decision (EU) 2022/2481 of the European Parliament and of the Council of 14 December 2022 establishing the Digital Decade Policy Programme, OJ L 323, 19.12.2022, p. 4 ('Digital Decade Decision').

> *4. In their national roadmaps, Member States shall provide an estimate of the investments and resources needed to contribute to achieving the general objectives and the digital targets, as well as a general description of the sources of those investments, either private or public, including, where applicable, the planned use of Union programmes and instruments. The national roadmaps may include proposals for multi-country projects. [...]*

The national roadmaps are crucial for an efficient and effective cooperation between the Commission and the Member States. They adapt the EU's vision and direction for digital transformation to the specific context of each Member State, inviting Member States to develop a comprehensive and coherent view covering the period up to 2030.

Following the adoption of the Decision establishing the Digital Decade Policy Programme 2030, the Commission provided Member States with guidance and support to prepare their national roadmaps, notably during Digital Decade Board meetings, in the preparation of their national roadmaps. The objective was to ensure a consistent and comparable approach to implementing the Digital Decade decision and that the information in the roadmap is of high quality, to foster stakeholder engagement in the Member States, and to facilitate the subsequent exchanges between and among the Commission and the Member States.

The **Guidance to the Member States on the preparation of the national Digital Decade strategic roadmaps**[17] was adopted by the Commission on 28 June 2023. It took form of a Communication setting out a suggested common structure for national roadmaps and, in particular, common elements to be included in all national roadmaps.

The guidance includes a detailed description of the elements to be included in national roadmaps in line with the Digital Decade Policy Programme Decision and how the commitments made by Member States are to be implemented and monitored, namely:

- The **scope and general principles** of the national roadmaps: the fact that national roadmaps constitute a crucial tool for the coordination and consistency of the relevant digital policies at Member States level and subsequently at EU level; the need for MS to adopt a strategic and comprehensive approach to digital transformation, aligning the EU's approach and vision with the national context; the need to include policies, measures and actions – all with the expected impact and timings outlined – that can enable each Member State **to contribute to the achievement of general objectives and digital targets at EU level**, in particular to deliver on national trajectories; the invitation to report on actions carried out to promote the **European Declaration on Digital Rights and Principles for the Digital Decade**; the need to feed into the **European Semester** particularly on reforms that contribute to a successful digital transformation by 2030 (notably to take into consideration the latest country-specific recommendations) and to be consistent with the Recovery and Resilience Plans (RRP); the need to cover **the period until the end of 2030**.; the invitation to propose new policies, measures and actions in view of the **findings that include recommended actions in the Annual Report on the State of the Digital Decade**.

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[17] Commission Communication 'Guidance to the Member States on the preparation of the national Digital Decade strategic roadmaps', C(2023) 4025 final.

- **Analysis of the state of play of the digital transformation in each Member State**, including the Member State progress on its digital transformation, in particular the general objectives and the digital targets to be reached by 2030, and **the key factors behind its performance,** (digital ecosystems, strategic supply chains, market dynamics and key market players). **Challenges faced by the Member State and obstacles** that hinder progress including main gaps, shortcomings in the area of digital transformation, particularly in relation to general objectives and digital targets and an analysis of the key factors behind them, including socio-economic, as well as legislative, regulatory and policy factors. **Strengths and assets to be leveraged**: existing and potential capabilities of the Member State and opportunities for their digital transformation particularly in terms of general objectives and digital targets.

- **National trajectories and target values** to contribute to achieving the EU's digital targets **set out in Article 4,** describing how the Member States plans to contribute to achieving the digital targets. This should include **clearly reasoned national target values**, that the Member States aims to achieve in 2030, and **national projected trajectories** for meeting each digital target. All national trajectories should include **estimated yearly data points** and be built on the basis of the **EU level KPIs** laid down in an implementing act, using the same definitions and data sources as those set out in the act.

- **Policies, measures and actions to achieve the digital targets** presenting relevant activities including strategies, investment programmes, regulatory reforms, projects or initiatives supported by EU programmes for each digital target, and including an **analysis of the measures** to be taken, the **budget allocated**, distinguishing between national and EU budget, public and private sources) **the expected impacts and timing of the measures**, with an invitation to **propose new measures** including multi-country projects (MCPs).

- **Policies, measures and actions to contribute to achieving the general objectives:** roadmaps should include a description of the key policies, measures and actions that help achieve the objectives set out in Article 3 of the Digital Decade Policy Programme Decision, taking into account the Declaration of Digital Rights and principles, complementary to the measures set for targets. This chapter should specifically cover strategies, investment programmes, regulatory and reform-oriented measures and include **a short description of each measure, including the timing and expected impact, as well as the allocated or planned budget and human resources**.

- **EU level cooperation:** roadmaps should provide an overview of existing and possible future MCPs and joint commitments that would help to achieve the general objectives and digital targets. Each Member State is invited to specify the facilitating factors at EU level. National roadmaps could include other elements with a focus on actions that could be supported by the EU or could be best carried out in cooperation with other Member States to facilitate their achievement of the targets and objectives.

- **Stakeholders' involvement** highlighting the crucial importance of consulting stakeholders when preparing the national roadmaps and reporting on it. Reporting on stakeholders' involvement should include a summary of the consultation activities, the contributions and how these contributions have been integrated into the roadmaps.

- **Overall impact and conclusion** presenting the expected overall impact of all policies, measures (including regulatory measures) and actions envisaged to help achieve the general objectives and the digital targets and more generally for a successful digital transformation by 2030. This should include a short overview or synthesis of the expected impact of the measures for all digital targets, general objectives and digital rights and principles, with an invitation to adopt a cross-cutting analysis focused on digital citizenship, leadership and sovereignty, and the green transition.

The guidance includes **a detailed template** that the Member States were invited to use when submitting their national roadmaps.

Finally, the Digital Decade Policy Programme Decision also includes **a commitment to regularly revise and adjust national roadmaps** following the State of the Digital Decade reports and included recommendations.

Namely, Article 8(3) of the Decision states that *'Within 5 months of the publication of the second Report on the Digital Decade and every second year thereafter, the Member States concerned shall submit to the Commission adjustments to their national roadmaps consisting of policies, measures and actions they intend to undertake, including, where relevant, proposals for multi-country projects, to foster progress in achieving the general objectives and the areas concerned by the digital targets. If a Member State considers that no action is required and that its national roadmap does not require updating, it shall provide its reasons to the Commission.'*.

## 2. METHODOLOGY

For the State of Digital Decade Report (SDDR) 2024, the analysis is based on the roadmap versions submitted by the end of January 2024, giving Member States an extended deadline compared to the deadline of 9 October 2023 set in the DDPP Decision. This analysis is based on a comprehensive reading of the content of all roadmaps, including the state of play, measures, consultations with stakeholders to prepare the roadmaps, and the participation of Member States in multi-country projects.

The analysis in Section 3 includes:

- the completeness of the roadmaps, as compared to the requirements in the legal basis;

- the level of ambition of the roadmaps to contribute to the targets and objectives, including the national targets and trajectories defined to reach EU targets;

- the measures taken to achieve these targets and the objectives. The measures reported by the Member States were tentatively grouped into categories to provide a better overview;

- the budgets allocated to both targets and objectives;

- the link with current EU policies for each target and objective.

In addition to the overall analysis, a more strategic and qualitative analysis is required for the roadmaps, namely:

- A horizontal analysis across the Member States (Section 4) to identify the scope of their measures, possible areas for complementary activities, and challenges that feed into the

preparation of recommendations. This horizontal view feeds into the communication and analysis of the Staff Working Document, which include EU-level recommendations.

- A Member State-specific analysis (Section 5), e.g. the extent to which the proposed measures meet the specific challenges and targets of the Member States. This analysis will feed into the country reports, including specific recommendations at national level.

The review of the various elements in the national roadmaps depends on how they are reported by the Member States. For example, comparisons and aggregations on measures and budgets depend heavily on the level of detail of the information provided. Some roadmaps, such as France, provide very detailed information on measures, for example, while others provide a snapshot[18].

Analysing the measures required some additional structuring of the data. Under 'connectivity', as requested in the guidelines, a subcategory '5G' was created, in line with the guidelines. For each KPI, and to better organise the data, the Commission proposed categories to regroup measures and enable a more detailed analysis.

Budgets are also presented in various ways (per year, per source or per measure), in some roadmaps, while in others the budget is presented as a single figure per target or even cardinal point[19]. Unless stated otherwise, the budgets presented include EU funds, national funds, regional funds (all three public funds) and private funds.

## 3. CROSS-COUNTRY FINDINGS

Between November 2023 and February 2024, all 27 Member States submitted their national roadmaps to the Commission. Of the 27 roadmaps, 15 were published by April 2024 and made available on the Commission's website[20] to ensure transparency and showcase the digital transformation in all these Member States. It is important to note the diverse status of national roadmaps at the time of this report drafting, some of them being reported as final while others were still to be endorsed by the Member State authorities.

This Section is divided in four parts. The first part looks at whether the information requested in the guidelines has been presented: (state of play, multi-country projects and joint commitments, stakeholder consultations and overall assessment and conclusions). The second part checks the existence of targets and trajectories for each KPI, the level of ambition of these figures and if the national expected targets are below or above the EU-level target. The third and fourth parts look at the measures and budgets presented for each KPI.

### 3.1. Constitutive qualitative elements of the roadmaps

Of the 27 national roadmaps, 25 include a **state of play** on the digital transformation of the country concerned. The same number of Member States clearly present their strengths and weaknesses related to digital transformation.

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[18] Unless showing specific budgets or actions, measures related to two KPIs or more were assigned to a single KPI.

[19] If no source is provided for the budget, it is divided in equal parts between EU and national funds. If the budget is provided at KPI level, it has been evenly distributed between all the measures related to that specific KPI. Budgets prepared in currencies other than EUR have been converted to EUR using March 2024 exchange rates.

[20] https://digital-strategy.ec.europa.eu/en/policies/national-strategic-roadmaps.

While most roadmaps mention **multi-country projects** and joint commitments, the level of detail varies greatly. In 24 roadmaps the Member State clearly describes their involvement and future plans in MCPs. Greece, Spain and Slovenia have described in detail the measures envisaged under the European Digital Infrastructure Consortium (EDIC).

Eleven Member States have reported in depth on the **consultation of stakeholders** in the preparation of their roadmap and have included stakeholder feedback in their report.

While almost all countries have included overall **impact and conclusions** in their roadmaps, greater effort can be made on presenting the expected results per measure, target and objective.

Some elements fall outside the specific sections. For example, some roadmaps have clear and explicit links to precedent or connected **recommendations**. The integration of recommendations from the State of the Digital Decade report adopted in September 2023 and Country specific recommendations of the European Semester has been very limited, notably because of timing. However, five roadmaps (Czechia, Germany, Greece, Latvia, Poland) have at least partly addressed these recommendations.

Finally, 12 Member States included the **regional dimension** which was proposed to MS, not as a requirement but as a voluntary section. Specific regions taken into account include Flanders in Belgium.

*Table 1. Constitutive qualitative elements of the roadmaps, per country and content*

| Member States | State of play including MS's strengths and challenges | MCP, joint commitments and facilitating factors | Stakeholder consultation process | Overall impact and conclusions | Inclusion of SDDR and/or CSR recommendations | Regional/ subnational dimension |
|---|---|---|---|---|---|---|
| AT | | | | | | |
| BE | | | | | | |
| BG | | | | | | |
| CY | | | | | | |
| CZ | | | | | | |
| DE | | | | | | |
| DK | | | | | | |
| EE | | | | | | |
| EL | | | | | | |
| ES | | | | | | |
| FI | | | | | | |
| FR | | | | | | |
| HR | | | | | | |
| HU | | | | | | |
| IE | | | | | | |
| IT | | | | | | |
| LT | | | | | | |
| LU | | | | | | |
| LV | | | | | | |
| MT | | | | | | |
| NL | | | | | | |
| PL | | | | | | |
| PT | | | | | | |
| RO | | | | | | |
| SE | | | | | | |
| SI | | | | | | |
| SK | | | | | | |

### 3.2. Trajectories, targets and level of ambition

### 3.2.1. Start point and presence of trajectories

Based on the Digital Decade policy programme and the implementing act on KPIs[21], roadmaps should theoretically include a trajectory for **16 KPIs**: basic digital skills, ICT specialists, Very High Capacity Networks (VHCN), Fibre to the Premises (FTTP, as support KPI for VHCN), 5G, semiconductors, quantum, edge nodes, Cloud, AI, Big Data, basic level of digital intensity for SMEs (DII-Digital Intensity Index), unicorns, digital public services for citizens, digital public services for businesses, and e-Health. For 27 roadmaps, **432** trajectories were expected.

62.5% of the expected trajectories have been provided with annual values. Only Poland has presented annual values for 16 trajectories. Most of the **roadmaps present incomplete trajectories for their targets, either only for some years, for some targets or no trajectories at all**. Others, for example Estonia, have not included trajectories at all or have given incomplete information, for example Bulgaria.

50% of trajectories provide the correct baseline as a starting point for 13 KPIs, excluding semiconductors, edge nodes and quantum. All but two roadmaps use incorrect baselines (not the updated data or data from another year) for at least one KPI.

*Table 2. Presence of trajectories in national roadmaps by KPI*

| KPI | Annual values on trajectories | Correct baseline (DESI 2023) |
|---|---|---|
| **Very High-Capacity Network (gigabit)** | 23/27 | 18/27 |
| **Fibre To the Premises (FTTP)** | 12/27 | 11/27 |
| **Overall 5G coverage** | 23/27 | 17/27 |
| **Edge nodes** | 8/27 | N/A |
| **Semiconductor** | 2/27 | N/A |
| **Quantum** | 6/27 | N/A |
| **SMEs with at least basic digital intensity** | 22/27 | 21/27 |
| **Take-up of cloud services by enterprises** | 21/27 | 17/27 |
| **Take-up of AI by enterprises** | 21/27 | 16/27 |
| **Take-up of big data by enterprises** | 21/27 | 16/27 |
| **Number of unicorns** | 12/27 | 4/27 |
| **At least basic digital skills** | 23/27 | 21/27 |
| **ICT specialists in employment** | 22/27 | 19/27 |
| **Digital public services for citizens** | 18/27 | 17/27 |
| **Digital public services for businesses** | 18/27 | 18/27 |
| **eHealth** | 17/27 | 15/27 |
| **TOTAL** | 269 | 210 |

### 3.2.2. Targets and level of ambition

A significant roadmap analysis relates to the level of ambition of the target chosen by Member States to contribute to reaching the EU commitment. The graph below shows the national

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targets for 20230 chosen by each Member State classified into three categories: above, in line with[22] or below the EU target. The chart does not include the targets on quantum and semiconductors as these targets have only been set at EU level.

*Figure 1. State of play of national targets presented in national roadmaps*

| | At least basic digital skills | ICT specialists | VHCN | FTTP | 5G | Edge nodes | Cloud | Data Analytics (former Big Data) | AI | Digital Intensity Index | Unicorns | Digital Public Services for citizens | Digital Public Services for businesses | e-Health |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AT | ▲ | ✖ | ● | ✖ | ● | ✖ | ✖ | ✖ | ✖ | ✖ | ✖ | ✖ | ✖ | ● |
| BE | ● | ● | ● | ▼ | ● | ✖ | ● | ● | ● | ● | ● | ● | ● | ● |
| BG | ▼ | ▼ | ● | ● | ● | ✖ | ▼ | ▼ | ▼ | ▼ | ✖ | ● | ● | ● |
| CY | ● | ▼ | ● | ● | ● | ✖ | ● | ● | ● | ▲ | ✖ | ● | ● | ● |
| CZ | ● | ▼ | ▼ | ✖ | ● | ✖ | ▼ | ▼ | ▼ | ▼ | ▼ | ● | ● | ● |
| DE | ● | ✖ | ● | ● | ● | ✖ | ✖ | ✖ | ✖ | ▲ | ● | ✖ | ✖ | ● |
| DK | ● | ▼ | ✖ | ✖ | ✖ | ✖ | ▲ | ● | ▲ | ▲ | ✖ | ● | ● | ● |
| EE | ▼ | ✖ | ✖ | ✖ | ✖ | ✖ | ✖ | ✖ | ✖ | ✖ | ✖ | ✖ | ✖ | ✖ |
| EL | ▼ | ▼ | ● | ● | ● | ▲ | ▼ | ▼ | ▼ | ▼ | ▲ | ● | ● | ● |
| ES | ▲ | ▼ | ● | ● | ● | ✖ | ● | ● | ● | ● | ● | ● | ● | ● |
| FI | ▲ | ● | ● | ✖ | ● | ✖ | ● | ● | ● | ● | ✖ | ● | ● | ● |
| FR | ● | ● | ● | ✖ | ● | ✖ | ▼ | ● | ● | ▲ | ● | ● | ● | ● |
| HR | ● | ▼ | ● | ● | ▼ | ✖ | ● | ▼ | ▼ | ● | ▲ | ● | ● | ● |
| HU | ▼ | ▼ | ▼ | ✖ | ● | ✖ | ● | ● | ● | ● | ▲ | ● | ● | ● |
| IE | ● | ▼ | ● | ✖ | ● | ✖ | ● | ● | ● | ● | ✖ | ● | ● | ▼ |
| IT | ▼ | ▼ | ● | ● | ● | ● | ● | ● | ▼ | ● | ▲ | ● | ● | ● |
| LT | ● | ▼ | ● | ✖ | ● | ✖ | ● | ● | ● | ● | ● | ● | ● | ● |
| LU | ● | ● | ● | ● | ● | ✖ | ● | ● | ● | ● | ✖ | ● | ● | ● |
| LV | ▼ | ● | ▼ | ✖ | ▼ | ✖ | ● | ● | ● | ● | ▲ | ● | ● | ● |
| MT | ▼ | ▼ | ● | ● | ● | ✖ | ▲ | ▼ | ▼ | ▼ | ✖ | ● | ● | ● |
| NL | ✖ | ▼ | ● | ● | ● | ▲ | ● | ▼ | ● | ▼ | ✖ | ✖ | ✖ | ✖ |
| PL | ● | ▼ | ● | ● | ● | ▼ | ● | ● | ▼ | ● | ✖ | ● | ● | ● |
| PT | ● | ▼ | ✖ | ✖ | ✖ | ✖ | ✖ | ✖ | ✖ | ● | ● | ✖ | ✖ | ✖ |
| RO | ▼ | ▼ | ● | ● | ▼ | ● | ▼ | ▼ | ▼ | ▲ | ✖ | ● | ● | ✖ |
| SE | ▲ | ▲ | ● | ● | ● | ✖ | ▲ | ▼ | ▲ | ▲ | ▼ | ▼ | ▼ | ▼ |
| SI | ● | ● | ● | ● | ● | ▲ | ● | ● | ● | ● | ▲ | ● | ● | ● |
| SK | ▼ | ▼ | ● | ✖ | ● | ✖ | ● | ● | ● | ● | ▲ | ● | ● | ● |

▲ Above EU target
● In line with the EU target
▼ Below the EU target
✖ Not provided
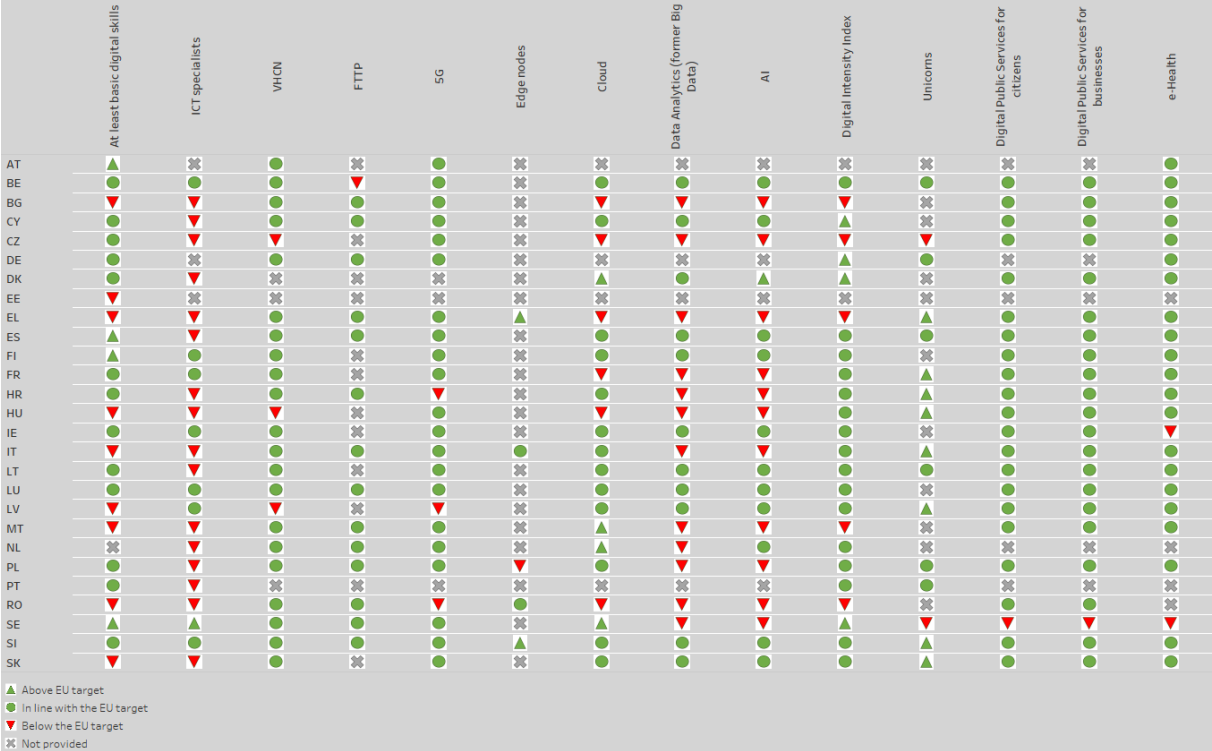
Member States presented a national target for 66% of the cases. In total, 54% of targets are **in line** with the EU-level targets (see **Error! Reference source not found.**). For a few indicators, such as basic digital skills, cloud and SME's Digital Intensity Index, some Member States have set their targets **above** the EU target[23].

Using the 2030 targets set by each Member State for each KPI, it is possible to compute the **aggregation** of the MS efforts and compare it to the EU 2030 target. To calculate this aggregation, the commitment (2030 target) of each MS needs to be **weighted** to take account of the size of the country within the EU. This weight depends on the KPI studied and is related to the unit of measurement (e.g. number of households for 5G coverage or population in the case of 'at least basic digital skills'). The definition and collection of these weights is the subject of a specific JRC technical paper[24]. This weighted method enables each country's **contribution** to the EU's overall aggregate to be determined. For example, the total number of households per MS is used to calculate the VHCN coverage percentage. When Spain commits to reaching 100% of VHCN coverage, it contributes to 9.9% of the overall EU target (as Spain represents 9.9% of EU's total number of households), while Austria, which has also pledged to reach 100%, will only contribute 2.2% of this total.

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[22] A national target is considered in line with the EU target if it is less than 5% below the EU one.

[23] This is possible only for 2030 targets below 100%: basic digital skills, ICT specialists, take-up of digital technologies, digital intensity of SMEs.

[24] JRC (2024) Torrecillas Jódar, J., Papazoglou, M., Signorelli, S. 'Methodology to aggregate Member States' Digital Decade targets at European Union level', López Cobo, M. editor(s), Publications Office of the European Union, Luxembourg, 2024, doi:10.2760/433497, JRC138292.

The aggregation of the 2030 targets of the Member States was calculated for three scenarios and compared to the 2030 EU target. Table 3 summarises the result of the analysis (% of the 2030 EU target achieved) of these three test scenarios:

1.      The '**current scenario**' describes what is actually reported in the national roadmaps. This means that 40 targets are missing (not indicated in the roadmaps) for the 12 KPIs considered in the analysis[25]. Those missing targets have a contribution of 0 to the aggregation. In this scenario, four aggregated KPIs reach above 90% of the EU target by 2030 (Basic Digital Skills, VHCN, 5G and Digital Intensity Index for SMEs) while five of them are far from it (below 70% of the expected 2030 EU target): ICT specialists, FTTP, Cloud, Data analytics and AI.

2.      The '**current scenario plus**' imputes the missing targets by rescaling the 2023 national value (assuming that it will evolve in line with the EU value) along the EU-level baseline trajectory (see Annex on 2024 EU trajectories). This scenario mimics a 'business as usual' growth of the KPIs for the missing data. In this 'current scenario plus', eight KPIs reach above 90% of EU target by 2030.

3.      The '**optimistic scenario**' is based on the assumption that the three countries with the highest leverage (see explanations below) will contribute to their maximum capacity, effectively reaching the EU target. The country's leverage is determined by calculating the disparity between its maximum potential contribution (i.e. as if the MS set target equal to the EU target) and its current contribution to the overall EU target (i.e. as in the 'current scenario plus'). Countries with the biggest gaps between these values are identified as having the highest leverage. Essentially, these countries offer the greatest potential for contributing significantly to the EU target.

*Table 3. Aggregation scenarios of MS targets compared to the EU 2030 target*

| KPI | Current scenario* (% EU 2030 target achieved) | Current scenario plus** | Optimistic scenario |
|---|---|---|---|
| Basic digital skills | 97.7% | 98.1% | 100% |
| ICT Specialists | 61.7% | 76.2% | 90.8% |
| VHCN | 95.6% | 99.4% | 99.9% |
| FTTP | 69.1% | 97.2% | 99.5% |
| 5G[26] | 94.5% | 98.4% | 100.0% |
| Cloud | 62.7% | 87.9% | 96.3% |
| Data Analytics | 47.8% | 69.7% | 83.4% |
| AI | 45% | 54.4% | 81.1% |
| Digital Intensity Index | 95.3% | 97.8% | 99.6% |
| Digital public services Citizens | 80.9% | 98.2% | 99.5% |
| Digital public services Business | 81% | 98.1% | 99.4% |

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[25] All KPIs indicated in **Error! Reference source not found.**, excluding edge nodes and unicorns as there are not enough targets for these KPIs in the roadmaps.

[26] The current KPI for the 5G target does not take into account quality of service. Since 2023, the European Commission together with the Member States is working on an update of the 5G indicator, which entails the development of a methodology to map quality of service (QoS).

| | | | | |
|---|---|---|---|---|
| e-Health | 83.6% | 96.5% | 98.8% |

When the aggregation of the MS contribution does not reach the 2030 EU-level target, it is possible to identify the countries whose potential effort (i.e. increasing their individual target to the expected 2030 EU target) would be the most beneficial. This is referred as the **leverage**. This leverage has been calculated as the difference between countries' maximum potential contribution (i.e. if the country set its target equal to the EU target) and their current contribution (under the projections of the 'current scenario plus'). Countries with the highest leverage are the ones contributing the most to the achievement of EU's overall targets. Only countries that have set their national target below the EU target can be considered as possible candidate to step up their effort. Table 4*Table 4. Countries with the highest leverage per KPI* shows the three countries with the highest leverage per KPI.

*Table 4. Countries with the highest leverage per KPI*

| Target | Country with the highest leverage to reach EU target | 2ⁿᵈ Country with the highest leverage to reach EU target | 3ʳᵈ Country with the highest leverage to reach EU target | Total potential increase in pp |
|---|---|---|---|---|
| **Basic digital skills** | Romania (+1.4pp) | Italy (+0.9pp) | Hungary (+0.5pp) | +3pp |
| **ICT Specialists** | Germany (+8.1pp) | Poland (+3.4pp) | Italy (+3.1pp) | +14.6pp |
| **VHCN** | Latvia (+0.2pp) | Czechia (+0.2pp) | Hungary (+0.1pp) | +0.5pp |
| **FTTP** | Czechia (+1.2pp) | Austria (+0.9pp) | Finland (+0.2pp) | +2.3pp |
| **5G** | Romania (+1.3 pp) | Latvia (+0.1pp) | Croatia (+0.1pp) | +1.5pp |
| **Cloud** | Germany (+3.6pp) | France (+3.4pp) | Bulgaria (+1.4pp) | +8.4pp |
| **Data Analytics** | Germany (+6pp) | France (+3.9pp) | Poland (+3.8 pp) | +13.7pp |
| **AI** | Germany (+16.1pp) | Poland (+6.2 pp) | France (+4.4 pp) | +26.8pp |
| **DII** | Austria (+0.7pp) | Bulgaria (+0.6pp) | Romania (+0.6pp) | +1.9pp |
| **Digital Public Services Citizens** | Germany (+0.5pp) | Sweden (+0.4pp) | Austria (+0.3pp) | +1.2pp |
| **Digital Public Services Business** | Germany (+0.5pp) | Portugal (+0.4pp) | Sweden (+0.3pp) | +1.2pp |
| **e-Health** | Romania (+0.8 pp) | Sweden (+0.8 pp) | Portugal (+0.8 pp) | +2.3pp |

For example, for cloud, France's weight in term of number of firms in the EU is 11.5%. Its current target as defined in its roadmap is 53.3% while the EU-level 2030 target is set at 75%. France's contribution to the EU aggregation is only 8.2% (53.3% * 11.5% / 75%). If France were to commit to reaching 75% of firms using cloud by 2030, it would contribute by 11.5%

to the overall EU target. Therefore, by increasing its effort to match the EU target, France's potential contribution can be increased by 3.3 percentage points (11.5% - 8.2%). If Romania and Bulgaria also increase their target to 75% of firms using cloud computing by 2030, then the EU average will jointly reach 98.5% of the target and the total increase will amount to 6.2 percentage points simply by combining the efforts of the three countries with the most leverage.

### 3.3. Measures to achieve targets and general objectives

The DDPP and the guidance request that the national roadmaps include a list of measures that each Member State intends to undertake to support progress for each **target and objective,** along with the budget and the expected impact of those measures.

Member States presented a total of **1623 measures in their roadmaps**. Of those, 1503 of these measures are linked to targets. The target with the highest quantity of proposed measures is Basic digital skills (292 measures, 18%), followed by Key public services (238 measures 16%) and ICT specialists (178 measures, 11%). **Edge nodes, Semiconductors and Quantum have the fewest measures[27]**.

*Table 5. Measures per target and country*

| DD Target | AT | BE | BG | CY | CZ | DE | DK | EE | EL | ES | FI | FR | HR | HU | IE | IT | LT | LU | LV | MT | NL | PL | PT | RO | SE | SI | SK | Total | % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Connectivity Gigabit | 1 | 8 | 3 | 6 | 4 | 4 | 2 | | 5 | 5 | 1 | 2 | 4 | 2 | 6 | 3 | 1 | 1 | 7 | 1 | 1 | 7 | | 3 | 8 | 5 | 3 | 93 | 6 |
| Connectivity 5G | 1 | 2 | 1 | | 3 | | | | 2 | 6 | | 2 | | 3 | 2 | 1 | | 2 | | | 1 | 2 | | 2 | 1 | 4 | | 35 | 2 |
| Semiconductors | 4 | 4 | | | 2 | 2 | 2 | | 4 | 5 | | 3 | 1 | | | 2 | 2 | | 3 | 2 | 4 | 3 | | 1 | | 3 | | 47 | 3 |
| Edge nodes | | 1 | | | | 1 | | | 4 | 3 | | 1 | | | 1 | 1 | | | 4 | | 1 | 1 | | | 1 | | | 19 | 1 |
| Quantum computing | 1 | 2 | 1 | 1 | 1 | 3 | 9 | | 7 | 1 | 2 | 1 | 2 | 1 | 5 | 4 | | | 2 | 7 | 2 | 2 | | 2 | 1 | 1 | | 58 | 3 |
| SME take-up | 2 | 16 | 8 | 1 | 4 | 5 | 7 | | 6 | 7 | | 1 | 4 | 1 | 2 | 4 | 1 | 5 | 5 | 4 | 4 | 8 | 5 | 15 | | 6 | 5 | 126 | 8 |
| Cloud-only uptake | | | | | | 1 | | | 1 | | | 1 | | 1 | | 1 | | | | | | 1 | | | | 1 | 1 | 8 | 0 |
| AI-only uptake | | | | 2 | 5 | | | | | | | 2 | | 2 | | | | | | | 2 | 3 | | | | 6 | 4 | 26 | 2 |
| Big- data uptake | | | | | | 1 | | | | | | | | 2 | | | | | | | | | | | | | 1 | 4 | 0 |
| Cloud/AI/Big Data uptake | 6 | 12 | 14 | 7 | 3 | | 7 | | 11 | 6 | 3 | | 2 | | 3 | 3 | 2 | 3 | 4 | 9 | 1 | | 1 | 8 | 6 | 4 | 11 | 126 | 7 |
| Unicorns | 17 | 8 | | 1 | 1 | | | | 4 | 11 | | | 2 | | 5 | | 3 | 3 | 3 | 9 | | | | 16 | 3 | 3 | 11 | 100 | 6 |
| Basic Digital Skills | 14 | 39 | 15 | 8 | 6 | 13 | 2 | 3 | 14 | 8 | 3 | 2 | 4 | 5 | 7 | 15 | 5 | 6 | 5 | 15 | 5 | 11 | 21 | 16 | 7 | 16 | 27 | 292 | 18 |
| ICT Specialists | 3 | 24 | 2 | 3 | 7 | 4 | 2 | | 9 | 6 | 3 | 2 | 5 | 3 | 9 | 12 | 8 | 9 | 4 | 10 | 4 | 6 | 6 | 7 | 4 | 5 | 21 | 178 | 11 |
| Digital Identity | | 7 | 1 | 3 | 2 | | 4 | | 5 | 1 | 1 | 4 | 1 | 7 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 5 | 6 | 2 | 1 | 1 | 1 | 60 | 4 |
| Key Public Services | 8 | 29 | 12 | 10 | 19 | 3 | 11 | | 13 | 6 | | 2 | 4 | 13 | 10 | 13 | 3 | 8 | 7 | 5 | 12 | 4 | 3 | 11 | 7 | 17 | 8 | 238 | 16 |
| e-Health | 3 | 9 | 3 | 8 | 4 | 4 | 6 | | 5 | 2 | | 2 | 1 | 2 | 6 | 1 | 2 | 6 | 6 | 2 | 5 | 2 | 4 | 3 | 1 | 4 | 2 | 93 | 5 |
| Total | 60 | 161 | 60 | 47 | 58 | 47 | 52 | 3 | 90 | 67 | 13 | 25 | 30 | 42 | 59 | 61 | 26 | 48 | 47 | 66 | 43 | 55 | 46 | 86 | 40 | 76 | 95 | 1503 | 100 |

### 3.3.1. Ambition set for achieving the Digital Decade general objectives

**A total of 425 measures from the roadmaps can also be linked to specific general objectives**. Of these, 120 were reported as contributing exclusively to the objectives, while the rest was reported as contributing to targets, but with a strong link to objectives. Despite a clear reference to objectives in the DDPP and in the guidance, references to general objectives in national roadmaps are far less developed than for targets.

*Figure 2 . Total number of measures per objective*

Measures by objective

● BE ● BG ● CY ● DE ● DK ● EL ● ES ● FR ● HR ● IE ● IT ● LT ● LU ● NL ● PL ● RO ● SE ● SI ● SK

| | |
|---|---|
| A. Building technological leaderhip | 122 |
| B. Competitiveness, resilience | 133 |
| C. Cybersecurity | 24 |
| D. Fundamental rights & democracy | 91 |
| E. Human-centred digital environment | 14 |
| F. Greening digital | 18 |
| G. Digital for green | 18 |
| H. Green-digital policy coherence | 5 |

0    20    40    60    80    100    120

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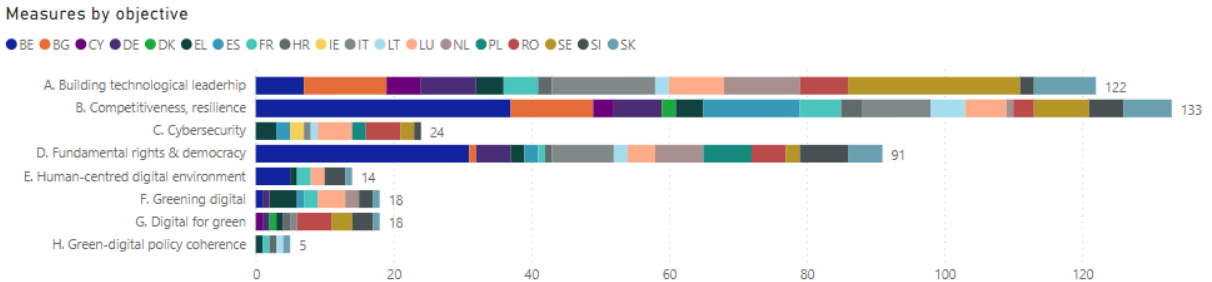
[27] 5G, Cloud, AI and Big Data are not included as they can also make part of other targets/measures.

## 3.4. Budgets

According to the national roadmaps submitted by the Member States, the total budget for the 1 623 measures for the targets and objectives stands at **EUR 251.2 billion**, as presented by the Member States in their roadmaps. This represents a global effort of **1.5 % of the EU's nominal GDP**.

Excluding private investment, the budget stands at **EUR 168.2 billion**.

*Table 6. Budget\* per target (EUR million), country and as % of national GDP*

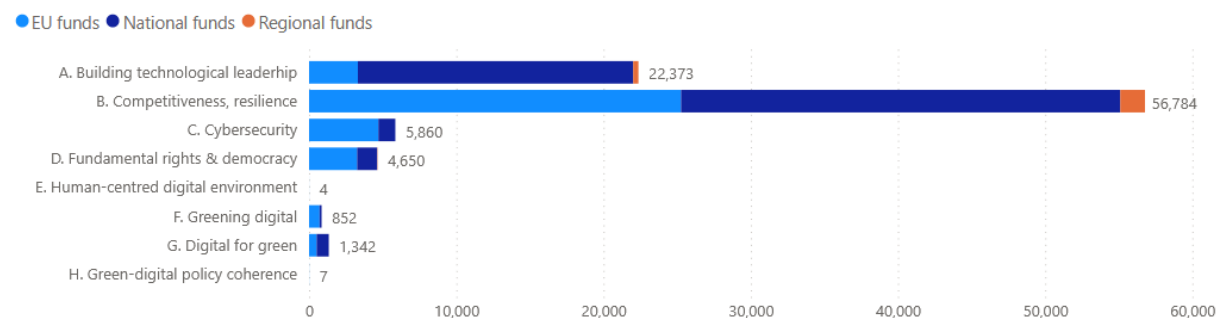| Targets | AT | BE | BG | CY | CZ | DE | DK | EE | EL | ES | FI | FR | HR | HU | IE | IT | LT | LU | LV | MT | NL | PL | PT | RO | SE | SI | SK | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Connectivity Gigabit | 1446 | 47 | 327 | 46 | 409 | 9459 | 4 | | 365 | 1112 | 32 | 13 | 361 | 119 | 2954 | 5424 | 101 | 9 | 49 | 0 | 0 | 2145 | | 0 | 864 | 123 | 125 | 25535 |
| Connectivity 5G | 0 | 80 | 5 | | 91 | | | | 0 | 1271 | | 128 | | 119 | 224 | 2020 | | 0 | | | 0 | 2 | | 0 | 0 | 4 | | 3943 |
| Semiconductors | 327 | 0 | | | 2 | 17000 | 6 | | 20 | 12150 | | 4660 | 0 | | 0 | 3292 | | | 152 | 0 | 718 | 1702 | | 0 | | 4 | | 40033 |
| Edge nodes | | 0 | | | | 700 | | | 2 | 204 | | 550 | | | 42 | 50 | | 8 | | | 70 | 3 | | | 3 | | | 1632 |
| Quantum computing | 107 | 13 | 3 | 7.5 | 11 | 1365 | 32 | | 49 | 22 | 149 | 1000 | 5 | 0 | | 50 | | | 13 | 8 | 675 | 21 | | 10 | 0 | 7 | | 3548 |
| SME take-up | 76 | 1 | 225 | 30 | 163 | 1988 | 14 | | 532 | 3916 | | 62 | 161 | 89 | 85 | 1533 | 149 | 11 | 251 | 8 | 247 | 5699 | 470 | 65 | | 52 | 87 | 15912 |
| Cloud-only uptake | | | | | | 120 | | | 145 | | | 150 | | 0 | | 900 | | | | | | 649 | | | 5 | 25 | | 1994 |
| AI-only uptake | | | | | 6 | 204 | | | | | | 25 | | 90 | | | | | 205 | 475 | | | | | 124 | 101 | | 1228 |
| Big data uptake | | | | | | 50 | | | | | | | | 90 | | | | | | | | | | | | 25 | | 165 |
| Cloud/AI/Big data uptake | 183 | 142 | 909 | 8 | 326 | | 31 | | 1744 | 726 | 275 | | 17 | | 27 | 136 | 23 | 8 | 148 | 80 | 214 | | | 60 | 60 | 957 | | 6394 |
| Unicorns | 1227 | 1 | | | 35 | 5000 | | | | 395 | 4836 | | | 30 | | 790 | | 133 | 200 | 483 | 70 | | | 445 | 0 | 136 | 304 | 14084 |
| Basic digital skills | 6 | 542 | 621 | 22 | 83 | 7666 | 1 | 0 | 512 | 1953 | 0 | 204 | 240 | 878 | 201 | 9223 | 159 | 19 | 104 | 82 | 348 | 495 | 0 | 808 | 84 | 179 | 448 | 24877 |
| ICT Specialists | 0 | 1 | 2 | 1 | 335 | 383 | 2 | | 131 | 259 | 41 | 2500 | 177 | 19 | 957 | 1173 | 396 | 2 | 71 | 16 | 0 | 23 | 0 | 253 | 855 | 4 | 357 | 7958 |
| Digital identity | | 0 | 38 | 11 | 13 | | 13 | | 119 | 17 | 0 | 16 | 1 | 160 | 0 | 260 | 17 | 1 | 0 | 0 | 0 | 9 | 24 | 220 | | 1 | 0 | 919 |
| Key public services | 28 | 45 | 61 | 101 | 271 | 394 | 9 | | 741 | 243 | | 0 | 12 | 161 | 193 | 7147 | 388 | 1 | 251 | 20 | 2225 | 151 | 0 | 1078 | 39 | 6 | 440 | 14005 |
| e-Health | 0 | 19 | | 22 | 23 | 0 | 2 | | 395 | 29 | | 848 | 115 | 0 | 174 | 1300 | 116 | 0 | 281 | 1 | 191 | 1000 | 300 | 559 | 0 | 133 | 1 | 5509 |
| Objectives | | | 0 | | | 0 | | | 0 | | | 129 | | | | | 44 | | | 0 | | | 69 | | 124 | 82 | | 448 |
| TOTAL | 3400 | 892 | 2192 | 247 | 1767 | 44328 | 114 | 0 | 5150 | 26739 | 497 | 10285 | 1118 | 1725 | 5647 | 32507 | 1481 | 302 | 1803 | 285 | 4892 | 12374 | 854 | 3567 | 2802 | 946 | 2270 | 168183 |
| % GDP | 0.7% | 0.2% | 2.3% | 0.8% | 0.6% | 1.1% | 0.0% | 0.0% | 2.3% | 1.8% | 0.2% | 0.4% | 1.5% | 0.9% | 1.1% | 1.6% | 2.1% | 0.4% | 4.5% | 1.5% | 0.5% | 1.6% | 0.3% | 1.1% | 0.5% | 1.5% | 1.8% | 1.0% |

**\*Budget excluding private investment**

Excluding private investment, the KPIs with the biggest budget are semiconductors (EUR 40 billion, 24%), Connectivity (EUR 25 billion, 15%) and Basic digital skills (EUR 25 billion, 15%). Public budgets (EU, national and regional funds together) can represent more than 4% of national GDPs.

The budget, broken down by objective in the figure below, covers the measures that were reported as directly contributing to specific KPIs with a strong link to objectives. Excluding private funds, the objectives with the biggest allocated budgets are competitiveness (EUR 56.8 billion), technological leadership (EUR 22.3 billion) and cybersecurity (EUR 5.9 billion).

*Figure 3. Total budget\* (EUR Million) by objective*



Budget (Mill. EUR) by objective and level

● EU funds ● National funds ● Regional funds

| | |
|---|---|
| A. Building technological leadership | 22,373 |
| B. Competitiveness, resilience | 56,784 |
| C. Cybersecurity | 5,860 |
| D. Fundamental rights & democracy | 4,650 |
| E. Human-centred digital environment | 4 |
| F. Greening digital | 852 |
| G. Digital for green | 1,342 |
| H. Green-digital policy coherence | 7 |

**\*Budget excluding private investment**

## 4. ANALYSIS BY OBJECTIVE AND TARGET

This Section is based on measures and budgets for each objective and KPI. It also includes information per category for each KPI and objective. An example of a relevant national measure is given for every objective and target, as well as the link between roadmap measures, policy challenges and recommendations.

## 4.1. A competitive, sovereign and resilient EU based on technological leadership

With the Digital Decade, the EU has decided to secure its position as a leader in transformative technology areas to ensure its competitiveness in the long term. This is essential not only for the EU to chart its own path in the digital transformation and promote sustainable technological development across the bloc, but also to enhance the EU's open strategic autonomy and resilience, strengthen its economy and industrial base. This objective must continue to coexist with the EU's commitment to a fair, open, values-based global digital market, and with the need to protect the sensitive data of individuals and companies.

### 4.1.1. Competitiveness and resilience

Strengthening competitiveness and resilience is an objective that many Member States covered explicitly in their roadmaps (133 measures representing EUR 73.8 billion). The biggest proportion of measures focuses on supporting digital ecosystems and scaling up innovative businesses. The deployment of technologies, networks and infrastructure is also considered in a considerable number of measures.

A small number of measures include regulatory action for:

1)      standards setting;

2)      interoperability and fair competition for users, businesses and regions (e.g. Bulgaria, Cyprus, Greece, Croatia, Luxembourg and Sweden);

3)      addressing dependencies for critical technologies supply (e.g. Denmark, Germany, France, Spain and the Netherlands);

4)      addressing initiatives related to international exchange (e.g. Lithuania and Sweden).

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**Relevant measure**

The government of **Netherlands** recently presented a National Technology Strategy, which **identifies the critical technologies** that should be developed (AI and data science, semiconductors, quantum, and cybersecurity technologies). It presents the country's current position and sets out concrete policy actions for the next decade. To address digital sovereignty, the country has taken the lead in analysing digital technology risks, identifying high-priority critical technologies, and committing to innovation and industrial policies. Initiatives like Quantum Delta NL and PhotonDelta will remain pivotal for the country's long-term competitive advantage.
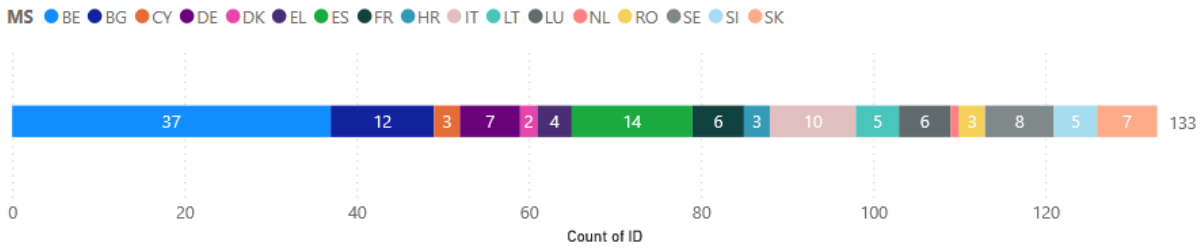
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*Figure 4. Measures and budget (EUR million) for competitiveness and resilience objectives ([28])*
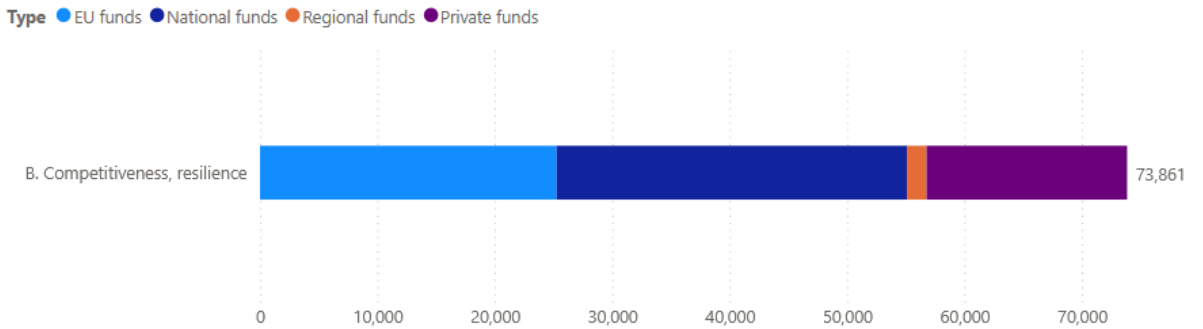
**Measures per Objective**

| Objective category | Measures | Public funds | Private funds |
|---|---|---|---|
| B.1. Support digital ecosystems and scaling up innovative businesses | 74 | 13,428 | 9,012 |
| B.2. Deployment of technologies/ networks/infrastructure | 36 | 9,513 | 30 |
| B.3. Regulatory action for standard setting/ interoperability and fair competition for users, businesses and regions | 10 | 375 | 0 |
| B.4. International dimension, EU Digital Diplomacy | 3 | 78 | 0 |
| B.5. Sovereignty: Addressing dependencies for critical technologies' supply | 10 | 33,389 | 8,035 |
| **Total** | **133** | **56,784** | **17,077** |

**Measures by MS**

MS ● BE ● BG ● CY ● DE ● DK ● EL ● ES ● FR ● HR ● IT ● LT ● LU ● NL ● RO ● SE ● SI ● SK

| 37 | 12 | 3 | 7 | 2 | 4 | 14 | 6 | 3 | 10 | 5 | 6 | 3 | 8 | 5 | 7 | 133 |

Count of ID

**Budget per Objective (EUR Mill.)**

Type ● EU funds ● National funds ● Regional funds ● Private funds

B. Competitiveness, resilience — 73,861

### 4.1.2. Building technological leadership

A number of Member States explicitly covered building technological leadership in their roadmaps (122 measures representing EUR 73.3 billion). The majority of measures focus on developing and deploying sovereign and resilient digital infrastructure and technologies, including via multi-country projects and other cross-country initiatives, for example in the area of high-performance computing, blockchain and security operation centres. The roadmaps also present measures that support research and development in technologies, networks and infrastructure, including via competence centres and innovation clusters.

> **Relevant measure**
>
> **Denmark** is investing in **boosting semiconductor production capacity in Europe.** The project, presented by the Technical University of Denmark (DTU), aims to double the capacity of its cleanroom (i.e. advanced laboratory facility) for microchip production at the National Centre for Nanofabrication and Characterisation (DTU Nanolab). The cleanroom will be designed to house researchers who develop and manufacture nano-chips, microchips,

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[28] Measures and budgets presented at objective level may also have been counted at target level.

quantum sensors, quantum encryption units and quantum computers, among other things. With a budget of EUR 45 million, the aim is to complete the project by mid-2026.
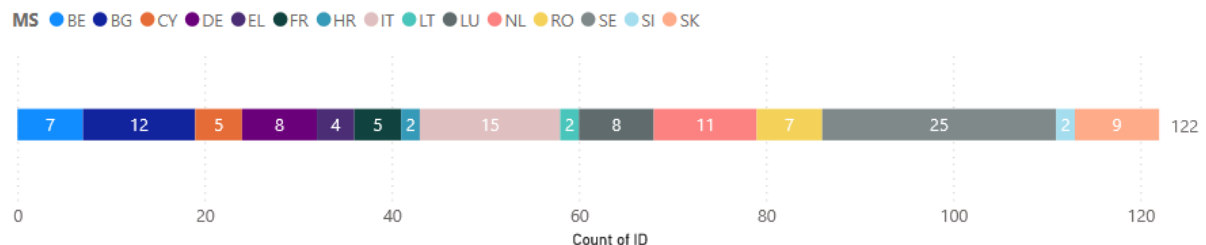
**Summary of findings**

Competitiveness, technological leadership, and resilience are major objectives of the DDPP. Most measures included in the roadmaps support these objectives but mostly indirectly, via measures for targets. The measures addressing these objectives explicitly in the roadmaps count for 16% of the total number of measures and 58% of the total budget proposed. More can be done by some Member States to develop coherent strategies to address these objectives, map gaps and address them, aligning also with the EU imperatives of increasing digital R&I across sectors, raising awareness of research related security risks, engaging in economic risk assessments, and deepening the single market.

*Figure 5. Measures and budget (EUR million) for objectives under technological leadership*

**Measures per Objective**

| Objective category | Measures | Public funds | Private funds |
|---|---|---|---|
| A.1. Support research and development in technologies/ networks/infrastructure | 42 | 4,015 | 676 |
| A.2. Developing and deploying sovereign and resilient digital infrastructure and technologies | 80 | 18,357 | 50,250 |
| **Total** | **122** | **22,373** | **50,926** |

**Measures by MS**

MS ● BE ● BG ● CY ● DE ● EL ● FR ● HR ● IT ● LT ● LU ● NL ● RO ● SE ● SI ● SK



**Budget per Objective (EUR Mill.)**

Type ● EU funds ● National funds ● Regional funds ● Private funds
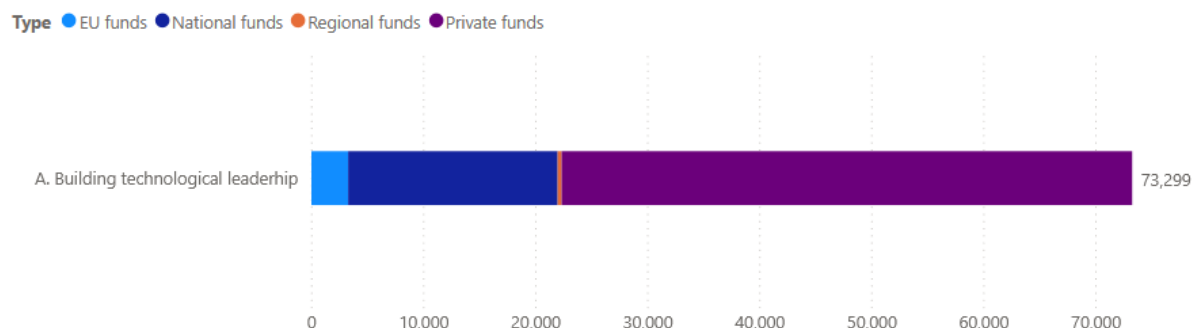


### 4.1.3. Strengthening cybersecurity

Some Member States (Italy, Romania) explicitly took cybersecurity into account in their roadmaps. Measures include cybersecurity-related strategies and action plans, awareness raising, cybersecurity skills training and protecting critical infrastructures. Ten Member States

linked 24 measures to the objectives of this cluster, mainly building technological leadership, competitiveness and resilience, and cybersecurity, with a budget of EUR 5.9 billion, most of which comes from EU funds.

**Relevant measure**

**Romania** is raising **awareness on cybersecurity skills through campaigns and support measures**. The first edition of the Cybersecurity Olympics has led to a 'Bootcamp' to prepare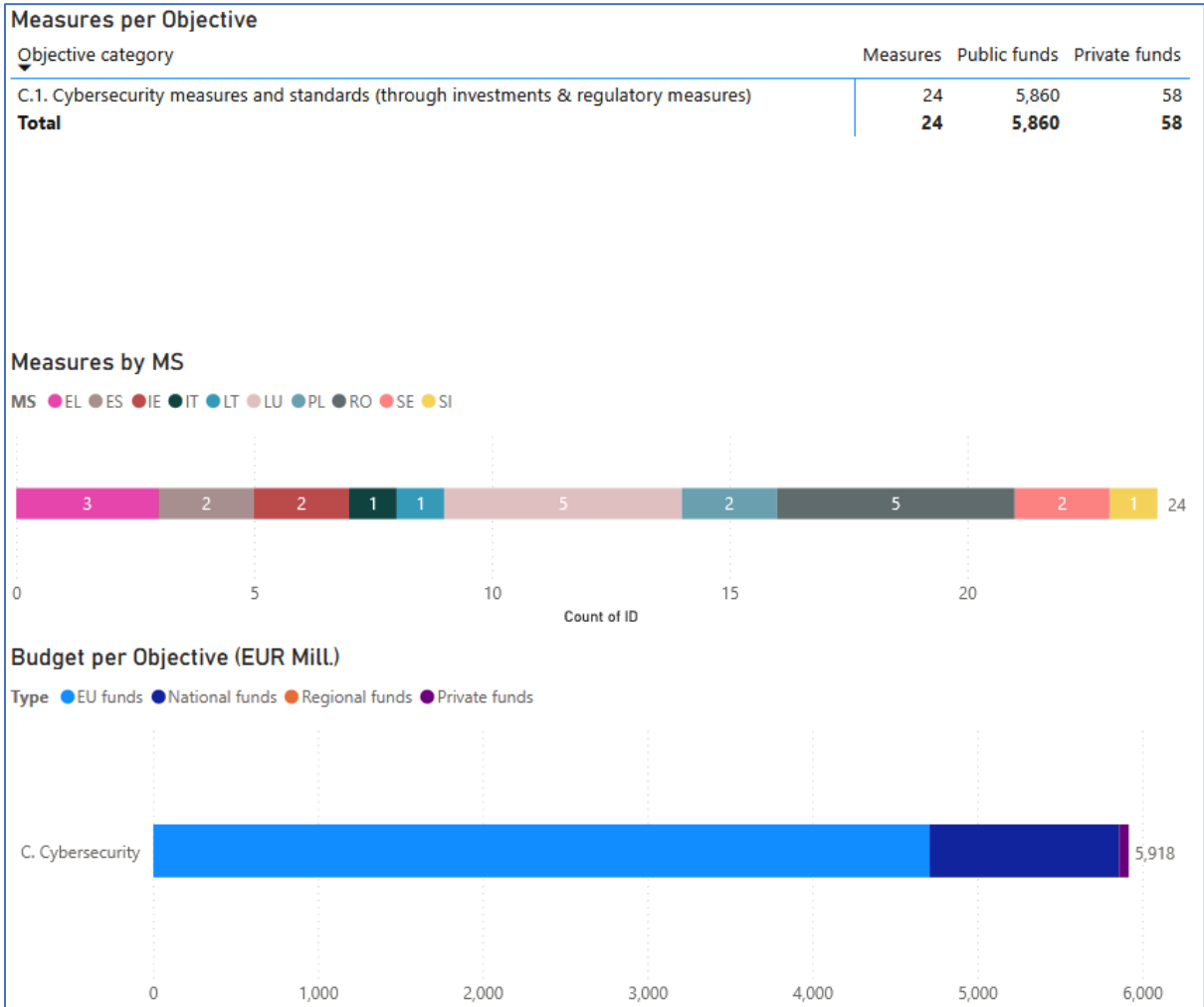 the national team for the European Cybersecurity Challenge. This initiative goes hand in hand with targeted measures envisaged by various EDIHs, as well as several new university programmes on cyber skills. There will also be an annual conference on cyber security and a Cyber Citizen Initiative involving workshops and public debates.

**Summary of findings**

The objectives of the DDPP include improving resilience to cyberattacks, helping increase awareness about risks and knowledge of cybersecurity processes, and increasing the efforts of public and private organisations to achieve at least basic levels of cybersecurity. The measures proposed by the Member States account for 1.4% of all measures and 2.3% of the total budget presented in their roadmaps. Not all Member States have reflected coherent cybersecurity strategies in their roadmaps, though some efforts in specific areas such as cybersecurity skills are already present. While Member States mention their will to align with EU level action, not many references appear in roadmaps, in particular to implement the EU 5G security Toolbox, to effectively mitigate risks, notably posed by high-risk suppliers, to transpose the NIS2 Directive and to implement the provisions on the newly agreed Cyber Resilience Act.

*Figure 6. Measures and budget (EUR million) for cybersecurity objectives*

**Measures per Objective**

| Objective category | Measures | Public funds | Private funds |
|---|---|---|---|
| C.1. Cybersecurity measures and standards (through investments & regulatory measures) | 24 | 5,860 | 58 |
| **Total** | **24** | **5,860** | **58** |

**Measures by MS**

MS ● EL ● ES ● IE ● IT ● LT ● LU ● PL ● RO ● SE ● SI

| 3 | 2 | 2 | 1 | 1 | 5 | 2 | 5 | 2 | 1 | 24 |

Count of ID

**Budget per Objective (EUR Mill.)**

Type ● EU funds ● National funds ● Regional funds ● Private funds

| C. Cybersecurity | 5,918 |

### 4.1.4. Gigabit connectivity

The roadmaps focus on measures to facilitate network rollout and on funding for white areas and strategic backbone networks.

In all, 24 Member States provided a **trajectory for the Gigabit connectivity target**. The majority of the national target values set for 2030 are in line with the EU target, according to which all end-users at a fixed location are covered by a Gigabit network up to the network termination point. Four Member States set a target value below that of the EU target.

Moreover, 10 Member States provided a trajectory for the roll-out of Fibre-to-the-Premises (FFTP) coverage, which is also monitored separately and taken into consideration when interpreting the data measuring the Gigabit connectivity target.

Member States reported a **total 93 measures contributing to this target**, with a **total budget of almost 82 billion EUR**. Around 70% of this budget comes from private industry investment, around 20% from national sources and around 10% from EU sources. The roadmaps include several new initiatives: around 20% of the measures are reported as new.

Around **50%** of the measures focus on **regulatory intervention** to facilitate **network deployment**, including the regulation of access and the reuse of physical infrastructures. Around **30%** of the measures provide **financial support for 'white', i.e. commercially non-**

**viable, areas** (including rural areas and outermost regions). Around **15%** of the measures provide **financial support for backbone** and other **strategic parts of the network**. The remaining **5%** promote **take up and other demand-pull initiatives** (mainly Belgium, Cyprus, Croatia, Ireland, Poland, Estonia and Sweden), **spectrum management** (mainly Austria, Belgium, Bulgaria and Finland) and **co-deployment,** and new business models **for service deployment** and **pro-investment regulation (**mainly Denmark, Greece, France and Slovenia).
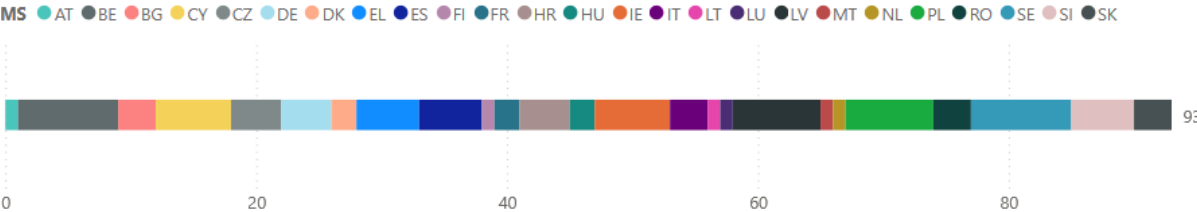
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**Relevant measure**

**Estonia** has made progress on middle-mile and last-mile efforts by launching the **Access Network Support Scheme 4.0 for 2023-2024**. By allowing communities to apply for this pilot measure, Estonia is attempting to reach households that proactively strive to connect to a public electronic communication access network. The project's budget is EUR 800 000, and the maximum amount of state aid is EUR 20 000 per project and EUR 10 000 per address. The pilot programme has supported five communities in 2023 by providing 100 addresses with VHCN.

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*Figure 7. Measures and budget (EUR million) for connectivity*

### Measures and budget (EUR Mill)

| Target category | Measures | Public funds | Private funds |
|---|---|---|---|
| | 1 | 250 | 0 |
| 1. Regulatory intervention to facilitate of network deployment | 39 | 10,366 | 50,003 |
| 2. Spectrum management | 2 | 32 | 0 |
| 3. Co-deployment and new business models for service deployment, pro-investment regulation | 5 | 31 | 0 |
| 4. Financial support for white/commercially non-viable areas (incl. rural and outermost) | 27 | 12,722 | 510 |
| 5. Financial support for backbone, other strategic parts of networks | 12 | 2,081 | 5,850 |
| 6. Promotion of take up and other demand-pull initiatives | 7 | 52 | 0 |
| **Total** | **93** | **25,535** | **56,364** |

### Measures by Member State

MS ● AT ● BE ● BG ● CY ● CZ ● DE ● DK ● EL ● ES ● FI ● FR ● HR ● HU ● IE ● IT ● LT ● LU ● LV ● MT ● NL ● PL ● RO ● SE ● SI ● SK

### Budget per source (EUR Mill)

Type ● EU funds ● National funds ● Regional funds ● Private funds

Connectivity Gigabit — 81,898
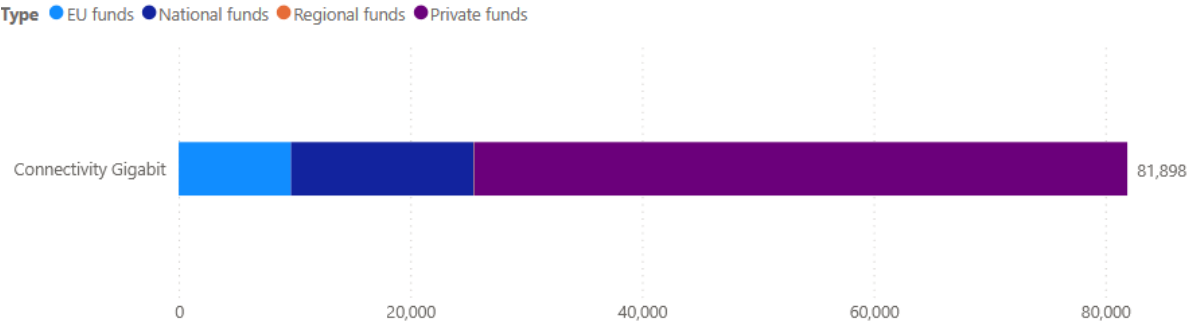
### 4.1.5. 5G – mobile connectivity

**A total of 24 Member States provided a trajectory for the 5G coverage target**. Most of the national target values set for 2030 are in line with the EU target, which is that all populated areas are covered by next-generation wireless high-speed networks with a performance at least equivalent to that of 5G, in accordance with the principle of technological neutrality. Six Member States set a target value below that of the EU.

**Member States reported a total of 35 measures contributing to this target, with a total budget of EUR 7.2 billion**. Around 65% of this budget comes from private industry investment, around 25% from EU sources and around 10% from national sources. The roadmaps include some new initiatives: around a quarter of the measures are reported as new, with a budget share of around 30%.

Around **30%** of the measures focus on spectrum management, including spectrum awards. Around 20% of the measures focus on regulatory intervention to facilitate network deployment. Around 15% of the measures provide financial support for 'white', i.e., commercially non-viable, areas (including rural areas and outermost regions) and another 15% include financial support for backbone and other strategic parts of the network. The remaining 20% promote take up and other demand-pull initiatives (mainly France), as well as co-deployment and new business models for service deployment and pro-investment regulation (mainly Czechia, Greece and Luxembourg).
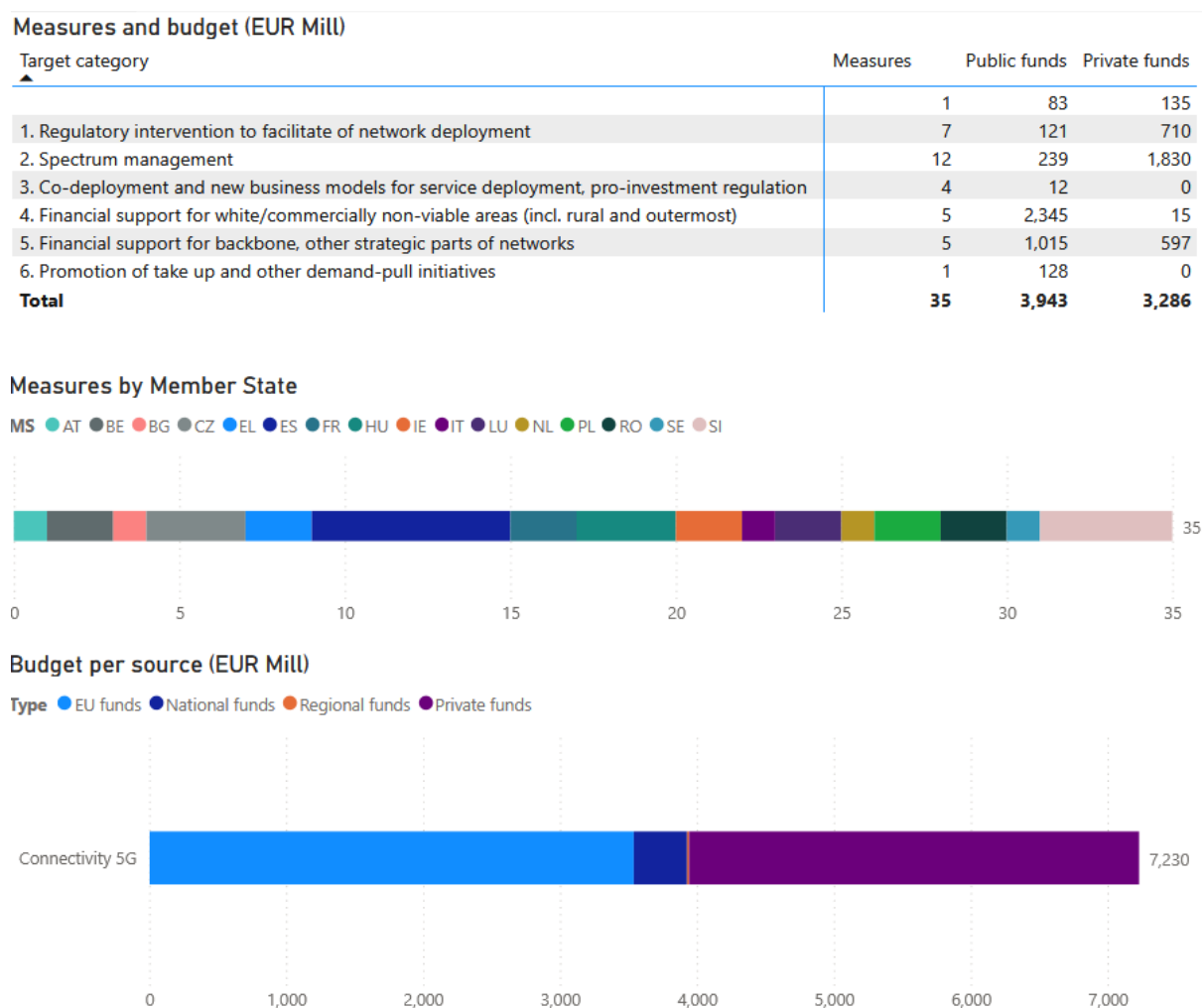
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**Relevant measure**

**Greece** is using fundings to **cover white areas with 5G**., The 5G-TERRA project, funded by the Connecting Europe Facility (CEF) Digital programme, started on 1 January 2024 with the objective of rolling out 5G infrastructure and services across the country to serve the public and promote social inclusion. The project will provide high-quality, leading-edge 5G connectivity to end-users in remote and sparsely populated areas in Greece, to enable efficient state-of-the-art services of general interest in the healthcare, education, and civil protection sectors.

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**Summary of findings**

The measures proposed by the Member States to support the 2030 Gigabit and 5G connectivity targets account for 8% of all measures and 17% of the total public budget presented in the roadmaps. At the current pace, Member States will need to step up their efforts to reach this target, especially as the recent developments mostly involve optical fibre networks (FTTP) and as coverage increases deployment will become increasingly costly. As there is no one-size-fits-all solution for accelerating the roll-out of broadband, most Member States need to sustain their efforts to align with the EU level of ambition using a mix of regulatory actions, stimulation of new business models, and financial support for commercially non-viable areas. In the specific case of 5G networks, Member States can facilitate the development of new 5G use cases and continue to ensure sufficient access of new players to spectrum for innovative applications. National measures can also be better aligned with certain EU-level actions, like stimulating investment in enhanced fixed and

mobile networks by also supporting data intensive applications and use cases, e.g. based on edge computing, AI, and IoT, and other B2B applications.

*Figure 8*. *Measures and budget (EUR million) for 5G*

### Measures and budget (EUR Mill)

| Target category | Measures | Public funds | Private funds |
|---|---|---|---|
| | 1 | 83 | 135 |
| 1. Regulatory intervention to facilitate of network deployment | 7 | 121 | 710 |
| 2. Spectrum management | 12 | 239 | 1,830 |
| 3. Co-deployment and new business models for service deployment, pro-investment regulation | 4 | 12 | 0 |
| 4. Financial support for white/commercially non-viable areas (incl. rural and outermost) | 5 | 2,345 | 15 |
| 5. Financial support for backbone, other strategic parts of networks | 5 | 1,015 | 597 |
| 6. Promotion of take up and other demand-pull initiatives | 1 | 128 | 0 |
| **Total** | **35** | **3,943** | **3,286** |

### Measures by Member State

MS ● AT ● BE ● BG ● CZ ● EL ● ES ● FR ● HU ● IE ● IT ● LU ● NL ● PL ● RO ● SE ● SI



### Budget per source (EUR Mill)

Type ● EU funds ● National funds ● Regional funds ● Private funds



## 4.1.6. Semiconductors

**Member States reported a total of 47 measures contributing to this target, with a total budget of EUR 48 billion** including private investment. This makes it the third biggest budget reported for a target. Around 30% of this budget comes from EU sources, around 55% from national sources, 15% from private industry investments and a very small amount from regional budgets. The roadmaps include several new initiatives: around half of the measures are reported as new - with a budget share of around 50%.

**Poland** provided a **trajectory for the semiconductor target,** namely the production, in accordance with EU law on environmental sustainability, of cutting-edge semiconductors in the EU corresponding to at least 20% of world production in value. **Slovenia** provided a trajectory for the **amount of semiconductor** R&D and the number of semiconductor manufacturing **enterprises.**

Around **40%** of the measures focus on **R&D for semiconductors,** including multi-country initiatives and projects such as the IPCEI on Microelectronics and Communication Technologies. Around **30%** focus on the **production capacity** and **industrial deployment of semiconductors**, including incentives to attract domestic and international investors to develop and expand manufacturing facilities. The remaining **30%** of the measures focus on 'from lab to market', i.e., support partnerships, knowledge and technology transfer, as well competence centres that facilitate collaboration and resource sharing, and **horizontal actions**, including research and development strategies.
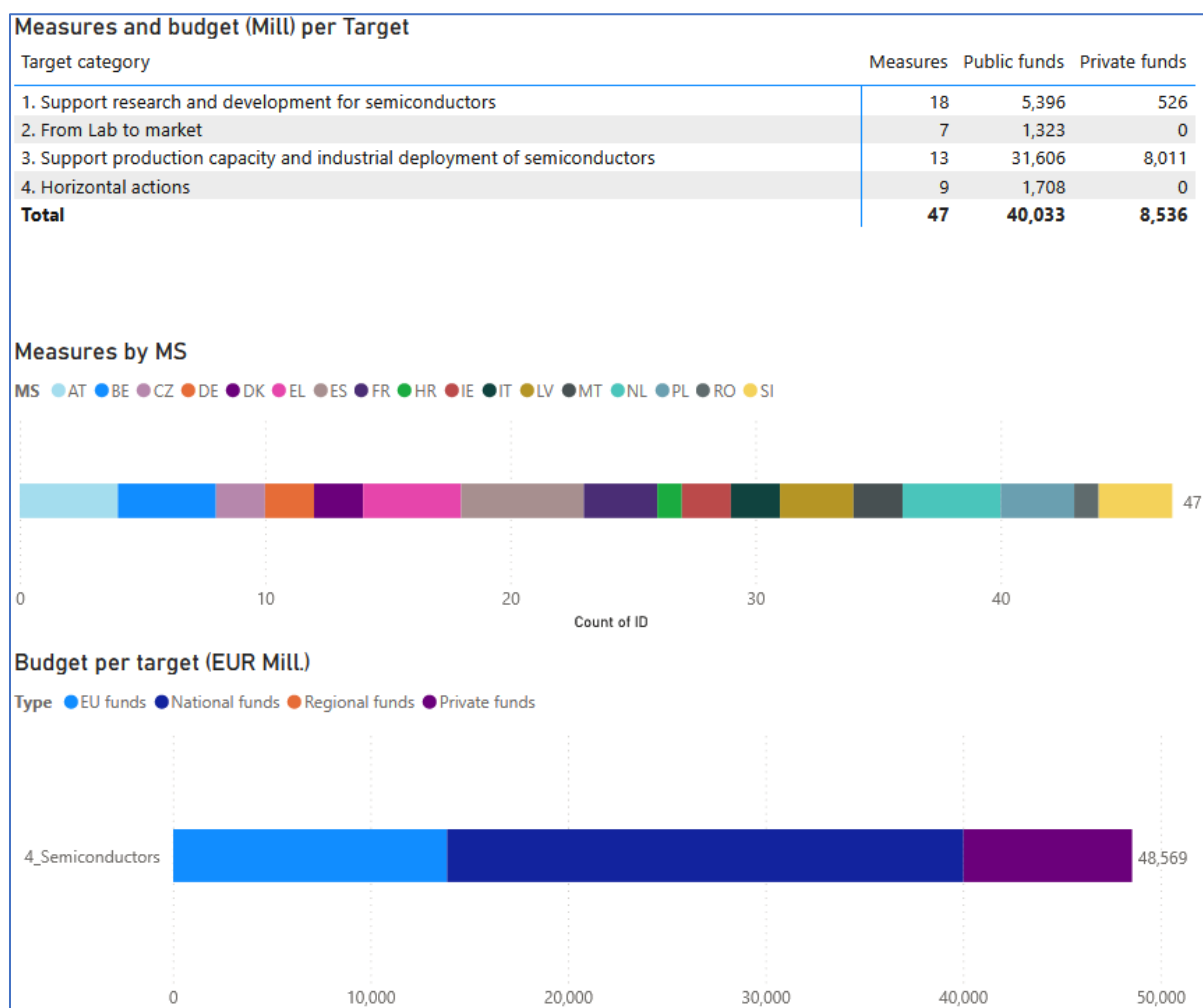
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**Relevant measure**

**Spain** intends to **contribute to semiconductor production** in the EU with the **PERTE Chip**, an initiative with an overall budget of EUR 12 billion that covers the whole value chain, including training, designing and production measures. A first mission PERTE Chip 2023 from the Centre for Innovation and Technological Development promotes R&D&I on cutting-edge microelectronic design, particularly the design of systems based on microprocessor cores of alternative architectures (such as RISC-V). The mission also includes communication interfaces, sensors and actuators or power elements. Furthermore, a call for 'the proof of concept' projects 2023 PERTE Chip was published in September 2023 -and awarded in May 2024 (EUR 21.22 million)-, to fund projects that accelerate the transfer of knowledge and results generated in research.

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**Summary of findings**

The measures proposed by the Member States to support the targets on semiconductors account for only 3% of all measures but more than 23% of the total public budget presented in the roadmaps. Considering the increasingly strategic nature of this target for competitiveness and resilience, the worrying trend of this KPI, and the fact that production activities are concentrated in only a few Member States, it is imperative that efforts are stepped up and reflected in the national roadmaps. Depending on their current state of play, context and strengths, Member States can continue to develop strategies and supportive framework conditions, with actions ranging from R&D for sustainable and secure chips for deployment, including through public tenders and standards, and manufacturing, while also strengthening their cross-country cooperation capabilities.

*Figure 9. Measures and budget (EUR million) for semiconductors*

**Measures and budget (Mill) per Target**

| Target category | Measures | Public funds | Private funds |
|---|---|---|---|
| 1. Support research and development for semiconductors | 18 | 5,396 | 526 |
| 2. From Lab to market | 7 | 1,323 | 0 |
| 3. Support production capacity and industrial deployment of semiconductors | 13 | 31,606 | 8,011 |
| 4. Horizontal actions | 9 | 1,708 | 0 |
| **Total** | **47** | **40,033** | **8,536** |

**Measures by MS**

MS ● AT ● BE ● CZ ● DE ● DK ● EL ● ES ● FR ● HR ● IE ● IT ● LV ● MT ● NL ● PL ● RO ● SI

**Budget per target (EUR Mill.)**

Type ● EU funds ● National funds ● Regional funds ● Private funds

### 4.1.7. Edge nodes

Five Member States (Greece, Italy, Luxembourg, Poland and Slovenia) provided a **trajectory for the edge nodes target**.

Only 11 Member States presented a **total of 19 measures contributing to this target**, with a **total budget of EUR 2 billion**. Around 45% of this budget comes from EU sources, around 35% from national sources and the remaining 20% from private industry investment. The roadmaps include several new initiatives: around one third of the measures are reported as new, with a budget share of around 55%.

Around **50%** of the measures focus on the **deployment of edge nodes,** including for research and/or first industrial deployment purposes, via the Important Project of Common European Interest (IPCEI) on Next-Generation Cloud Infrastructure and Services. Around **40%** focus on **R&D for edge nodes** and the remaining **10%** support **horizontal actions,** including the development of relevant strategies and legislative measures.
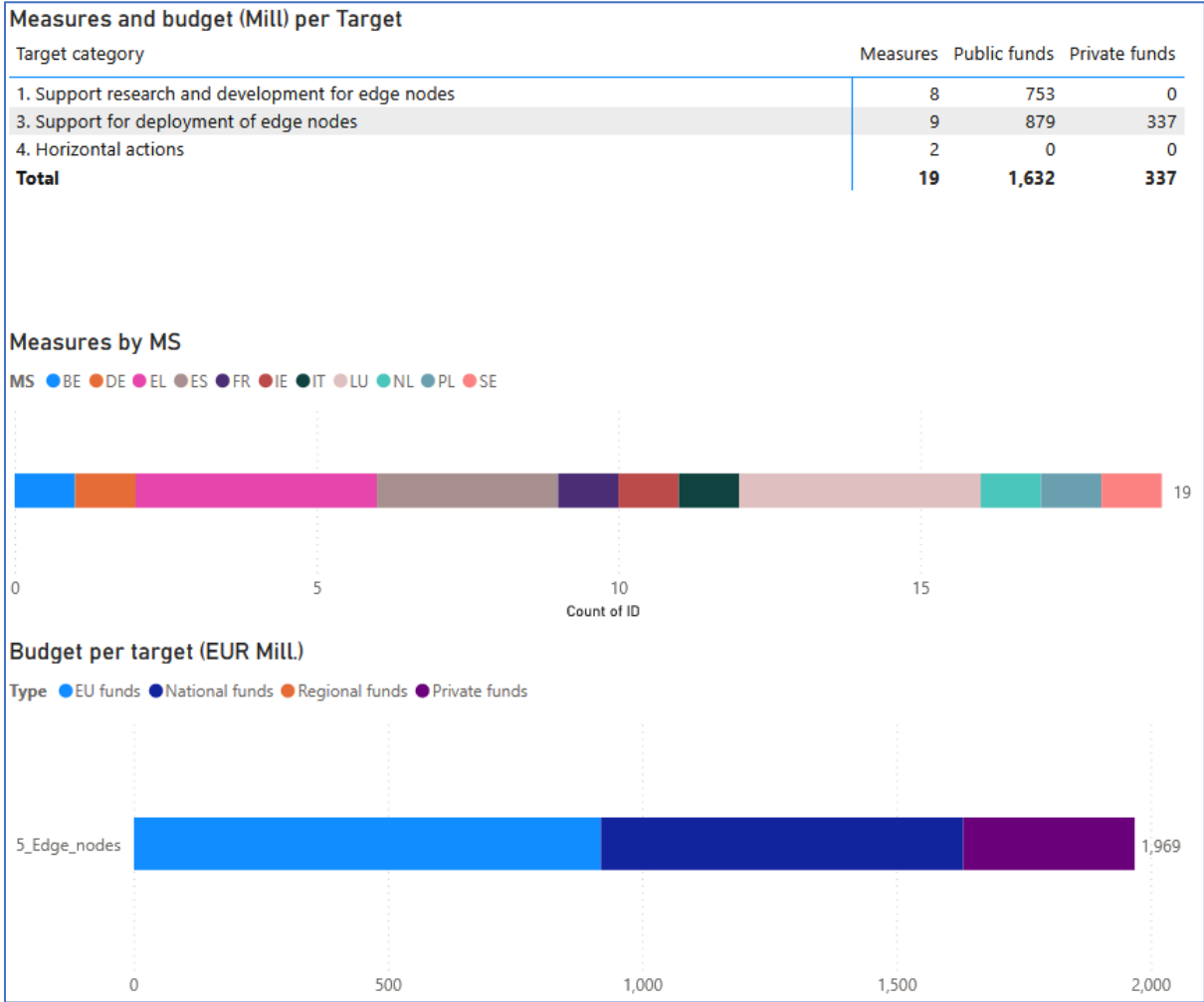
**Relevant measure**

**Germany** – together with France – coordinates the **IPCEI Next Generation Cloud Infrastructure and Services**, which is anticipated to be a catalyst for participating Member States. The measure focuses on R&D&I and will develop open-source software components for energy-efficient, safe, and sovereign edge nodes as part of several integrated national projects. These nodes are synchronised with cloud networks to form a cloud edge continuum. The EUR 80 million in EU funding has already been allocated and a further EUR 620 million is planned. This will be complemented by private sector investment of EUR 330 million.

**Summary of findings**

The measures proposed by Member States to support the target on edge nodes account for just 1% of all measures and less than 1% of the total public budget presented in the roadmaps. Considering the insufficient progress towards this target and the strategic importance of a cross European edge infrastructure for the increasingly distributed and low latency data processing, as well as its links with other advanced technologies such as AI and IoT, it is imperative that all Member States develop their policies in this field. Depending on their current state of play, activities can include support for R&D, development of suitable governance frameworks, support for acceleration and maturing of technologies and for their dissemination, and integration of edge nodes as part of their connectivity, IoT and AI strategies.

*Figure 10. Measures and budget (EUR million) for edge nodes*

**Measures and budget (Mill) per Target**

| Target category | Measures | Public funds | Private funds |
|---|---|---|---|
| 1. Support research and development for edge nodes | 8 | 753 | 0 |
| 3. Support for deployment of edge nodes | 9 | 879 | 337 |
| 4. Horizontal actions | 2 | 0 | 0 |
| **Total** | **19** | **1,632** | **337** |

**Measures by MS**

MS ●BE ●DE ●EL ●ES ●FR ●IE ●IT ●LU ●NL ●PL ●SE

19

Count of ID

**Budget per target (EUR Mill.)**

Type ●EU funds ●National funds ●Regional funds ●Private funds

5_Edge_nodes — 1,969

### 4.1.8. Quantum

**Six Member States** (Czechia, Germany, Finland, Croatia, Italy and Poland) provided each a **trajectory for the quantum target,** according to which the EU will have deployed its first computer with quantum acceleration by 2025, paving the way for the Union to be at the cutting edge of quantum capabilities by 2030.

Member States reported a **total of 58 measures contributing to this target**, with a **total budget of EUR 3.7 billion**. Around 80% of this budget comes from national sources, around 10% from regional budget, 5% from EU sources, and the remaining 5% from private industry investment. Half of the measures on quantum technology are national strategies/programmes and EU-level initiatives. The roadmaps reflect once-off support for R&D, support for the roll-out of quantum technology and the initial industrial deployments, production capacity and industrial deployment for semiconductors.

The roadmaps include several new initiatives: around one third of the measures are reported as new, making up around 10% of the budget.

Around **45%** of the measures focus for companies' **research in quantum computing and its deployment**, including via the European High Performance Joint Undertaking. Around **40%**

54

of the measures focus on **support for the deployment of quantum technologies.** The remaining **15%** of the measures support **cross-cutting actions,** including federated quantum infrastructure and collaboration initiatives supporting innovation. Only **a very small number** of measures from Latvia and Croatia focus on activities supporting 'from lab to market', i.e. **commercialisation of new solutions** and services on the market.

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**Relevant measure**

**Finland**'s roadmap presents a target of having **quantum computer with a minimum of 50 qubits in use in the country by 2025.** An additional EUR 70 million from national sources is guaranteed to upscale the quantum computer to 300-qubits at a later stage. To boost Finland's quantum potential, in January 2024 the Finnish Quantum Flagship project was awarded EUR 13 million by the Research Council of Finland.

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**Summary of findings**

The measures proposed by Member States to support the quantum target account for almost 4% of the total number of measures and just over 1% of the total public budget in the roadmaps. Given the strategic importance of quantum computing and quantum technologies, it is imperative that all Member States develop policies in this field. Depending on their current status and their respective strengths, activities can include: (i) support for R&D; (ii) development of suitable governance frameworks; (iii) partnerships among academia, public and private actors; (iv) support for accelerating, maturing and deploying of technologies; (v) the more general development of Member State capabilities in multi-country projects.
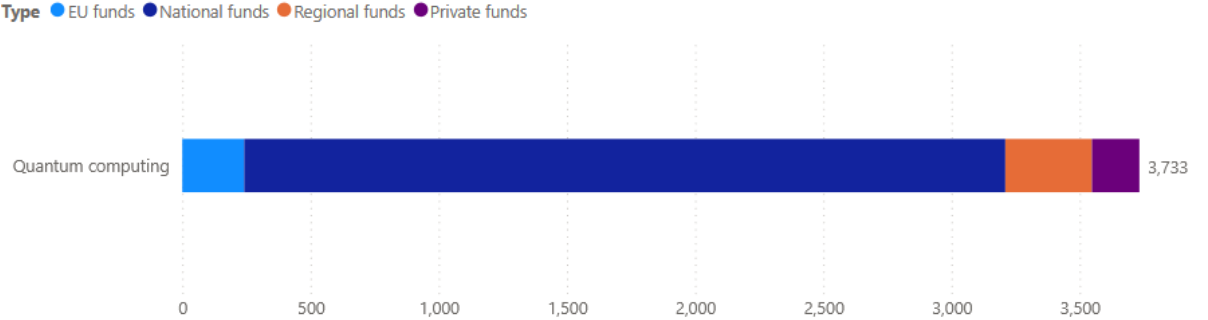
*Figure 11. Measures and budget (EUR million) for quantum*

**Measures and budget (EUR Mill)**

| Target category | Measures | Public funds | Private funds |
|---|---|---|---|
| | 1 | 3 | 0 |
| 1. Support research and development for quantum computing | 24 | 1,946 | 26 |
| 2. From Lab to market | 2 | 6 | 0 |
| 3. Support for deployment of quantum technologies | 23 | 1,509 | 159 |
| 4. Horizontal actions | 8 | 83 | 0 |
| **Total** | **58** | **3,548** | **185** |

**Measures by Member State**

MS ● AT ● BE ● BG ● CY ● CZ ● DE ● DK ● EL ● ES ● FI ● FR ● HR ● HU ● IE ● IT ● LV ● MT ● NL ● PL ● RO ● SE ● SI



**Budget per source (EUR Mill)**

Type ● EU funds ● National funds ● Regional funds ● Private funds
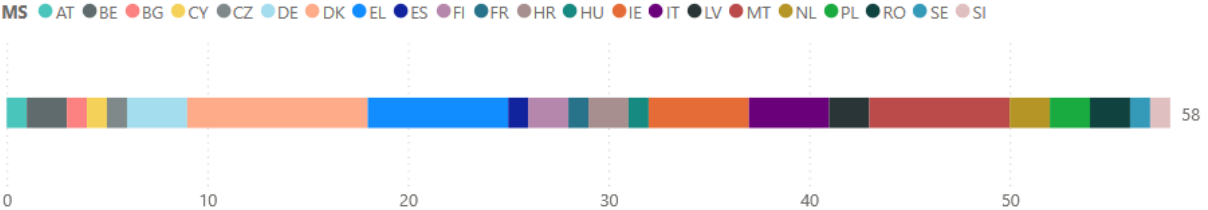


### 4.1.9. SMEs with at least basic digital intensity

A total of 25 Member States each provided a **trajectory for the target of SMEs with at least a basic level of digital intensity**. Most of the national targets for 2030 are in line with the EU target, which is more than 90% of SMEs reaching at least a basic level of digital intensity.

Member States reported a **total of 126 measures contributing to this target**, with a **total budget of EUR 16 billion**. Around 70% of this budget comes from EU sources, around 20% from national sources and the other 10% from regional sources. Around 1% of the budget is from private sources. The roadmaps include several new initiatives: around one third of the measures are reported as new, with a considerable budget share of around 70%.

Around **55%** of the measures focus on support for the **uptake and deployment of digital technologies** in companies, in particular SMEs. The measures include access to training to use digital technologies and financial support for example via funding programmes. Around **35%** of the measures focus on **strengthening the SME ecosystem, information sharing and knowledge exchange on digital technologies,** including via European Digital Innovation Hubs. The other **10%** of the measures support the **development of advanced technologies,** including via initiatives supporting innovation. Only **a very small number** of

measures focus on the **commercialisation of new solutions and services on the market (**e.g. Bulgaria, Portugal).

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**Relevant measure**

The **Swedish Agency for Economic and Regional Growth** (Tillväxtverket) granted support to 14 projects to raise awareness among **micro and small businesses about rural areas' needs and to better understand the digitalisation challenges they face**. The projects include building up knowledge on digital challenges and needs, and setting up pilot projects to apply digital models, tools and methods to strengthen companies' digital maturity. The support comes from the EU's rural development programme. The total amount granted is around EUR 1.7 million (SEK 20.3 million). This digital coaching and advice targets 1 300 micro companies and will help develop higher digital maturity in companies located in the Swedish countryside.

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**Summary of findings**

The measures proposed by Member States in their roadmaps to support the basic digital intensity of enterprises account for about 50% of the total number of measures but only 6% of the total public budget. Given that progress towards the digitalisation of SMEs target remains insufficient and quite uneven across the EU, and the untapped potential in terms of productivity, innovation, and competitiveness, it is crucial that Member States continue and, in some cases, intensify their actions in this area. Such action could involve activities of dissemination, bringing stakeholders together, training, testing facilities and access to finance. Activities of the European Digital Innovation Hubs are often very relevant and should be supported and further tailored to specific local needs.

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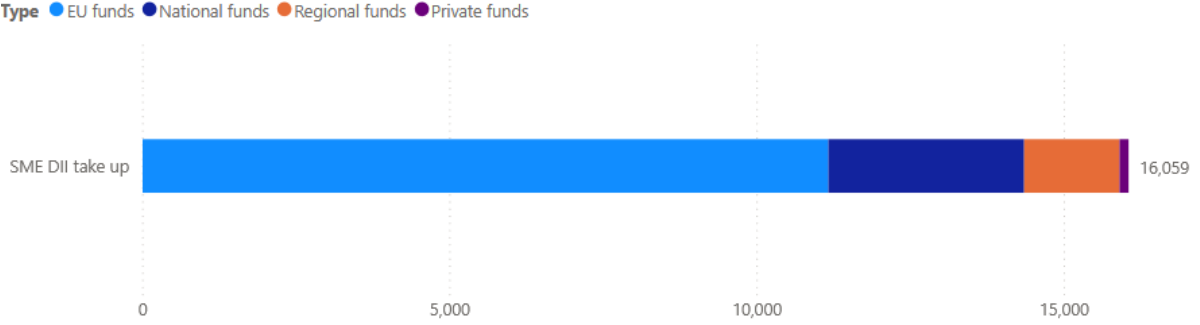*Figure 12. Measures and budget (EUR million) for SMEs' digital intensity*

**Measures and budget (EUR Mill)**

| Target category | Measures | Public funds | Private funds |
|---|---|---|---|
| | 1 | 1,222 | 0 |
| 1. Strengthen the ecosystem, information sharing and knowledge exchange on digital technologies | 42 | 1,775 | 146 |
| 2. Basic and intermediate digital skills of people currently in employment | 1 | 1 | 0 |
| 2. Support for uptake/ deployment | 64 | 12,518 | 0 |
| 3. Development: Support development of digital technologies | 15 | 241 | 1 |
| 4. Lab to Market | 2 | 151 | 0 |
| 5. Governance and other support initiatives not covered in points 1-4 | 1 | 5 | 0 |
| **Total** | **126** | **15,912** | **147** |

**Measures by Member State**

MS ●AT ●BE ●BG ●CY ●CZ ●DE ●DK ●EL ●ES ●FR ●HR ●HU ●IE ●IT ●LT ●LU ●LV ●MT ●NL ●PL ●PT ●RO ●SI ●SK



126

**Budget per source (EUR Mill)**

Type ●EU funds ●National funds ●Regional funds ●Private funds



SME DII take up — 16,059
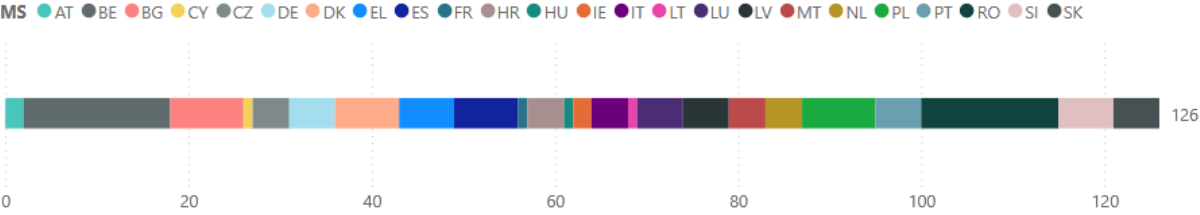
### 4.1.10. Cloud/big data/AI uptake

In the roadmaps received there is a clear focus on **ecosystem framework activities** and support for cloud, big data and AI **development**. A total of 23 Member States provided a trajectory for the take-up of cloud computing services, big data or artificial intelligence target. Most of the national targets set for 2030 are in line with the EU target, which is at least 75% of Union enterprises have taken up at least one of the following three technologies: cloud computing services, big data or AI. Considering cloud computing services individually, Malta, the Netherlands, Denmark and Sweden assumed a national target value above 75%.

Member States reported a total of 164 measures contributing to the uptake of cloud computing services, big data or AI with a total budget of EUR 10 billion. Around 65% of this budget comes from EU sources, around 30% from national budget and the other 5% comes from private industry investment and regional budgets. The roadmaps include a considerable number of new impulses: around 40% of the reported measures are new (accounting for 50% of the budget).

The measures focus on three areas: strengthening the **ecosystems, information sharing and knowledge exchange** on the update of cloud/big data/AI/ uptake; enabling **framework conditions for uptake**, including access to training and financial support for example via

58

funding programmes; and **supporting the development of cloud/big data/AI capabilities**, including via R&D for advanced technologies. There are significantly fewer measures on fostering the roll-out and creation of viable industrial solutions in the market is significantly less present. Belgium, Denmark, Greece, Romania, Sweden and Slovakia reported relevant measures in their roadmaps.

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**Relevant measure (1)**

The **Maltese** roadmap presents one dedicated measure **to foster the adoption of data analytics** by Maltese companies. The 'Technological assurance sandbox' (MDIA-TAS) is intended to guide solution owners throughout a residency of at most 4 years as they align their solution with established control objectives based on international standards, in a phased and gradual approach. This process can help ensure applicants' technology solutions meet set expectations related to data and their management. The measure is directly focused on helping business to have access to and use the reporting features of data analytics solutions, which is directly related to the data analytics KPI.

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**Relevant measure (2)**

In **Belgium**, the Flanders' Innovation & Entrepreneurship (VLAIO) agency has an annual budget of EUR 15 million for specific actions related to **increasing the uptake of AI in companies**. In the 'implementation part' of the Flemish AI action plan, companies are encouraged, through various support measures, to take action on data-driven digitalisation and AI. Actions aim to: (i) inspire, inform, and raise awareness among companies about the potential of the solutions; (ii) provide coaching or a guidance process; (iii) encourage participation in a collective process such as starting an R&D project.
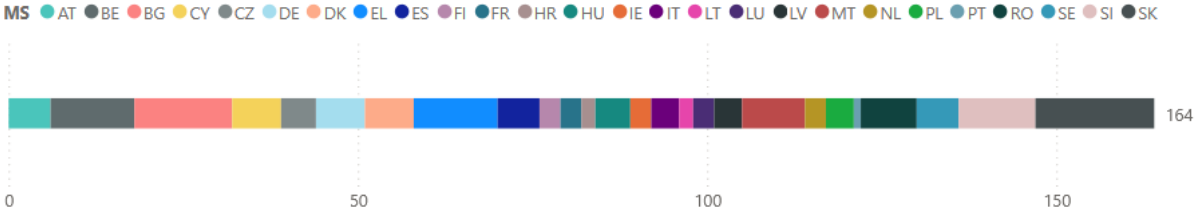
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**Summary of findings**

The measures proposed by Member States in their roadmaps to support the digitalisation of enterprises are also relevant to supporting the targets on the adoption of advanced technology. In addition, Member States propose specific measures to help reach the target on AI, cloud and big data; these account for about 10% of the total number of measures and 3% of the total public budget. Given the very slow progress on these KPIs, and the strategic importance and links between these targets, more targeted support measures could be added to the roadmaps. These measures should be in line with the EU-level recommendations to invest in developing and disseminating trustworthy and sovereign solutions, incentivising their use and making the necessary framework conditions available including legal and technical support.

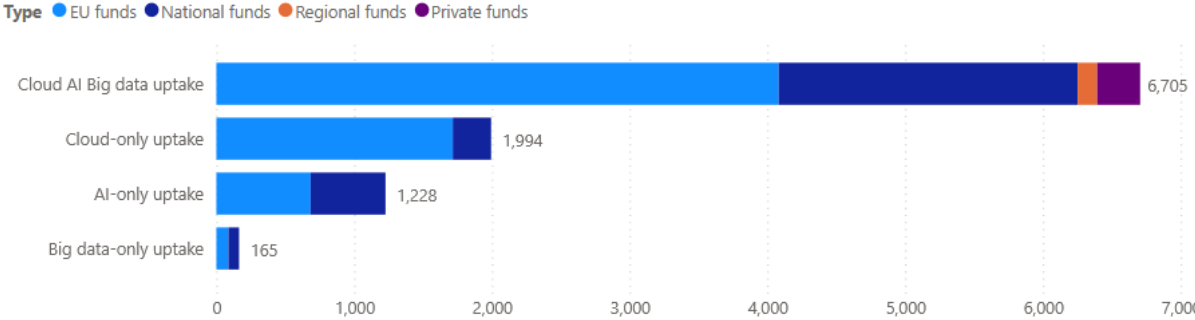*Figure 13. Measures and budget (EUR million) for cloud/big data/AI*

**Measures and budget (EUR Mill)**

| Target category | Measures | Public funds | Private funds |
|---|---|---|---|
| | 5 | 262 | 0 |
| 1. Strenghen the ecosystems, information sharing and knowledge exchange on cloud/AI/big data uptake | 53 | 2,710 | 2 |
| 2. Enable framework conditions for uptake | 48 | 1,848 | 44 |
| 3. Support development of AI/Cloud/Big data capabilities | 46 | 3,882 | 264 |
| 4. Foster roll-out and establishment of viable industrial solutions in the market (growth stage) | 12 | 1,079 | 1 |
| **Total** | **164** | **9,781** | **311** |

**Measures by Member State**

MS ● AT ● BE ● BG ● CY ● CZ ● DE ● DK ● EL ● ES ● FI ● FR ● HR ● HU ● IE ● IT ● LT ● LU ● LV ● MT ● NL ● PL ● PT ● RO ● SE ● SI ● SK

164

**Budget per source (EUR Mill)**

Type ● EU funds ● National funds ● Regional funds ● Private funds

| | |
|---|---|
| Cloud AI Big data uptake | 6,705 |
| Cloud-only uptake | 1,994 |
| AI-only uptake | 1,228 |
| Big data-only uptake | 165 |

### 4.1.11. Unicorns

A total of 16 Member States each provide a trajectory for the target on unicorn companies and innovative scale-ups. Achieving this target aims to stimulate the growth of innovative scale-ups and improve their access to finance, leading to at least a doubling of the number of unicorns.

Member States reported a total of **100 measures** contributing to the target on unicorns and innovative scale-ups target with a total budget of **EUR 26 billion,** which is the highest budget for a KPI. Around 25% of this budget comes from EU sources, around 25% from national budget and 50% from private industry investment. The roadmaps include a considerable number of new initiatives: around 20% of the measures are new, with a budget share of around 75%.

At around **40%,** most of the measures focus on **access to finance**, including new funding opportunities adapted to the different unicorns/scale-up life cycles. Around **30%** of the measures foster **technology transfer, incubation**, spin offs, spin outs and **start-up ecosystems**. The other **30%** of the measures support **framework conditions** and **regulation** for start-ups, including dedicated strategies and creating a framework to promote innovation activities.
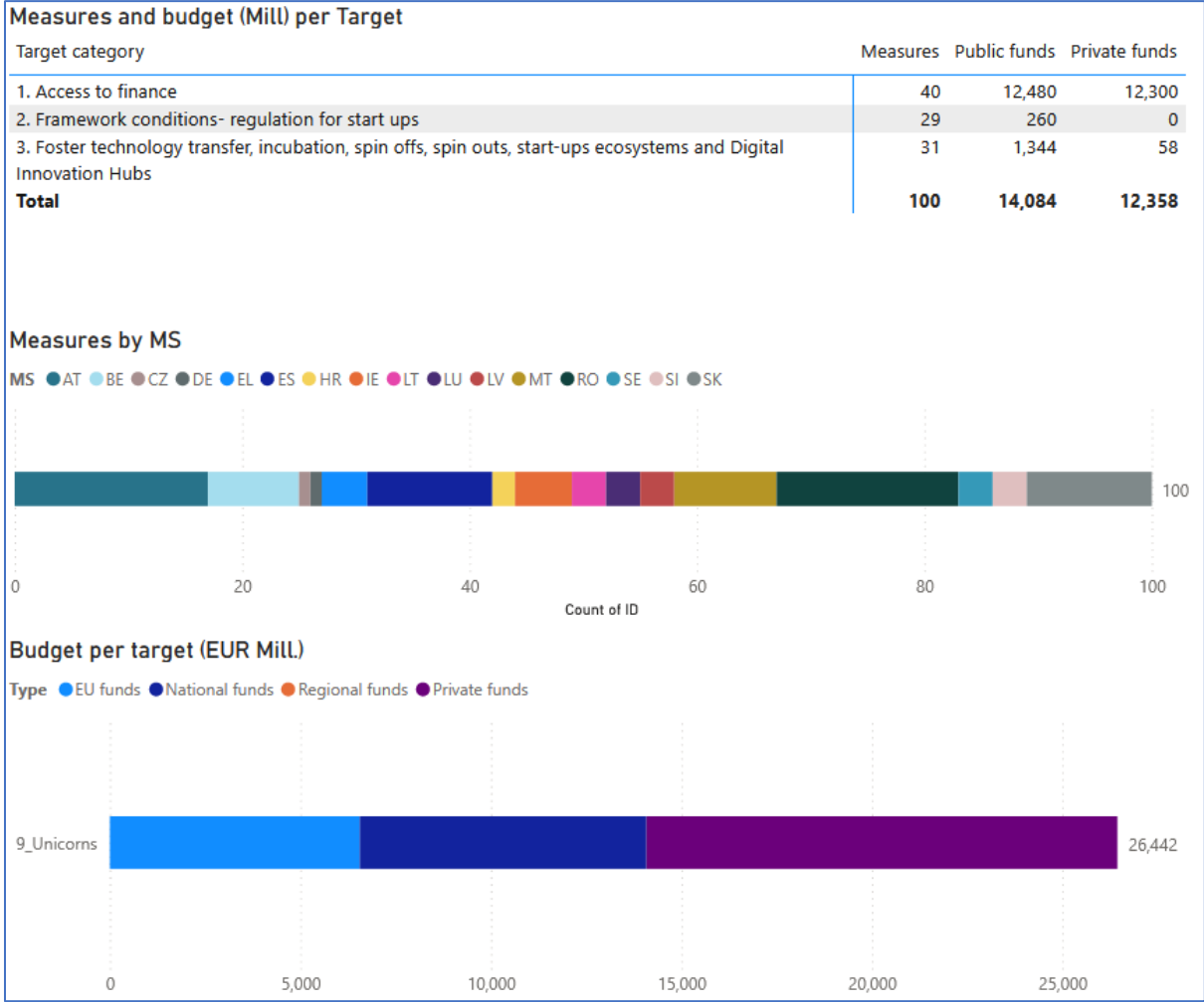
**Relevant measure**

In 2023, the **Swedish** government gave Vinnova, Sweden's innovation agency, the task of **strengthening the innovation and research programme 'Advanced Digitalisation'**. The initiatives under the programme aim to develop and apply new digital technology, strengthen Swedish competitiveness, and enable a sustainable transition. Advanced Digitalisation is a joint partnership between and co-financed by private and public bodies. The public support budget is EUR 210 million and runs from 2023 to 2027. The programme's total budget, with the contribution of participating companies, is EUR 420 million. So far, 400 organisations have participated in 180 projects. Advanced Digitalisation offers activities in the fields of enabling technologies, electrification, digital infrastructure and communication, learning and skills.

**Summary of findings**

The measures proposed by Member States in their roadmaps to support the unicorn target account for almost 7% of the total number of measures and 5% of the total public investment. Given the importance of scaling up innovative businesses for competitiveness, technological leadership and sovereignty, against the backdrop of worsening external financing conditions, it is essential that Member States strengthen their support for these businesses. In line with the EU-level recommendations, Member States can provide this support in different ways, including tech transfers and spinoffs from universities and research centres, using public procurement to support innovative start-ups, stimulating private investments and continuously improving conditions to do business.

*Figure 14. Measures and budget (EUR million) for unicorns*

**Measures and budget (Mill) per Target**

| Target category | Measures | Public funds | Private funds |
|---|---|---|---|
| 1. Access to finance | 40 | 12,480 | 12,300 |
| 2. Framework conditions- regulation for start ups | 29 | 260 | 0 |
| 3. Foster technology transfer, incubation, spin offs, spin outs, start-ups ecosystems and Digital Innovation Hubs | 31 | 1,344 | 58 |
| **Total** | **100** | **14,084** | **12,358** |

**Measures by MS**

MS ●AT ●BE ●CZ ●DE ●EL ●ES ●HR ●IE ●LT ●LU ●LV ●MT ●RO ●SE ●SI ●SK



*Count of ID*

**Budget per target (EUR Mill.)**

Type ●EU funds ●National funds ●Regional funds ●Private funds



## 4.2. Protecting and empowering EU people and society

The Digital Decade Policy Programme clearly calls for bridging the digital divide and promotes 'human-centred, fundamental-rights based, inclusive, transparent and open digital environments'. This is a challenging ambition and is also at the core of the European Declaration on Digital Rights and Principles. The aim is to promote a digital transformation that puts people at the centre, empower them and contributes to a fair and inclusive society and economy in the EU.

The trajectories proposed aim to empower people, promote democratic values and enhance trust, transparency and freedom of speech.

### 4.2.1. Protect fundamental rights, empower democratic values online and promote human centric and responsible AI systems

Protecting fundamental rights and empowering democratic values online is considered by a small number of Member States in their roadmaps (Belgium, Croatia, Greece, Luxembourg, the Netherlands, Romania, Slovenia). The 91 measures, accounting for EUR 4.6 billion, include activities aiming to protect people from disinformation, manipulation and harmful content.

In particular, promoting human centric and responsible AI systems is considered by a small number of Member States in their roadmaps (e.g. Belgium, Germany, Greece, the Netherlands, Sweden). The measures support the development of safe and non-discriminatory AI systems, including in social services, education and R&D projects in SMEs.

**Summary of findings**

National roadmaps include measures that address the protection of users and fundamental rights online but often only indirectly and as part of broader measures, lacking a specific focus. Issues like disinformation, exposure to harmful or illegal content or misuse of personal data are significant challenges on the rise in the EU, increasingly debated and a reason for concern among the public. Over the last 5 years, the EU has paid close attention to these issues and put in place a set of regulatory and non-regulatory measures, such as the Digital Services Act and the AI Act. It is crucial that Member States take all the necessary measures to ensure an effective implementation of the existing regulatory framework, in strict collaboration with the Commission and designated governance bodies.
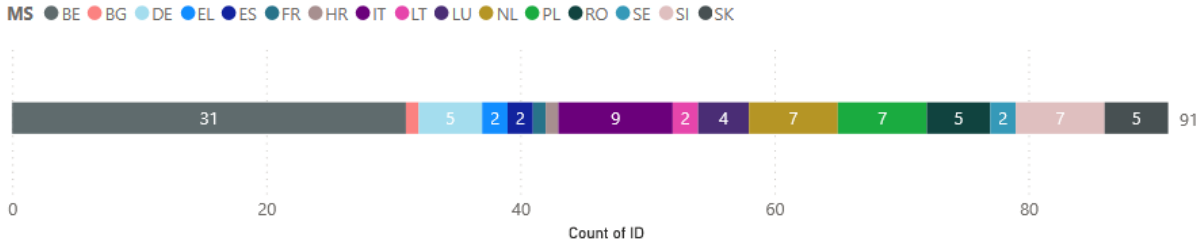
In addition, Member States might consider setting in place/reporting on complementary actions to: (i) strengthen research and gain a better understanding of the current issues (such as the complex links between mental health and online tools, drivers behind disinformation); (ii) reinforce fact-checking capabilities; (iii) enhance media literacy and risk awareness; (iv) set up and improve parental control tools; (v) monitor trends and detect emerging issues.

*Figure 15. Measures and budget (EUR million) for Fundamental rights & Democracy*
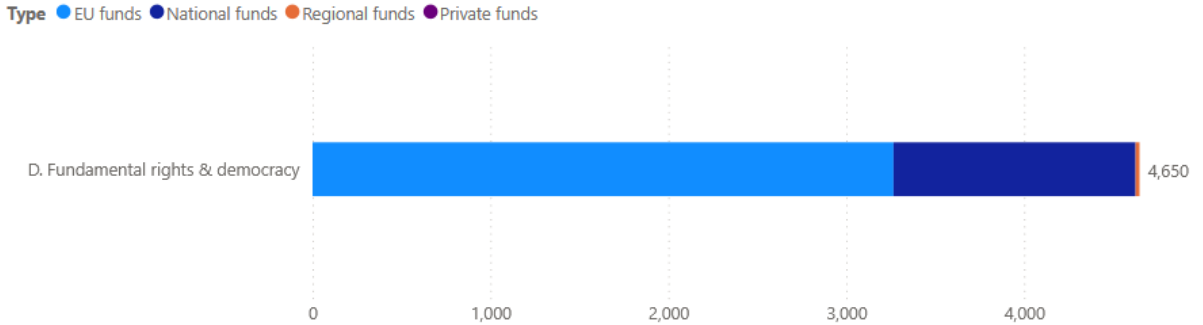
**Measures per Objective**

| Objective category | Measures | Public funds | Private funds |
|---|---|---|---|
| D.1. Protecting and empowering people's rights online | 60 | 4,394 | 0 |
| D.2. Protecting children online | 3 | 11 | 0 |
| D.3. Protecting and empowering democratic values online | 13 | 16 | 0 |
| D.4. Promote human centric and responsible AI systems | 15 | 229 | 0 |
| **Total** | **91** | **4,650** | **0** |

**Measures by MS**

MS ●BE ●BG ●DE ●EL ●ES ●FR ●HR ●IT ●LT ●LU ●NL ●PL ●RO ●SE ●SI ●SK

31 | 5 | 2 | 2 | 9 | 2 | 4 | 7 | 7 | 5 | 2 | 7 | 5 | 91

Count of ID

**Budget per Objective (EUR Mill.)**

Type ●EU funds ●National funds ●Regional funds ●Private funds

D. Fundamental rights & democracy — 4,650

### 4.2.2. Basic digital skills

A total of 26 Member States provided a **trajectory for the at least basic digital skills target**. Most of the national target set for 2030 are in line with the EU target, which is at least 80% of those aged 16-74 having at least basic digital skills. Nine Member States set a target below the EU target and four Member States (Austria, Spain, Finland and Sweden) set a target value above the EU target value. Bulgaria is the only Member State explicitly referring to achieving gender balance for this target.

Member States reported a **total of 292 measures contributing to this target**, with a **total budget of EUR 24.8 billion**. Around 55% of this budget comes from EU sources, around 40% from national sources and the other 5% from regional sources. The roadmaps include several new initiatives: around one third of the measures are reported as new (with a budget share of around 20%).

Around **one third** of the measures focuses on digital skills in **formal education**, including improving digital skills of learners and teachers and providing digital infrastructure/learning resources. **Another third** on **digital inclusion**, including improving digital skills among

vulnerable groups. The **remaining third** is split between measures supporting digital skills of **people currently in employment**, including broad up- and reskilling programmes, and initiatives targeting specific groups like public servants or SME employees, and **governance and other support initiatives,** including supporting a skills ecosystem and monitoring and evaluation activities related to digital skills. A **very small number** of the measures is focused on improving gender balance by increasing the basic and intermediate digital skills of **girls and women** (particularly in Portugal, Italy, Cyprus and Austria).

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**Relevant measure**

**Ireland** has already taken appropriate measures to increase digital skills, including the strategies **Adult Literacy for Life and Digital Strategy for Schools,** both part of Ireland's RRP, and the National Further Education and Training Strategy. The new **Literacy, Numeracy and Digital Literacy strategy** for all learners from birth to young adulthood completes the **holistic approach to digital skills for everyone**. The country launched the STEM Education Implementation Plan to 2026. This is the second implementation plan as part of the STEM Education Policy Statement 2017–2026. In its new Primary Curriculum Framework presented in 2023, Ireland recognized 'Being a digital learner' as a key competency.
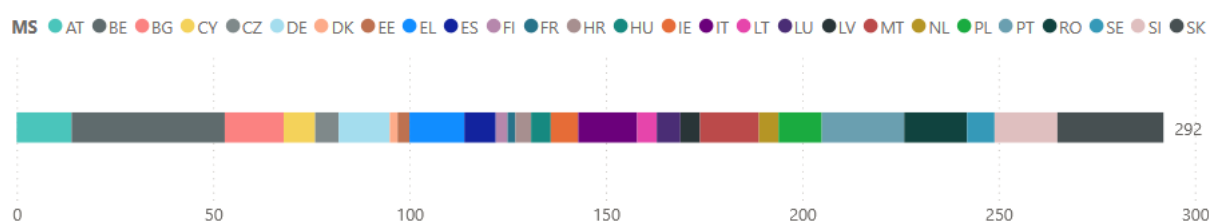
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**Summary of findings**

The measures proposed by Member States account for 18% of the total number of measures and 15% of the total public funds. However, at the current pace, the EU-level target will not be reached without additional efforts. In their roadmaps, Member States can therefore increase their focus on this target, making sure that the measures proposed address the obstacles identified in each country, and cover all the relevant aspects that contribute to increasing the level of digital skills. This includes enhancing the adequacy of the education and training systems, enlarging access to digital tools, and addressing the specific needs of each target group.

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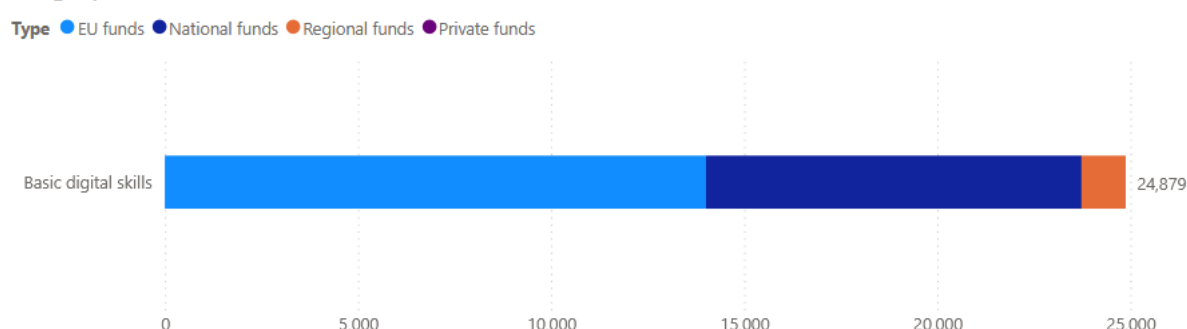*Figure 16. Measures and budget (EUR million) for basic digital skills*

**Measures and budget (EUR Mill)**

| Target category | Measures | Public funds | Private funds |
|---|---|---|---|
| | 3 | 173 | 0 |
| 1. Basic and intermediate digital skills in formal education | 83 | 17,319 | 0 |
| 2. Basic and intermediate digital skills of people currently in employment | 52 | 2,114 | 0 |
| 2. Strengthening of advanced and highly specialised digital skills of people currently in employment | 1 | 20 | 0 |
| 3. Basic and intermediate digital skills of girls and women | 5 | 1,100 | 0 |
| 4. Basic and intermediate digital skills for all to achieve digital inclusion | 97 | 3,015 | 0 |
| 5. Governance and other support initiatives not covered in points 1-4 | 51 | 1,136 | 2 |
| **Total** | **292** | **24,877** | **2** |

**Measures by Member State**

MS ● AT ● BE ● BG ● CY ● CZ ● DE ● DK ● EE ● EL ● ES ● FI ● FR ● HR ● HU ● IE ● IT ● LT ● LU ● LV ● MT ● NL ● PL ● PT ● RO ● SE ● SI ● SK

292

0    50    100    150    200    250    300

**Budget per source (EUR Mill)**

Type ● EU funds ● National funds ● Regional funds ● Private funds

Basic digital skills ——————————————— 24,879

0    5,000    10,000    15,000    20,000    25,000

### 4.2.3. ICT specialists

A total of 24 Member States each provided a **trajectory for the ICT specialists target**. Around half the national targets set for 2030 are in line with or above the EU target. The EU target is to have at least 20 million ICT specialists employed in the EU, while increasing women's participation in the field and boosting the number of ICT graduates. Thirteen Member States set a target below the EU target, and one Member State (Sweden) set a target above the EU target value. Eleven Member States set out their aim to increase the proportion of female ICT specialists, of which four (Poland, Portugal, Sweden and Slovakia) set national targets.

Member States reported a total of 178 measures contributing to this target, with a total budget of EUR 9.5 billion. Around 25% of this budget comes from EU sources, around 55% from national sources and the other 20% from private sources. The roadmaps include several new initiatives: around one third of the measures are reported as being new (with a budget share of around 30%).

Around one third of the measures focuses on digital skills in formal education and higher education, including vocational education and training. Another one third focuses on supporting advanced and highly specialised digital skills of people currently in employment,

including broad upskilling and reskilling programmes, and sector-specific initiatives, for example cybersecurity. The final third of the measures are composed of governance and other support initiatives, including drawing up strategies and action plans on advanced digital skills, improving gender balance by boosting advanced and highly specialised digital skills of women, and attracting and retaining ICT specialists from abroad.

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**Relevant measure (1)**

**In Luxembourg, training in continuous professional education was strengthened in 2023** to help meet the critical need for skilled IT-trained professionals. The Digital Learning Hub launched in 2022 offered 300 courses targeting professionals in traditional and new areas of digital skills (e.g. management and governance; or data and AI). In addition, the Ministry of Gender Equality and Diversity is conducting a study to identify why enrolment rates of female students in ICT trainings and studies in Luxembourg are low. The results of the study will suggest future actions or projects to improve these rates and improve the gender balance.
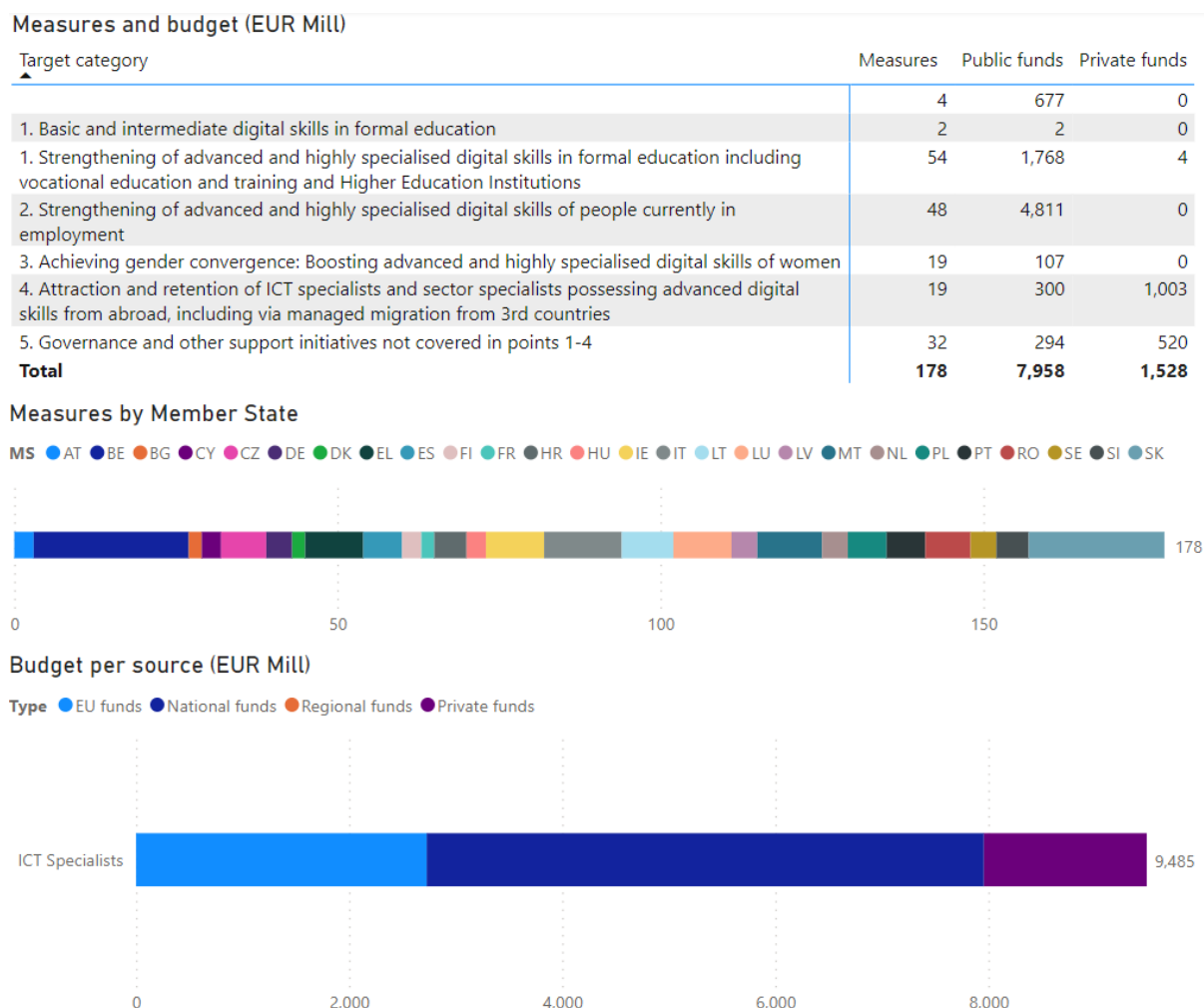
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**Relevant measure (2)**

**The "ICT Re-Up Skilling" programme** is a pioneering collaboration between **the Cyprus government and businesses in the country.** It aims at addressing digital skills gaps and fostering economic resilience, leveraging funding from the European Union's Recovery and Resilience Plan. More specifically, the programme was conceived, planned, and communicated in an inclusive manner, following an analysis of the market needs survey carried out in 2022, whilst ensuring the participation of a diverse public. This pilot initiative focuses on Data Analytics and targets individuals with academic qualifications in STEM and economics, reflecting a broad spectrum of educational backgrounds, emphasising a strategic approach to training selection.

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**Summary of findings**

The measures proposed by Member States account for 11% of the total number of measures and 5% of the total public funds. At the current pace, additional efforts should be taken to reach the EU target by 2030. In their national roadmaps, Member States can step up their commitments, setting out comprehensive strategies and measures covering all the issues that can affect the number of ICT specialists. These commitments can include improving the academic offer and of teachers' skills, promoting ICT and science, technology, engineering and mathematics (STEM) studies, collaborating with industry, attracting and retaining talent (including from non-EU countries), and providing incentives to workers to embark on continuous learning, upskilling and reskilling paths.

The roadmaps can also focus more on the participation of women in ICT/STEM studies and in the ICT sector, tackling the different obstacles (from misconceptions to low participation in the job market).

*Figure 17. Measures and budget (EUR million) for ICT specialists*

**Measures and budget (EUR Mill)**

| Target category | Measures | Public funds | Private funds |
|---|---|---|---|
| | 4 | 677 | 0 |
| 1. Basic and intermediate digital skills in formal education | 2 | 2 | 0 |
| 1. Strengthening of advanced and highly specialised digital skills in formal education including vocational education and training and Higher Education Institutions | 54 | 1,768 | 4 |
| 2. Strengthening of advanced and highly specialised digital skills of people currently in employment | 48 | 4,811 | 0 |
| 3. Achieving gender convergence: Boosting advanced and highly specialised digital skills of women | 19 | 107 | 0 |
| 4. Attraction and retention of ICT specialists and sector specialists possessing advanced digital skills from abroad, including via managed migration from 3rd countries | 19 | 300 | 1,003 |
| 5. Governance and other support initiatives not covered in points 1-4 | 32 | 294 | 520 |
| **Total** | **178** | **7,958** | **1,528** |

**Measures by Member State**

MS ● AT ● BE ● BG ● CY ● CZ ● DE ● DK ● EL ● ES ● FI ● FR ● HR ● HU ● IE ● IT ● LT ● LU ● LV ● MT ● NL ● PL ● PT ● RO ● SE ● SI ● SK



**Budget per source (EUR Mill)**

Type ● EU funds ● National funds ● Regional funds ● Private funds



### 4.2.4. e-ID

e-ID and Digital Wallet trajectories and national targets do not feature widely in the national roadmaps, as this target focuses on those Member States that have notified at least one national e-ID scheme. Member States reported a total of 60 measures contributing to this target, with a total budget of EUR 926 million. 80% of the total budget comes from EU funds, and 20% come from national funds.

43% of the measures are considered new (with a budget of EUR 388 million). A third of the measures concern the deployment of **Electronic Identification and Trust Services**, including certification processes and regulation. Another third of the measures focus on implementing the **European Digital Identity Wallet**, including proof of concepts and pilot projects. The last third are measures focusing on **improving the e-ID framework.**

**Relevant measure (1)**

Launched in **Poland as a digital wallet for documents and services, mObywatel** has become an assistant for handling various official procedures. Since July 2023, the release of mObywatel 2.0 includes also mID, which can be used to confirm the identity of the bearer.

Poland has become the largest country in the European Union to have a digital identity document, and almost 6 million mIDs had been issued by the end of 2023. Thanks to the application, users have access to several other official documents (including mDriving License, Large Family Card, mSchool and Student cards) and services, including reporting environmental violations, checking penalty points or filling ePrescriptions without providing the national identification number.

**Relevant measure (2)**

**The Estonian national law, the Identity Documents Act**, requires that every Estonian above the age of 15 must have an e-ID that is recognised throughout the EU, granting individuals complete control over their identity transactions and shared personal data. Citizens can choose between different eID supplied by the public and private sector. In 2023, to further streamline its e-ID to ensure a secure and user-friendly system, Estonia started renewing its identity management and e-ID strategy for the next 5 years launching a public procurement process.

**Summary of findings**

The measures proposed by Member States account for 4% of the total number of measures and less than 1% of the total public budget set out in the roadmaps. Member States have started proposing measures to implement the EU Digital Identity Wallet, which is to be rolled out to the public by 2026 and the European Digital Identity Framework whose regulation enters into force in 2024. At this stage of the Digital Decade, there are still 5 countries with no measures for this target and 11 with only one measure. Additional measures are needed to facilitate take-up of digital identification means are also expected. Roadmaps have yet to take into account the EU-level recommendations to develop of use cases to support users and service providers.

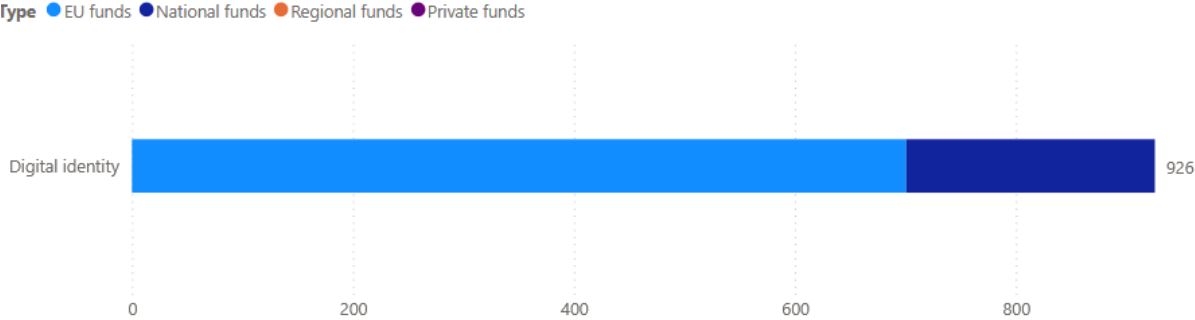*Figure 18. Measures and budget (EUR million) for digital identity*

**Measures and budget (EUR Mill)**

| Target category | Measures | Public funds | Private funds |
|---|---|---|---|
| 1. Deployment of Electronic Identification and Trust Services | 21 | 575 | 0 |
| 1. Human-centric online public services for all | 1 | 38 | 0 |
| 2. Implementation of European Digital Identity Wallet | 19 | 64 | 0 |
| 2. Secure & resilient online public services to the digital economy | 1 | 7 | 0 |
| 3. Improvement of eID framework | 18 | 242 | 0 |
| **Total** | **60** | **926** | **0** |

**Measures by Member State**

MS ● BE ● BG ● CY ● CZ ● DK ● EL ● ES ● FI ● FR ● HR ● HU ● IE ● IT ● LT ● LU ● LV ● MT ● NL ● PL ● PT ● RO ● SE ● SI ● SK

**Budget per source (EUR Mill)**

Type ● EU funds ● National funds ● Regional funds ● Private funds

Digital identity — 926
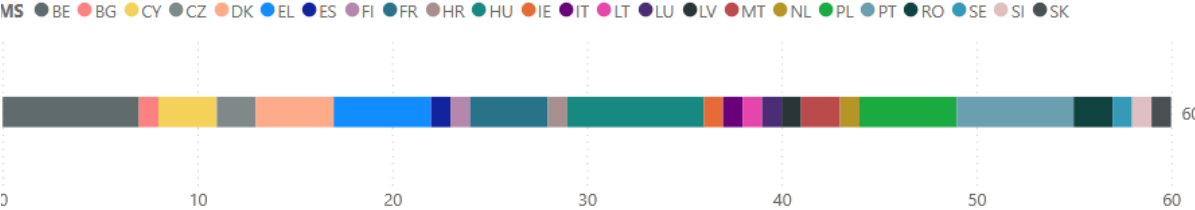
### 4.2.5. Key public services

A total of 22 Member States each provided a trajectory for digital public services for citizens and businesses. There are 20 national targets in line with the EU target, which aims to have 100% of key public services accessible online.

Member States reported a total of 238 measures contributing to this target, with a total budget of EUR 14 billion. Around 50% of this budget comes from EU funds, 40% from national-level funds and 10% from subnational ones. One third of the measures are considered to be new (with a budget of EUR 2.2 billion).

40% of the measures focus on human-centric digital public services for all, including measures aiming to increase the public's trust in and satisfaction with electronic services. 25% focus on making online public services more secure and resilient to the digital economy, including common data and digital services sharing platforms for the public sector. 20% of the measures relate to interoperable digital public services by design, including implementation of the Single Digital Gateway Regulation. The last 15% of the measures can be categorised as related to coordination and the strategic leadership necessary for a digital transition. These include national and subnational strategies, organisational and technical frameworks, and the launch of digital agencies, laboratories or observatories.

**Relevant measure**

In 2023, the Ministry of Economy and Innovation of **Lithuania** announced a call of EUR 94.5 million for the **digitisation of services provided by the public sector**. It includes the creation of new electronic services in state institutions, state enterprises and municipalities, the modernisation of existing ones and the creation of other digital tools. That same year, new electronic services were created and implemented in the Lithuania's Population Register, which can be used by Lithuanian residents and foreigners who have temporary or permanent residence permits in the country. In addition, by the end of 2023, an updated version of the Law on State's Information Resources Management was adopted by the country's Parliament. It sets out a new governance model, which will enable the development of shared information systems, ensure data quality and exchange of data, and allow for the creation of user-friendly electronic services.

**Summary of findings**

The measures proposed by Member States account for 16% of the total number of measures and 8% of the total public budget set out in the roadmaps. Given the current pace of progress, Member States need to take more action to reach the 2030 target. The measures can be better aligned with certain EU-level actions, such as responding to concerns about the dependency of public administrations on foreign technological solutions. In their roadmaps, Member States recognise the importance of adopting emerging technologies in the public sector. More measures are needed on promoting innovative procurement, strengthening accessibility and consolidating interoperable services. The roadmaps can also take into account the EU-level recommendations on multi-country commitments and cooperation in the field of connected public administration.

*Figure 19. Measures and budget (EUR million) for public services*

**Measures and budget (EUR Mill)**

| Target category | Measures | Public funds | Private funds |
|---|---|---|---|
| | 3 | 239 | 0 |
| 1. Human-centric online public services for all | 104 | 5,504 | 0 |
| 2. Secure & resilient online public services to the digital economy | 61 | 3,783 | 0 |
| 3. Interoperable digital public services by design | 49 | 3,850 | 0 |
| 4. Digital transition through coordination and strategic leadership | 21 | 623 | 0 |
| **Total** | **238** | **13,998** | **0** |

**Measures by Member State**

MS ● AT ● BE ● BG ● CY ● CZ ● DE ● DK ● EL ● ES ● FR ● HR ● HU ● IE ● IT ● LT ● LU ● LV ● MT ● NL ● PL ● PT ● RO ● SE ● SI ● SK

238

**Budget per source (EUR Mill)**

Type ● EU funds ● National funds ● Regional funds ● Private funds

Key Public Services — 13,998
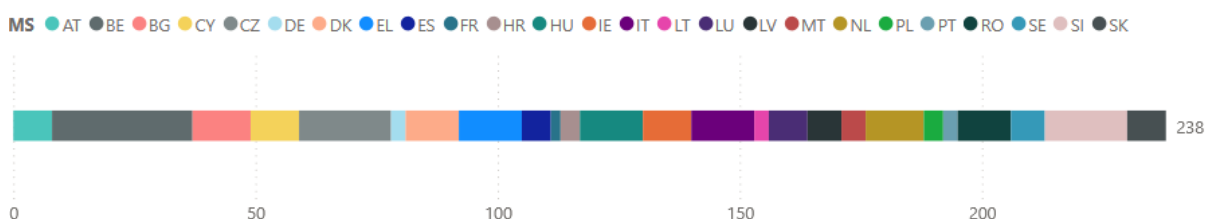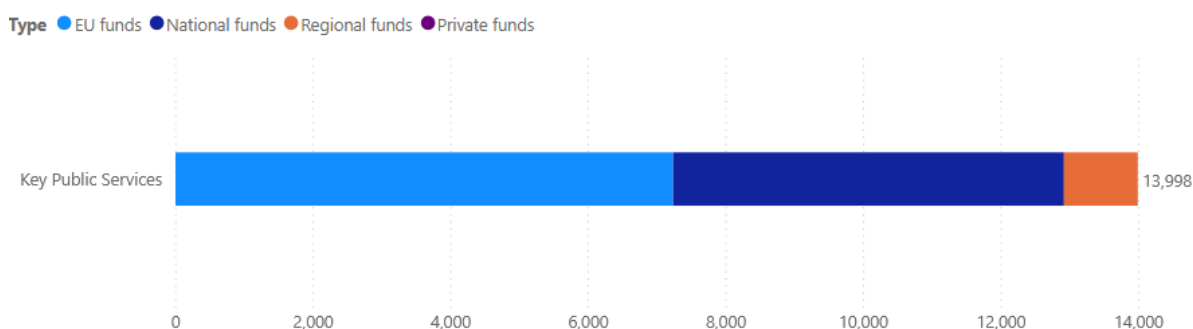
## 4.2.6. e-Health

A total of 23 Members States provided a trajectory for the e-Health composite indicator on the availability of electronic medical data. There are 21 national targets in line with the EU target, which is 100% of citizens having access to their electronic health records.

Member States reported a total of 93 measures contributing to this target, with a total budget of EUR 5.5 billion. One third of the measures are considered to be new (with a budget of EUR 1.2 billion). Around four fifths of the total budget comes from EU funds, and one fifth comes from national funds.

A total of 40 measures focus on health data access for citizens, including portal solutions and applications for mobile devices. Horizontal actions, which account for a third of the measures, include the creation of regulations, roadmaps and cross-border projects. A few other measures include support actions, like the digitalisation of archives, data treatment, and the supply of data by healthcare providers.

**Relevant measure**

A **centralised, nationwide access service** is technically available in **Belgium**. Over 80% of the population is able to access e-Health records through both native mobile application(s) and online portal(s), logging in using an e-ID compliant with eIDAS Regulation. All applicable categories of healthcare providers supply relevant data. Access follows the Web Content Accessibility Guidelines. Furthermore, with the launch of Alivia in 2023 and 2024, the Belgian region of Flanders has a new measure that reflects the region's priority to invest in a digital care and support plan. Alivia aims to contribute to multidisciplinary collaboration and data sharing in the context of integrated care. Data from Alivia can be shared between care providers and with the patient, while respecting medical confidentiality and privacy. The programme is being tested in two pilot regions. It will use a care planning approach and will include an impact assessment and training. With a budget of EUR 19 million , Alivia will be rolled out through Flanders in 2025.

**Summary of findings**

The measures proposed by Member States account for 5% of the total number of measures and 3% of the total public budget set out in the roadmaps. At the current pace of progress, more actions are needed to reach the target on e-Health by 2030.Measures can be better aligned with the development of cross-border access and interoperability, the secondary use of health data and the use of AI in healthcare. Roadmaps have not fully taken into account the EU-level recommendations on the proposed Genome EDIC.

*Figure 20. Measures and budget (EUR million) for e-Health*

**Measures and budget (EUR Mill)**

| Target category | Measures | Public funds | Private funds |
|---|---|---|---|
|  | 3 | 5 | 0 |
| 1. Electronic health data access services for citizens | 40 | 2,378 | 0 |
| 1. Human-centric online public services for all | 2 | 0 | 0 |
| 2. Support for required health data categories | 9 | 1,303 | 0 |
| 3. Interoperable digital public services by design | 1 | 0 | 0 |
| 3. Supply of data by healthcare providers | 11 | 225 | 0 |
| 4.Horizontal actions | 27 | 1,598 | 0 |
| **Total** | **93** | **5,509** | **0** |

**Measures by Member State**

MS ● AT ● BE ● BG ● CY ● CZ ● DE ● DK ● EL ● ES ● FR ● HR ● HU ● IE ● IT ● LT ● LU ● LV ● MT ● NL ● PL ● PT ● RO ● SE ● SI ● SK

93

**Budget per source (EUR Mill)**

Type ● EU funds ● National funds ● Regional funds ● Private funds

e-Health ............................................................ 5,509
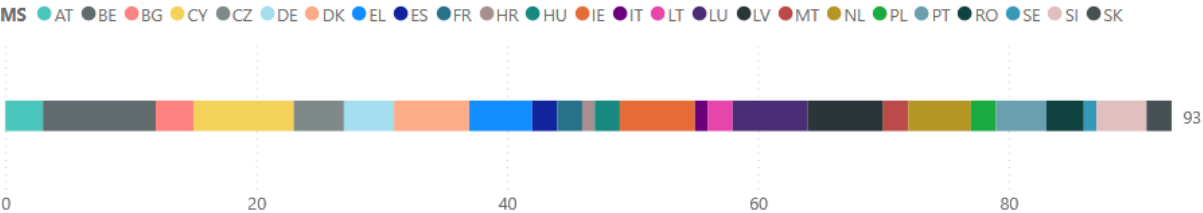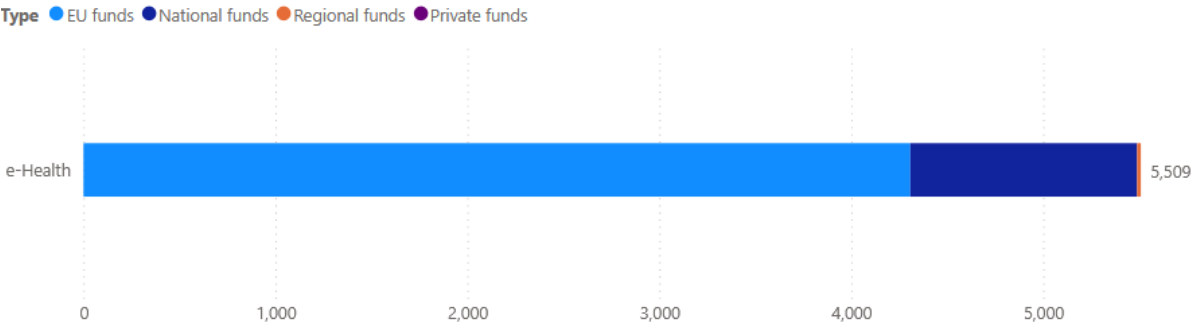
## 4.3. Leveraging digital transformation for a smart greening

Digital transformation is an essential ally in efforts to reduce the EU's environmental footprint. On maximising the positive impact of digitalisation (i.e. digital enablement), the Digital Decade will focus on digitalisation initiatives that can not only deliver environmental and climate benefits, but also support the competitiveness of EU industry (green digital tech) and other EU priorities such as sovereignty (e.g. by reducing dependencies on critical raw materials) or the security and resilience of supply chains. On the greening of the digital sector, the Digital Decade commitments are mostly related to digital infrastructures. Consequently, the focus will be on greening datacentres, telecommunication networks and edge nodes. Some consideration will also be given to AI and semiconductor chips.

## 1. *Sustainable digital infrastructures and technologies*

Only a small number of Member States take sustainable digital infrastructures and technologies into account in their roadmaps (mainly Belgium, France, Germany, Greece, the Netherlands, Luxembourg, Slovenia and Slovakia). Most measures focus on the development and use of energy- and resource-efficient technologies and infrastructure, ranging from reducing e-waste to measures supporting circular and digital business models. Developing

measurements and monitoring the environmental impact of digital technologies, including in the design of new e-services, is also taken into account in a small number of measures.

## 2. *The contribution of digitalisation to the green transition*

The contribution of digitalisation to the green transition has been considered by a small number of Member States in their roadmaps (mainly Croatia, Cyprus, Denmark, Germany, Greece, Romania, Slovakia, Slovenia, Sweden, Spain). The measures include various fields of application, including edge computing and data centres, tourism, energy efficiency of buildings, high-speed connectivity networks and mobility.

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**Relevant measure**

The **Spanish National Green Algorithms Programme** is designed to drive sustainable AI, incorporating eco-friendly features from the algorithm's inception. The initiative addresses the need for environmentally-responsible AI by encouraging research in green tech, promoting energy-efficient infrastructure, integrating green AI and blockchain into the economy, and stimulating the Spanish market through green tech solutions. The programme will include a good practice guide, a catalogue of efficient algorithms and another catalogue of algorithms to tackle environmental problems, the generation of standards for the elaboration of impact calculators for self-assessment, and measures to support the awareness and training of AI developers.

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**Summary of findings**

The measures proposed by Member States make up less than 3% of the total number of measures and less than 1% of the total public budget set out in the roadmaps.

More effort is needed in national roadmaps to strengthen the measures that relate to the sustainability of their digital transformation. They should also consider a wider deployment of digital solutions to support the sustainability targets of climate critical sectors, such as energy, transport, construction and agriculture. This will also boost the competitiveness and growth of the EU's green digital tech market (see the Communication, Thematic Annex).

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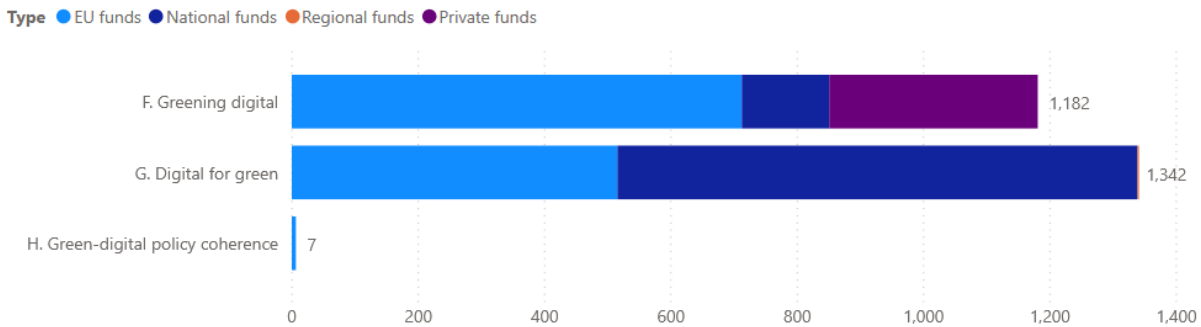*Figure 21. Measures and budget for objectives under the green/digital nexus*

**Measures per Objective**

| Objective category | Measures | Public funds | Private funds |
|---|---|---|---|
| F.1. Footprint. Developing measurements and monitoring the impact | 4 | 9 | 0 |
| F.2. Development and use of energy- and resource-efficient technologies and infrastructure | 14 | 842 | 330 |
| G.1. Use of digital technologies to foster the green transition | 18 | 1,342 | 0 |
| H.1. Ensuring coherence and coordination for policies and programmes to fully contribute to the European green and digital transition | 5 | 7 | 0 |
| **Total** | **41** | **2,201** | **330** |

**Measures by MS**

MS ● BE ● CY ● DE ● DK ● EL ● ES ● FR ● HR ● IT ● LT ● LU ● NL ● RO ● SE ● SI ● SK

| 1 | 1 | 2 | 1 | 6 | 1 | 3 | 2 | 1 | 1 | 4 | 2 | 5 | 3 | 5 | 3 | 41 |

Count of ID

**Budget per Objective (EUR Mill.)**

Type ● EU funds ● National funds ● Regional funds ● Private funds

| | |
|---|---|
| F. Greening digital | 1,182 |
| G. Digital for green | 1,342 |
| H. Green-digital policy coherence | 7 |
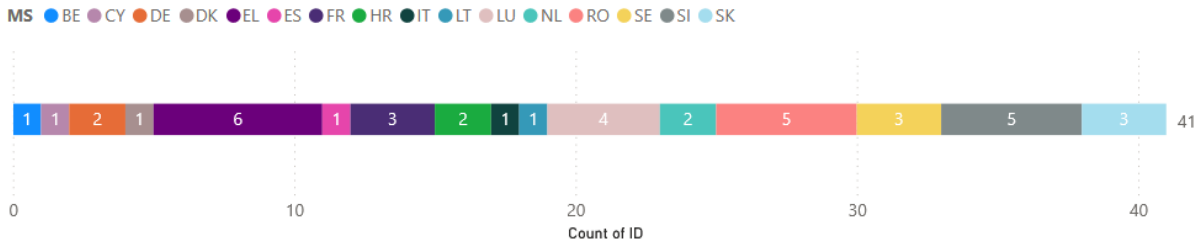
## 5.    COUNTRY-SPECIFIC ANALYSIS

**Austria**

With respect to Austria's contribution to the Digital Decade reflected in its roadmap, it is demonstrating **a low ambition** however, based on this document, intends to allocate **significant effort** to achieve the Digital Decade objectives and targets.

**The roadmap is overall coherent and identifies relevant weaknesses but lacks formal national commitments**. The Austrian roadmap shows that the target for the KPI on access to a secure e-ID has been already achieved and includes 2030 national targets for 3 KPIs (VHCN, 5G, population with at least basic digital skills) but lacks formal national targets for the remaining 12 KPIs. The three 2030 national targets are aligned with the EU 2030 targets (VHCN and 5G) and 'at least basic digital skills' is more ambitious (100% instead of 80%). Trajectories with annual projections until 2030 are missing for **all targets except VHCN and 5G**. The roadmap covers several objectives of the Digital Decade such as resilience, security, and sovereignty. Other dimensions like the green transition could be further explored.

The total budget of the 60 measures proposed **is estimated to EUR 3.4 bn** (about 0.7% GDP) with priorities set on gigabit connectivity and support to start-ups and unicorns. According

with the Austria's roadmap there are currently six unicorns in the country, just one more than the value recorded by [dealroom](), used as data source in this report. Some aspects require more effort, especially for the digitalisation of enterprises (adoption of advanced technologies).

**Belgium**

With respect to **Belgium's** contribution to the Digital Decade reflected in its roadmap, it is demonstrating a **very high ambition** and, based on this document, intends to allocate **some effort** to achieve the Digital Decade objectives and targets.

**Belgium's roadmap is coherent overall with the efforts needed across all the dimensions of digitalisation.** Belgium has integrated the regional dimension of the DDPP, in particular with a dedicated roadmap for Flanders. Belgium has seized the opportunity of its EU Presidency to foster references to the Digital Decade and the Declaration in Council work, as well as to explore **closer cooperation with its regions**. **The total budget for the 161 measures presented in the country's roadmap is estimated to be EUR 892 million (about 0.2% of GDP).** The Belgian roadmap is a **comprehensive exercise, with most measures ongoing or adopted in 2023 and 2024**, and Belgium has prioritised **the digitalisation of key public services and the promotion of basic and advanced digital skills.** The roadmap includes **national target values** for almost all DDPP targets (except FTTP and edge nodes), all matching the level of ambitions in the EU targets. **Recommendations from the State of the Digital Decade 2023 report were taken on board,** especially on coordination and synergies between private and public actors. Nevertheless, as acknowledged in the roadmap, **several of the measures adopted in response to these recommendations have yet to be further advanced** into solid actions.

**Bulgaria**

With respect to **Bulgaria's** contribution to the Digital Decade reflected in its roadmap, it is demonstrating **a high ambition**, and, based on this document, intends to allocate **significant effort** to achieve the Digital Decade objectives and targets.

**Bulgaria's roadmap partly reflects the efforts needed in all the dimensions of digitalisation.** The roadmap presents a realistic, comprehensive assessment of the country's state of play and capacity to achieve the Digital Decade targets, aligning its efforts with the recommendations of the 2023 State of the Digital Decade report. **The total budget for the 60 measures presented is estimated to be EUR 2.19 billion (about 2.3% of GDP). Around three fourths of the roadmap's measures presented are new** and are especially focused on **basic digital skills, the digitalisation of businesses, and of key public services**, which reflect Bulgaria's main areas for improvement. There are **fewer measures on targets and objectives related to connectivity**, although the country is a frontrunner in gigabit connectivity. The roadmap **includes targets and trajectories for all KPIs except for** unicorns. Most targets that Bulgaria has set for 2030 are below the **EU's target levels of ambition, with the exception of digital public services and 5G coverage**. Some aspects require more effort, especially targets for basic and advanced digital skills as well as for the digitalisation of enterprises. Bulgaria only refers once to the Declaration on Digital Rights and Principles in its roadmap. **Limited information is provided on the green transition and Bulgaria could strengthen its narrative** on objectives, in particular in the areas of cybersecurity, resilience and sovereignty, and digital inclusion.

**Croatia**

With respect to **Croatia's** contribution to the Digital Decade reflected in its roadmap, it is demonstrating **a very high ambition** and, based on this document, intends to make a **significant effort** to achieve the Digital Decade objectives and targets.

In March 2024, Croatia adopted its national strategic roadmap, in accordance with Article 7 of the DDPP Decision, following a consultation with a series of workshops with stakeholders and then published it in Croatia's official journal. The Croatian roadmap includes national targets and trajectories for all Digital Decade targets, except semiconductors. All national target values provided are aligned with the 2030 EU targets, except for the ones on the adoption of AI, big data, ICT specialists and 5G, which are lower and justified by the Croatian authorities in view of the national context, starting point and planned measures. Measures in the roadmap are supporting all the Digital Decade targets, although measures on connectivity and digitalisation of business are very likely to fall short of the 2030 target.

**Cyprus**

With respect to **Cyprus's** contribution to the Digital Decade reflected in its roadmap, it is demonstrating a **high ambition** but, based on this document, intends to allocate **some effort** to achieve the Digital Decade objectives and targets.

**The national strategic roadmap of Cyprus is well aligned with the vision of the Digital Decade and is nearing full completion.** It sets out measures for the majority of the targets, and 12 national trajectories to help reach the corresponding targets by 2030. Only trajectories and targets for edge nodes and unicorns are missing. The 5G target has already reached 100% coverage. The national targets are in line with the EU's 2030 target values, except for the percentage of ICT specialists in employment: the national target is cautiously set at 9%, and the EU's is 10%. Some parts of the roadmap could benefit from additional focus and effort, given the current results and the slow annual growth. This particularly concerns improving the population's digital skills, encouraging business take-up of AI, and digitalising public services for citizens. The broad objectives of the Digital Decade are presented alongside existing strategies. In particular, a green digital transition is part of the National Digital Strategy 2020-2025, with a target to reduce the digital sector's environmental impact by 20% by 2025. However, no specific measures are described in the roadmap to accelerate progress on these objectives, even though several initiatives are on-going at national level. The Digital Decade and the Declaration of Digital Rights and Principles are implicitly included in the national strategies for the country's digital transition.

**The total budget of the measures presented is estimated at EUR 497.1 million** (about 1.7% GDP), with priorities set on digitalising public services, promoting the digital transformation of SMEs and creating an innovative ecosystem for start-ups and scale-ups. Funding the digital transformation relies heavily on EU funding (the Recovery and Resilience Facility (RRF) and cohesion policy funding).

**Czechia**

With respect to **Czechia's** contribution to the Digital Decade reflected in its roadmap, it is demonstrating **a very high ambition** however, based on this document, intends to allocate **limited effort** to achieve the Digital Decade objectives and targets.

**Overall, Czechia's roadmap is consistent with the efforts needed to support the country's digitalisation, but the specific targets should be more detailed.** The roadmap includes 2030 targets for all indicators, except for Fibre to the Premises (FTTP) and edge nodes which will be introduced next year. In total, 5 of the national targets are aligned with the EU's 2030 targets, and 7 are lower: VHCN, ICT specialists, SMEs with at least a basic level of digital intensity, the number of unicorn companies, and take-up of AI, data analytics and cloud. There are no trajectories for FTTP and edge nodes. Moreover, on skills, Czechia could make a distinction between basic and advanced skills and set out targeted measures to increase the number of ICT specialists. Although the roadmap partially covers Digital Decade objectives such as online safety, sovereignty, representation of women working in ICT and online access to public services, it does not cover the green transition. The total budget for the roadmap's 58 measures **is estimated at EUR 1.77 billion** (about 0.6% of GDP), prioritising ICT specialists, connectivity, and key public services. Some aspects require more action, especially the aim of business digitalisation (in terms of both basic intensity and the rate of adoption of advanced technologies).

**Denmark**

With respect to **Denmark's** contribution to the Digital Decade reflected in its roadmap, it is demonstrating **a high ambition** and, based on this document, intends to allocate **some effort** to achieve the Digital Decade objectives and targets.

The Danish roadmap is **coherent**, including on objectives, but only partly reflects the efforts needed to achieve the Digital Decade targets. **It includes 2030 national targets for 10** of the 15 key performance indicators (KPIs) but lacks formalised targets and trajectories for **Fibre-to-the-premises (FTTP) coverage, edge nodes and unicorns**. The Fixed Very High-Capacity Networks (VHCN) coverage target is set for 2025, while the 5G target is assumed not to feature because the country has already reached full coverage. In total, 9 of the national targets presented are aligned with the EU's 2030 targets, while **ICT specialists** is below. The roadmap covers all objectives, namely digital citizenship, fostering leadership and competitiveness, and digital for green. With **55 measures** presented, the total reported budget in the roadmap at the time of writing is **estimated at EUR 145.4 million** (less than 0.11% of GDP), with priorities set on quantum, the uptake of key technologies by enterprises and the digitalisation of public services. Some aspects might require more effort, especially for digital skills, boosting the number of edge nodes and the uptake of digital technologies by smaller enterprises.

**Estonia**

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

The roadmap presents one national target out of 15, zero trajectories out of 13 possible and three measures. The roadmap does not present targets nor trajectories on very high-capacity networks (VHCN), Fibre-to-the-Premises (FTTP) coverage, overall 5G coverage, edge nodes, SMEs with at least a basic level of digital intensity, cloud, artificial intelligence, data

analytics, unicorns, ICT specialists, digital public services for citizens, and businesses, nor access to e-health records.

The national target included in the roadmap and the three measures briefly referred to in the roadmap refer to basic digital skills. The national target being 60% is not in line with the EU's level of ambition, which is 80% by 2030. Moreover, with 62.6% of its population having already at least a basic level of digital skills, Estonia has in fact already reached its national target.

Furthermore, the roadmap does not detail the amount of funds dedicated to the Digital Decade. In addition, Estonia did not consult stakeholders on the roadmap. Given Estonia's digital steps forward, it is important that the roadmap reflects these. The roadmap requires more effort in all areas.

**Finland**

With respect to **Finland's** contribution to the Digital Decade reflected in its roadmap, it is demonstrating **a very high ambition** and based on this document, intends to allocate **significant effort** to achieve the Digital Decade objectives and targets.

**The roadmap is ambitious and coherent including all objectives.** Finland's national roadmap includes 2030 targets for all KPIs except for FTTP, edge nodes and unicorns. It also demonstrates ambitions in areas such as semiconductors and quantum. In total, all the national targets presented are aligned with EU 2030 targets. At this stage, trajectories are missing for FTTP, edge nodes, unicorns, take-up of cloud, AI and data analytics, digital public services for citizens and e-health. The roadmap covers all objectives of the Digital Decade, such as technological leadership, sovereignty, competitiveness, cybersecurity, protection of fundamental rights in the digital space and the green transition. The proposed set of measures to achieve them is underpinned by values such as trust and sustainability.

**The total budget for the measures is an estimated EUR 499.7 million (0.2% of GDP).** The priorities are the uptake of cloud, artificial intelligence and data analytics/big data, the development of quantum computing capacities, innovations in connectivity (such as 6G) and increasing RDI expenditure.

**France**

With respect to **France's** contribution to the Digital Decade reflected in its roadmap, it is demonstrating **a high ambition** and, based on this document, intends to allocate **some effort** to achieve the Digital Decade objectives and targets.

**Overall, France's roadmap is ambitious and consistent including on objectives but with some weaknesses in the digitalisation of enterprises**. France's national roadmap includes 2030 targets for all KPIs except for **FTTP and edge nodes** (the former is assumed to be similar to VHCN but needs formalisation). In total, 9 national targets are aligned with EU 2030 targets, but 3 are below: **take up of AI**, **take up of data analytics** and **take up of cloud**. Trajectories are missing for **FTTP, edge nodes** and **unicorns**. The roadmap covers all objectives of the Digital Decade such as a human-centred digital space, resilience and security, sovereignty, green, and protection of the society with a high level of ambition, especially on the human centred digital space, on sovereignty, and on the green transition.

The total budget of the measures (public and private) presented in the roadmap **is estimated to EUR 17.8 billion** (about 0.6% of GDP) with the priorities being semiconductors, connectivity, and e-Health. Some aspects require more action, especially regarding ICT specialists to double the current number of ICT professionals and for the digitalisation of enterprises (both in terms of basic digital intensity and the rate of adoption of advanced technologies).

**Germany**

With respect to **Germany's** contribution to the Digital Decade reflected in its roadmap, it is demonstrating **some ambition** and, based on this document, intends to allocate **very significant effort** to achieve the Digital Decade objectives and targets.

**More specifically, the targets set are ambitious, but not all targets are covered.** The roadmap sets 2030 **targets for 8 KPIs** (VHCN, FTTP, 5G, the AI or cloud or big data joint indicator (the three technologies together), digital intensity, unicorn companies, digital skills and e-health). It sets **no target and therefore also no trajectory for 7 KPIs**: ICT specialists, edge nodes, AI, cloud, big data (separately), digital public services for citizens and for businesses. All the national targets are aligned with the EU's 2030 targets, but **full trajectories are provided for only 2 KPIs**: SMEs with at least a basic level of digital intensity and e-health. **Trajectories with one or two datapoints are provided for 3 KPIs**: FTTP/VHCN and 5G. Although this is not required, the roadmap also provides a full trajectory on quantum, the joint AI or cloud or big data indicator and on e-ID.

The roadmap briefly covers the objectives of the Digital Decade such as digital citizenship, promoting leadership and sovereignty and contributing to the green transition.

The total budget of measures **is estimated** at almost EUR 100 billion (about 2.4% of Germany's GDP), with 60% allocated to fibre roll-out, followed by 17% for semiconductors and 10% for unicorn companies/start-ups. Some aspects require more action, such as the aim to increase the current number of ICT professionals. The roadmap assesses the key challenges related to the targets and analyses the impact of the measures on areas where specific challenges exist.

**Greece**

With respect to **Greece's** contribution to the Digital Decade reflected in its roadmap, it is demonstrating a **very high ambition** and, based on this document, intends to allocate **significant effort** to achieve the Digital Decade objectives and targets.

**The roadmap is mostly complete and presents 14 national trajectories and targets to be achieved by 2030.** The national targets set for connectivity, digital transformation of public services and e-health match the EU's 2030 targets, but the targets for digital skills and for the digital transformation of businesses are below the EU's 2030 targets. The roadmap contains a detailed analysis of the current state of play, and a comprehensive set of measures and initiatives designed to meet the objectives and targets of the Digital Decade to transform the country into a digitally advanced and inclusive society by 2030. It is based on the [Digital Transformation Bible](#) 2020-2025, the country's current national digital strategy. Funding for the digital transformation relies heavily on EU funds (RRF and cohesion policy funding).

**The total public funding for the 104 measures in the roadmap is estimated at EUR 5 230.2 million (about 2.37% of GDP)**. The priorities are on the digital transformation of the public sector including the health sector, the digital transformation of the economy, and the uptake of advanced digital technologies by businesses. The roadmap also gives a rough estimate of private investments for the coming years in data centres and gigabit connectivity of EUR 6 900 million.

## Hungary

With respect to **Hungary's** contribution to the Digital Decade reflected in its roadmap, it is demonstrating a high **ambition** however, based on this document, intends to allocate **some effort** to achieve the Digital Decade objectives and targets.

**The roadmap is overall realistic and comprehensive, but rather cautious when setting targets**. It sets 2030 **targets and trajectories for 12 KPIs** (VHCN, 5G, digital intensity, cloud, big data, AI, unicorns, digital skills, ICT specialists, digital public services for citizens and for businesses, and e-Health). The roadmap includes 2030 targets for all KPIs except for edge nodes. Two national targets (e-health, unicorns) fully correspond to the EU 2030 targets, while 4 national targets are very close to and overall line with the EU target (5G, digital public services for citizens and for businesses, SMEs with at least basic digital intensity). 6 targets are, however, below the EU targets (VHCN, digital skills, ICT specialists, Cloud services, data analytics and AI). In terms of measures, Hungary's roadmap, which was adopted and published in December 2023, presents a comprehensive overview of the nation's digital strategy. The total budget of measures amounts to EUR 2.4 billion (around 1.2% of GDP) with priority given to digital skills and digital infrastructure. In addition, some of the DDPP's objectives, such as those relating to the green transition, competitiveness, sovereignty, leadership, and resilience, including cybersecurity, were also reflected in the document.

## Ireland

With respect to **Ireland's** contribution to the Digital Decade reflected in its roadmap, it is demonstrating **a high ambition** and, based on this document, intends to allocate **very significant effort** to achieve the Digital Decade objectives and targets.

Ireland's national strategic roadmap is aligned with the EU Digital Decade Policy Programme and sets out a comprehensive plan with all sections completed. While the challenges, strengths, and assets are clearly indicated, important information, notably on targets FTTP, edge nodes, and unicorns are missing. The roadmap outlines 59 measures with an estimated budget of EUR 14.9 billion (2.9% of GDP) that are aligned with the targets and objectives of the Policy Programme and the European Declaration on Digital Rights and Principles. Building on existing strategies such as the national digital strategy 'Harnessing Digital', Ireland focuses on digital public services, ICT specialists, and connectivity, with a major emphasis on measures to support unicorns. The roadmap strikes a balance between private and public needs, aligning with the Digital Decade goals of enhancing competitiveness, cybersecurity, and citizen empowerment. Overall, Ireland's roadmap is consistent and innovative, positioning the country on track to meet the EU's digital targets.

**Italy**

With respect to **Italy's** contribution to the Digital Decade reflected in its roadmap, it is demonstrating **a very high ambition** and, based on this document, intends to devote **significant effort** to achieve the Digital Decade objectives and targets. However, **the formal adoption and publication of the roadmap at the national level,** which is crucial for the country to fully commit towards these ambitions, **is still pending**.

The roadmap provides a **complete overview**, covering **all targets to 2030**. While targets are generally ambitious and in line with the EU targets, those on basic digital skills and ICT specialists and on the uptake of Artificial Intelligence (AI) and data analytics remain below the EU levels, reflecting only the measures currently in place. The roadmap outlines a total of over **60 policy measures with a budget of over EUR 32 billion (about 1.6% of GDP)**. Accent is on improving digital skills, ICT specialists and digital public services. However, some areas, including unicorns and uptake of AI, lack targeted measures. A more comprehensive approach could be taken regarding the country's position in key technology areas, such as semiconductors and quantum.

**Latvia**

With respect to Latvia's contribution to the Digital Decade reflected in its roadmap, it is demonstrating a high ambition and it intends to allocate significant effort to achieve the Digital Decade objectives and targets.

The roadmap is **overall ambitious and coherent** including on objectives but with some weaknesses in the digitalisation of enterprises. The roadmap covers all objectives of the Digital Decade such as a human centred digital space, resilience and security, sovereignty, green, and protection of the society with a high level of ambition, especially on the human centricity, and sovereignty.

The roadmap **includes all 2030 KPIs** provides limited information on progress for semiconductors, edge nodes and FTTP. All, but three national targets (basic digital skills, Gigabit and 5G connectivity) are aligned with EU 2030 targets. The roadmap does not provide a national target nor trajectory on FTTP nor edge nodes. In total, the roadmap presents 39 measures.

A public consultation on the roadmap resulted in extensive feedback including from the social partners and non-governmental organisations (NGOs). Latvia has taken this feedback, and the Commission's recommendations from the 2023 report on the Digital Decade into account in the version submitted.

The roadmap's total budget is **estimated at EUR 1 539 million** (about 4.5% of its GDP) with priorities set on developing unicorns, SME take-up and take-up of cloud/AI/big data. Some aspects require further effort, especially in raising the level of digital skills.

**Lithuania**

With respect to Lithuania's contribution to the Digital Decade reflected in its roadmap, it is demonstrating a high ambition and it intends to allocate some effort to achieve the Digital Decade objectives and targets.

The Lithuanian roadmap is **generally coherent and very ambitious** in achieving the Digital Decade targets. It includes 2030 targets and trajectories for all KPIs except for FTTP and Edge nodes. All of them are aligned with the EU targets, except the ICT specialists, which stands quite below. The roadmap **covers all objectives of the Digital Decade**, such as a human-centred digital space, resilience and security, sovereignty, green, and protection of the society with a high level of ambition, especially on the human centricity, sovereignty, and green dimensions.

The roadmap includes 22 measures with a total amount of almost **EUR 1.5 billion** (taking into account all sources: the RRF, EU Funds Investment Programmes and the State budget), which accounts about 2% of its GDP. Regarding the ICT specialists, more ambition is required in order to reach the EU target.

**Luxembourg**

With respect to **Luxembourg's** contribution to the Digital Decade reflected in its roadmap, it is demonstrating a **high ambition** and it intends to allocate **some significant effort** to achieve the Digital Decade objectives and targets.

**The roadmap of Luxembourg sets out a quite detailed plan of actions and trajectories demonstrating willingness to contribute to the EU's Digital Decade common objectives and targets**. Most of the national targets and trajectories for 2030 are provided, except for unicorns. All targets presented are in line with EU target values.

The roadmap is consistent with the objectives of the Digital Decade including policies and measures addressing inclusion, resilience, cybersecurity, technological sovereignty, and sustainability.

The total budget of the measures presented in the national roadmap is estimated at EUR 309.5 million (about 0.39% of GDP) with priorities set on digital skills for all, support to national and European start-ups and scale-ups ecosystem with the goal to increase the number of European unicorns. A large number of measures is also dedicated to reach the objectives of the Digital Decade, in particular in cybersecurity, sovereign cloud, digital innovation, safety online, and accessibility of online services.

**Malta**

With respect to **Malta's** contribution to the Digital Decade reflected in its roadmap, it is demonstrating **a high ambition**, however, based on this document, intends to allocate **very significant effort** to achieve the Digital Decade objectives and targets.

The roadmap is overall coherent with the efforts needed in all the dimensions of digitalisation. The Maltese roadmap includes **66 measures** with a total budget of **EUR 214.65 million (1.5% of GDP) covering most of the targets.** In total, three targets (i.e., VHCN, 5G and Digital Public Service for Citizen) have already been reached, while five others align with EU's 2030 targets. However, according to the Country's roadmap, three national targets (**basic digital skills**, number of **ICT specialist** and **SMEs** with at least a basic level of digital intensity) fall slightly below the EU targets. This seems related to the estimation algorithm used to project historical values up to 2030. Trajectories for **edge nodes, e-Health** and **unicorns** are missing. Although the roadmap covers nearly all objectives of the Digital

Decade, some aspects may require more effort. For instance, elements related to the green and digital activities are notably underreported in the roadmap.

**Netherlands**

With respect to the Netherlands' contribution to the Digital Decade reflected in its roadmap, it is demonstrating **some ambition.** However, based on this document, the country intends to allocate **significant effort** to achieve the Digital Decade objectives and targets.

**The Dutch roadmap is coherent, but only partly reflects the efforts needed to achieve the Digital Decade targets.** It includes 2030 targets for **9 key performance indicators (KPIs)**, but some crucial targets and trajectories like **edge nodes, unicorns, basic digital skills, digital public services for citizens and businesses and access to e-health records** are missing.

Most national targets are in line with the EU's 2030 targets, while **the take-up by enterprises of data analytics and the level of ICT specialists in employment** fall below. The Netherlands maintains in several instances that it is fully committed to realising the EU targets by 2030 and aims to include all of them in the roadmap's future revision. The roadmap covers all Digital Decade objectives, namely digital citizenship, fostering technological leadership and sovereignty and contributing to the green transition.

There are **55 measures**, corresponding to a total budget **estimated at EUR 5.4 billion** (about 0.5% of the GDP), although many measures have no indicated budget and others include approximations. The priorities are set on the digitalisation of key public services, semiconductors and quantum technologies. Some comprehensive efforts have been undertaken, particularly regarding ICT specialists and more targeted efforts for the digitalisation of enterprises, but more could still be done. Some sections, including on creating synergies between the digital and green transitions, could benefit from being more explicit on the planned actions and expected results.

**Poland**

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

**Poland's draft roadmap**[29] **is ambitious and coherent, though there are some weaknesses regarding digital competences and digitalisation of enterprises.** It includes trajectories and national-level targets for all key performance indicators **except for VHCN.**[30] The national targets are mostly aligned with the EU's 2030 targets, except for **ICT specialists, take-up of data analytics** and **take-up of AI**, where they are lower.

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[29] On 30 January 2024, the Polish authorities shared with the Commission a draft roadmap, which has yet to be formally endorsed by the Council of Ministers. At the time of writing, this formal endorsement has yet to take place, hence this report relies on the draft provided in January, which may differ slightly from the final roadmap currently in the adoption process.

[30] However, it provides a trajectory for FTTB, with target of 100% by 2030, which implies the target for VHCN will also be achieved by that time.

**The roadmap identifies key challenges for Poland and covers all Digital Decade objectives**, with a high level of ambition for sovereignty and competitiveness, integration of new technologies, inclusive public services, and cybersecurity. Other dimensions like enhancing digital competences and the green transition could be further developed. It contains also general presentation of expected impacts.

There are **52 measures,** and their **total budget is estimated at EUR 12.4 billion** (about 1.6% of GDP), with priorities set on gigabit connectivity, digitalisation of enterprises, semiconductors, and e-health. Some aspects require more effort, especially on basic digital skills and ICT specialists and adoption of advanced technologies, such as AI and data analytics, by enterprises.

**Portugal**

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

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

**Romania**

With respect to **Romania's** contribution to the Digital Decade reflected in its roadmap, it is demonstrating a **high ambition** and it intends to allocate **some effort** to achieve the Digital Decade objectives and targets, although the **formal adoption of the roadmap at the national level** which is crucial for the country to fully commit towards these ambitions, **is still pending.**

Romania endorsed national targets corresponding to all Digital Decade 2030 targets, with the exception of e-Health, quantum, edge nodes and semiconductors. The targets for digital skills, the digitalisation of business, and 5G coverage are set significantly below the levels of the EU targets.

The 97 measures included in the roadmap build largely on the Romanian Recovery and Resilience Plan (RRP) and, to a more limited extent, on the relevant cohesion funding. Based on the budget information that is included in the plan, it appears that most funding efforts concentrate on the digitalisation of public services (11 measures worth over EUR 1 billion)

and on improving digital skills (23 measures worth over EUR 1 billion), seen as key drivers of Romania's digitalisation. On the digitalisation of businesses, the majority of the measures included in the roadmap are those taken at regional level via the European Digital Innovation Hubs and as such not likely to address all the challenges identified. The roadmap acknowledges that further action is needed to support digital R&D, innovation, and the digital transformation of businesses. Inter-institutional processes have started to develop policies in areas such as semiconductors, quantum and, to a lesser extent, edge nodes, partly building on Romania's participation in multi-country projects. Overall, the roadmap could be further developed to reflect the general objectives of the programme.

**Slovakia**

With respect to **Slovakia's** contribution to the Digital Decade Policy Programme, its national roadmap demonstrates **a high ambition** while it intends to devote **significant effort** to achieve the Digital Decade objectives and targets.

Slovakia's roadmap, published in March 2024, presents a comprehensive overview of the country's digital strategic direction for development. The document provides insights into the state of play, challenges, and strengths across various sectors. In particular, the roadmap outlines numerous targets, most of them (nine targets on connectivity, businesses, and public services) in line with the EU target. It also mentions 113 measures, with a significant commitment to digital advancement, underscored by an estimated budget of EUR 2 270 million (1.8% of GDP).

Some areas are presented in less detail. For example, no detailed measures are mentioned for edge nodes, semiconductors, and quantum technologies. The roadmap partially aligns with key recommendations presented in the Slovak Digital Decade Country Report 2023, with an emphasis on action to improve access to information and knowledge sharing for businesses, including through European Digital Innovation Hubs and action to digitalise public services. However, more ambition is needed on connectivity and digital skills.

**Slovenia**

With respect to **Slovenia's** contribution to the Digital Decade reflected in its roadmap, it is demonstrating a **very high ambition** and it intends to allocate **very significant effort** to achieve the Digital Decade objectives and targets. although **the formal adoption of the roadmap at the national level** which is crucial for the country to fully commit towards these ambitions, **is still pending,"**

Slovenia's roadmap is very **ambitious and coherent, addressing all Digital Decade objectives** through a comprehensive range of measures. Its 2030 targets for the key performance indicators (KPI) are aligned with those of the EU and it introduces additional targets such us the uptake of e-ID. It also includes quantitative estimations of how it expects to help achieve the edge node and semiconductor targets.

The total budget for the measures outlined in the roadmap is estimated to be **EUR 1 billion (approximately 1.7% of GDP),** with the priorities being basic digital skills, digital public services, gigabit connectivity, and the uptake of AI / cloud / data analytics (especially AI). However, more comprehensive action is required to address limitations (e.g. the shortage of ICT specialists in the job market) and bring forward targeted initiatives (i.e. digital

transformation and uptake of advanced technologies by businesses, especially small to medium-sized enterprises (SMEs). Additionally, the roadmap would benefit from a more detailed description of the planned strategies and activities for semiconductors, quantum and AI, including the planned competence centre.

**Spain**

With respect to **Spain's** contribution to the Digital Decade reflected in its roadmap, it is demonstrating a **very high ambition.** However, it intends to allocate **limited effort** to achieve the Digital Decade objectives and targets.

**The Spanish roadmap is ambitious, comprehensive, and coherent with the vision of Spain making a strong contribution to achieving the EU's Digital Decade targets.** Building on the roadmap, Spanish authorities have paved the way for the digital transformation of the Spanish economy throughout the past years, with the document reflecting this vision and commitment. The roadmap presents targets and trajectories for all the Digital Decade targets, except for Edge-nodes. Overall, the targets are aligned with the EU values with the exception of the basic digital skills, which surpasses the EU target, and the ICT specialists, which stands slightly below the EU ambition level. **The roadmap contains up 67 measures with a total budget of EUR 33 750 million** (about 2.3% of its GDP), setting as key deliverables the growth of unicorns, innovative scale-up ecosystem, and the production of semiconductors.

**Sweden**

With respect to **Sweden's** contribution to the Digital Decade reflected in its roadmap, it is demonstrating a **very high ambition** and it intends to allocate **significant effort** to achieve the Digital Decade objectives and targets.

**The roadmap is overall consistent with the efforts needed across all the dimensions of digitalisation. It provides a good overview of the areas where Sweden can contribute to the Digital Decade programme and where Sweden needs to step up its efforts**. The roadmap sets targets and trajectories for most of the KPIs, but some such as the KPIs on VHCN and on access to e-Health records are not expected to achieve EU targets for 2030. Trajectories are based on information available before 1 June 2023. Measures are especially focused on digital skills and digital infrastructures, with fewer measures focusing on the digitalisation of public services. Some aspects require more efforts, such as the greening of digitalisation.

## 6. CONCLUSIONS

The adoption of the national strategic roadmaps is a key step in the implementation of the Digital Decade as they represent a concretisation, at national level, of the European ambition for its digital transformation by 2030.

This first round of national roadmaps marks a successful starting point for discussing, preparing, and sharing the digital transformation for all. For the first time, the EU can count on national roadmaps for all 27 Member States. **This is a real achievement and an important first step**.

However, the overall assessment of this analysis shows that the bar that was defined in the Digital Decade Policy Programme and reflected in the Guidance published by the Commission in 2023 has not collectively been reached. Meaningful information is missing, and the level of ambition often does not match with the collective endeavour. This analysis shows wide differences across Member States, with some having made great efforts to set and achieve a high level of ambition in some areas, while others have failed to do so.

**The initial conclusion is therefore the need for substantial improvement and adjustment, guided especially by the recommendations that are enclosed in the State of the Digital Decade 2024 Communication.** This can be done in the upcoming process, by submitting updated roadmaps, which are expected 5 months after the publication of the second report (i.e., in November 2024).

The starting point is to fill the gaps so that all **targets are covered by national targets and trajectories** reflecting the EU's level of ambition. This ambition needs also to be reflected i**n ambitious measures (**including on budget terms) taken to support progress towards the targets and the objectives with an analysis of the expected impact. Greater attention across the board also needs to be given to **the challenges that single Member States face, as well as on general objectives** (human centred digital space, competitiveness, resilience, sovereignty, inclusiveness, sustainability and greening, consistency of action).and to integrate actions on the Declaration on Digital Rights and Principles to ensure that future cooperation is consistent and efficient. Finally, the **consultation of stakeholders** is a key element of the Digital Decade that needs to be undertaken and appropriately reflected in the national roadmaps.

**Several steps will be followed in 2024 to improve the national roadmaps**. Following an initial round of discussions with Member States based on the analysis and recommendations provided at country level, roadmaps of concerned Member States should be adjusted within 5 months of the publication of the second Digital Decade Report. As proposed by the EU's Energy Roadmap 2050, there is also an opportunity to develop long-term strategic digital transition roadmaps. Additionally, the roadmap preparation processes could be strengthened by actively engaging in discussions with stakeholders and publishing the results and related documentation for public consultation.

# Annex 4    Monitoring of the European Declaration on Digital Rights and Principles

The European [Declaration](#) on Digital Rights and Principles for a Digital Decade provides a vision and concrete commitments for how rights and freedoms enshrined in the EU's legal framework, as well as European values, translate into a digitally transformed world. The Declaration, signed in December 2022, aims to give everyone a clear reference point about the type of digital transformation the EU wants, and provides a guide for policymakers and companies when dealing with digital technologies.

As explained in the Declaration, the EU wants to secure European values by: putting people at the centre of the digital transformation; supporting solidarity and inclusion through connectivity, digital education, training and skills, fair and just working conditions and access to digital public services; ensuring freedom of choice and a fair digital environment; fostering participation in the digital public space; increasing safety, security and empowerment online, in particular for young people; and promoting sustainability.

While the Declaration has a declaratory nature and, as such, does not affect the content of legal rules or their application, its political importance should be underlined. Signed at the highest level of the EU, the signatories have acknowledged that its promotion and implementation are a shared commitment and responsibility of the EU and its Member States. In the same spirit, the Digital Decade Policy Programme (DDPP) Decision provides that Member States and the Commission must take into account the digital rights and principles outlined in the Declaration when cooperating to achieve the general objectives of the DDPP.

This document presents action taken in relation to the digital rights and principles at both European and national level, connecting concrete commitments of the Declaration with adopted initiatives. The document adopts a positive approach: through examples and best practices from across the EU, it illustrates possible ways to promote and apply digital rights and principles, with the aim to inspire further policy and outreach in the areas concerned. This document complements the analysis of progress towards the Digital Decade targets and objectives presented in the State of the Digital Decade Report 2024.

## METHODOLOGY

The Commission has committed to regularly report to the Parliament and the Council on the progress made in promoting and implementing the Declaration. This edition builds on last year's [Staff Working Document,](#) which provided a first mapping of initiatives in the areas covered in the Declaration. This year's document aims to provide a more systematic overview of actions taken, with a particular focus on initiatives regarding digital rights and principles adopted during the past year. The findings cover all commitments of the Declaration and provide an overview of action at both EU and national level. Throughout the document, reference is made to the commitments made in the Declaration by quoting the corresponding number and letter of the commitments.

The findings below draw on various sources: the [Digital Economy and Society Index](#) (DESI); Member States' replies to the Digital Decade fact-finding questionnaires; feedback from stakeholders; various Commission reports, including reports and studies on the

implementation of EU legislation and policies; other reporting mechanisms, such as the monitoring of the Berlin Declaration[31]. Moreover, the document builds on the findings of an independent support study[32] commissioned by the European Commission, which collected additional input from Member States, industry and civil society. Finally, the 2024 Special Eurobarometer Report on the Digital Decade[33] gives an insight into people's perceptions regarding digital rights and principles.

While this document aims at a more systematic monitoring, it is based on available data, which is not always consistent. More comprehensive and systematic data from Member States and stakeholders, industry in particular, remains necessary. The support study includes a number of recommendations to address the gaps identified for further reporting.

KEY FINDINGS AND MAIN RESULTS OF THE SPECIAL EUROBAROMETER SURVEY

The European Declaration on Digital Rights and Principles offers citizens a bridge to Union digital laws and policies, as it indicates the direction of travel of the Union on its journey to digital transformation. This document aims to show how much the EU and Member States stay on course during this journey.

Overall, **the EU continued to be quite active in promoting and applying its human-centric and fundamental-rights based approach to digital transformation**. Some of its milestone digital rules became applicable over the past year, such as the Digital Services Act and the Digital Markets Act, and the Commission started enforcing them without delay. Other important pieces of legislation, like the Artificial Intelligence Act, the European Digital Identity Framework or the Ecodesign Regulation, have been agreed by the co-legislators and will undoubtedly help ensure respect for fundamental rights in the digital environment in the years to come.

According to the findings of an independent study to support the monitoring of the Declaration on Digital Rights and Principles[34], commissioned by the European Commission, **Member States have been most active on commitments related to facilitating digital education, training and skills, digitalising public services, and protecting children and young people in the digital environment**, at least in terms of number of initiatives implemented. On the other hand, Member States were less active on commitments in other areas, in particular regarding sustainable technologies, and the need to ensure a fair digital environment.

Moreover, European citizens should be aware, and made aware, of their rights if they are to exercise them in a digitally transformed society and economy. This year has seen an increase in awareness. According to the 2024 Special Eurobarometer[35], **62% of citizens are aware**

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[31] At the signature of the Berlin Declaration on Digital Society and Value-Based Digital Government on the 8th of December 2020, the European Commission was asked to monitor progress on its implementation. For previous reports see: https://joinup.ec.europa.eu/collection/nifo-national-interoperability-framework-observatory/berlin-declaration-monitoring-mechanism. The 2024 report is expected to be released later in 2024.

[32] 'Study to support the monitoring of the Declaration on Digital Rights and Principles', June 2024, https://digital-strategy.ec.europa.eu/en/news-redirect/833359.

[33] Special Eurobarometer 551 'The Digital Decade' 2024: https://digital-strategy.ec.europa.eu/en/news-redirect/833351.

[34] 'Study to support the monitoring of the Declaration on Digital Rights and Principles', June 2024, https://digital-strategy.ec.europa.eu/en/news-redirect/833359.

[35] Special Eurobarometer 551 'The Digital Decade' 2024: https://digital-strategy.ec.europa.eu/en/news-redirect/833351.

**that their rights that apply offline should also be respected online** (with significant variations across EU Member States), a non-negligible 5 percentage points increase compared to last year's survey (57%). Reversely however, more than one out of three citizens (37%) are still not aware (compared to 41% last year). There is no room for complacency despite the progress. There is a clear need to further promote the Declaration, not only at EU but also at national, regional and local level.

Greater awareness of the digital rights and principles across Member States allows people not only to take ownership but also to claim their digital rights if needed. Regrettably, citizens' overall perception of the protection of their rights in the digital environment has decreased since last year. **Less than half of Europeans (45%) feel that the EU protects well their digital rights in 2024**, a decrease of 5 percentage points compared to 2023 (50%). In addition to this, an increased number of Europeans do not feel well protected in the digital environment: 44% in 2024, compared to 36% in 2023, a difference of 8 percentage points.

Turning to the rights and principles themselves, and in particular to the question how well citizens think specific digital rights and principles are applied in their country, the following lessons can be drawn from the 2024 Eurobarometer survey.

**A significant majority of Europeans (at least 60%) consider that freedom of expression and information online are well protected in their country, as well as the principle of getting necessary basic or advanced digital education, training and skills**. Furthermore, a majority of them also believe that: it is easy to access digital public services; people have access to an affordable high-speed internet connection; people working in the digital environment are benefitting from fair and healthy working conditions; the principle of access to safe and privacy-friendly digital technologies is well protected; the principle of a trustworthy, diverse and multilingual digital environment, including more diverse content, less disinformation, and less illegal content, is well protected in their country; they are getting effective freedom of choice online, including when interacting with artificial intelligence; their privacy online, i.e., respect for the confidentiality of communications and information on devices, is well protected; they are getting access to digital products and services that minimise damage to the environment and society; the principle of getting access to the right information on the environmental impact and energy consumption of digital technologies is well protect. **Nevertheless, with the principle of an inclusive transformation in mind, and while noting the relative progress over the last year in the above domains, it cannot be satisfactory that one third or often more Europeans find that these digital rights and principles are not well applied in their country.**

**Protection of children and young people online is a topic that Europeans remain concerned about**, as appears from the Eurobarometer survey. Overall, a majority (53%) are worried about the safety of children online in their country, a significant increase compared to 43% last year. Only 39% of Europeans (compared to 45% last year) consider that their country is ensuring safe digital environment and content for children and young people.

Against the above perceptions, and building on the support study, the present document is aiming to present and analyse how the EU and Member States have progressed in their follow-up to the principles and commitments contained in the six chapters of the Declaration. When available, best practice recently put in place at national or local level is highlighted.

**The Monitoring of Digital Rights and Principles**

**Chapter I - Putting people at the centre of the digital transformation**

Putting people at the centre of the digital transformation of our societies and economies is at the core of the European Union vision outlined in the Digital Decade policy programme general objectives (Article 3) and the European Declaration on Digital Rights and Principles. The Union believes that digital technology should benefit everyone and empower them to pursue their aspirations, in full security and respect for their fundamental rights.

According to the 2024 Special Eurobarometer survey[36], **62% of citizens are aware that their rights that apply offline should also be respected online**. This is a **5 percentage points increase compared to last year** (57%). More than three quarters of citizens seems to be well aware of their digital rights in the Netherlands (85%), Denmark (81%), Luxembourg (81%) and Lithuania (79%). Contrarily, more than a half of citizens is not aware of their digital rights in Bulgaria (64%) and almost a half in Italy and Greece (49%).

**However, there is no room for complacency. Citizens' perception of the protection of their rights in the digital environment has decreased.** Compared to 2023, when half of EU citizens (50%) indicated that they felt well protected in the digital space, **45% of citizens feel that the EU protects well their digital rights** in 2024, a decrease of 5 percentage points. Worse, an increased number of citizens are expressing that they do not feel well protected (44% in 2024, compared to 36% in 2023, that is, a difference of 8 percentage points). Citizens feel most protected in Poland (66%), Ireland (62%), Denmark and Hungary (60%) while half of the citizens from Spain (55%), Greece (51%) and Cyprus (50%) is worried.

Furthermore, Eurobarometer data show that younger, more highly educated people, those with fewer financial difficulties and frequent internet users are more likely to be aware that rights that apply offline should also be respected online and to say that digital rights and principles are applied well in their country.

Turning to 2024 Berlin Declaration Monitoring data[37], **Member States' overall score on the promotion of fundamental rights and democratic values in the digital sphere**, such as non-discrimination, freedom of expression or a high level of consumer protection, **has decreased from 85% in 2022 to 82% in 2023**. Member States have also been slightly less active with regards to translating fundamental rights in the digital sphere into concrete tangible policies by incorporating them into public sector innovation policies and technology procurement rules, scoring 73% (compared to 75% in 2022).

**EU action**

In line with the Declaration, the European Union committed to **strengthening the democratic framework of digital transformation**, and to ensuring that the **EU values of the**

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[36] Special Eurobarometer 551 'The Digital Decade' 2024: https://digital-strategy.ec.europa.eu/en/news-redirect/833351.
[37] The 2024 report on the monitoring of the Berlin Declaration on Digital Society and Value-Based Digital Government is expected to be released later in 2024.

**EU and the rights of individuals as recognised by EU law are respected online as well as offline** *(1a, 1b).*[38]

On 6 December 2023, the Commission adopted an [EU Citizenship Package](#) to strengthen European citizenship rights across the EU. The EU Citizenship Package notably includes a compendium of e-voting and other ICT practices, which shares practices from across Member States on the use of e-voting and digital technology to promote the exercise of electoral rights. The compendium calls on Member States to build in accompanying safeguards to ensure free, fair and resilient elections that fully uphold democratic standards and fundamental rights, including cybersecurity, data protection and inclusion[39]. This reflects the human-centric vision of digital transformation at the core of relevant EU landmark legislation, such as the [Digital Services Act](#) (DSA) or the [Artificial Intelligence (AI) Act,](#) which are discussed in more detail below.

The EU and its Member States have also committed to ensuring **responsible and diligent action by all actors in the digital environment**. Next to digital regulation, a number of stakeholder initiatives have been taken, covering areas such as disinformation, artificial intelligence, sustainability, as will be explained in the various chapters of this document. *(1c)*

The EU is **promoting this human-centric vision of digital transformation on the international scene**, with the aim to inspire its partners *(1d)*. At multilateral level, the Declaration notably feeds into the United Nations [Global Digital Compact](#), expected to be agreed at the Summit of the Future in September 2024, which aims to outline a global vision and a set of commitments for the digital future at a global level. The Proposal for the European Declaration on Digital Rights and Principles also inspired the 2022 [Declaration on the Future of the Internet,](#) which promotes a trusted internet globally and currently has 70 signatories, including 8 new partners since 2023.

The Commission was also closely engaged in the consultation process on the November 2023 UNESCO [Guidelines for the Governance of Digital Platforms](#). These Guidelines reflect key principles of the DSA, including on safeguarding fundamental rights[40]. In December 2023, G7 leaders endorsed [International Guiding Principles and Code of Conduct for generative AI](#), the most advanced product of international collaboration on AI so far, reflecting the key features of the AI Act. In August 2023, the G20 digital ministers agreed on a [Joint Declaration](#) reflecting notably the EU vision that digital public infrastructure should be secure and operated in a trustworthy way.

As regards bilateral cooperation, the ministerial meeting of the [EU-US Trade and Technology Council](#) (TTC*)*, held in Belgium in April 2024, led to the release of concrete deliverables and actions to defend human rights and values in the changing geopolitical digital environment, reflecting the DSA principles, including on the protection and empowerment of children and

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[38] In this and following chapters, reference is made to the commitments made in the [Declaration](#) by quoting the corresponding number and letter of the commitments. All commitments of the Declaration are covered.

[39] See also Chapter IV below.

[40] See OECD Report on disinformation and information integrity notably reflects key considerations of the DSA including on transparency, accountability and the independence of regulators, https://www.oecd.org/publications/facts-not-fakes-tackling-disinformation-strengthening-information-integrity-d909ff7a-en.htm.

youth in the digital environment, access to data from online platforms for researchers, as well as joint principles on combatting gender-based violence on online platforms.

On AI, the EU and the US reaffirmed their joint understanding on the need for safe, secure and trustworthy development of AI and will continue to jointly coordinate contributions to multilateral initiatives and UN processes to advance the responsible stewardship of AI. The EU and US also agreed to further cooperate on addressing foreign information manipulation and interference to safeguard democracy and fundamental freedoms, as well as support secure and resilient connectivity projects in third countries. In keeping with the Declaration, cooperation on platform regulation, AI, cybersecurity and information integrity also features across EU Digital Partnerships (Japan, Korea, Singapore, Canada).

With regards to data protection and privacy, the Commission developed a joint guide together with ASEAN on the use of model clauses for international data transfers, published in May 2023. In July 2023, the Commission also adopted an Implementing Decision on the EU-US Data Privacy Framework, by which it decided that the US ensures an adequate level of protection for personal data transferred from the EU to organisations in the US that are included in the 'Data Privacy Framework List'.

**Member States action**

**Generally speaking, all EU Member States put forward strategies and initiatives to ensure that technological advancements benefit society as a whole, and activity on digital rights seems to be progressively increasing.** The support study[41] shows these range from legislative and soft-law instruments, to guidelines, codes of conduct or educational initiatives. For instance, the Spanish *Digital Bill of Rights[42]* (2021) reflects a vision of citizens' rights in the digital environment to provide guidance for further national action. Similarly, the Portuguese *Charter on Human Rights in the Digital Age[43]* (2021) commits the country to the global effort to transform the Internet into an instrument to achieve freedom, equality, social justice, where human rights are protected. It addresses the challenges posed by emerging technologies and seeks to protect individuals, particularly women and disadvantaged groups, in the digital realm *(1a,1b)*. To foster responsible action by private actors in the digital environment *(1c),* some Member States have for instance supported digital startups which embed ethical principles.[44] Denmark also established in 2019 a *Data Ethics Council[45]*, which supports the development of digital solutions which respect fundamental rights.

**Member States seem to be most active on commitments related to facilitating digital education, training and skills, protecting children and young people in the digital environment and digitalising public services**, in terms of the number of initiatives implemented. On the other hand, Member States were the least active in areas related to sustainable technologies, especially environmental standards and labels, and in relation to a fair digital environment and protection against exploitation.

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[41] 'Study to support the monitoring of the Declaration on Digital Rights and Principles', June 2024, https://digital-strategy.ec.europa.eu/en/news-redirect/833359.

[42] Digital Bill of Rights, 2021, https://espanadigital.gob.es/en/measure/protection-digital-rights.

[43] Charter on Human Rights in the Digital Age, 2021, https://www.paxlegal.pt/xms/files/LEGAL_FLASH_The_Portuguese_Charter_for_Human_Rights_in_the_Digital_Age.pdf.

[44] For example, Belgium, Denmark, Poland and Portugal.

[45] Data Ethics Council, 2019, https://nationaltcenterforetik.dk/raad-og-komiteer/dataetisk-raad/data-ethics-council.

With regards to actively promoting this human-centric vision *(1d)*, the Netherlands put forward an *International Cyber Strategy 2023-2028[46]*, which aims to reinforce democratic and human rights principles online. Sweden[47] and Bulgaria[48] prepare a similar strategy since last year.

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**Best practice**

In **Belgium**, the City of Brussels launched in October 2023 a [Digital Rights Charter](#), based on the European Declaration on Digital Rights and Principles. The Charter covers all main chapters of the Declaration: digital inclusion and solidarity, freedom of choice, participation in the digital public space, data protection and safety, as well as sustainability. The Charter recalls existing action to protect and promote digital rights and includes further commitments and a list of concrete action to be implemented by 2030. These actions include increasing the number of Wi-Fi points, offering digital skills trainings and workshops on online safety or implementing sustainable IT purchasing practices. This best practice shows how local authorities, which are in direct contact with citizens, can tackle digital rights and transpose the Declaration at city level.

To promote its vision of digitalisation on the international scene, **Denmark** was among the first to include technology and digitalisation in its foreign and security policy since 2017, as a part of its [TechPlomacy](#). Recently, its attention has been shifting towards e.g., cybersecurity, disinformation, responsible AI, and data ethics.

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## Chapter II - Solidarity and inclusion

With the Declaration on Digital Rights and Principles and the general objectives of the Digital Decade, the European Union and Member States stress the need to promote solidarity and inclusion with regards to digital technology and services to support a fair and inclusive society and economy. They have notably committed to making sure that the design, development, deployment and use of technological solutions respect fundamental rights. They have also committed to a digital transformation that leaves nobody behind, which should benefit everyone, achieve gender balance, and include notably elderly people, people living in rural areas, persons with disabilities, and marginalised or vulnerable people. In the context of inclusion, the EU and Member States have also undertaken to develop a digital transformation that promotes cultural and linguistic diversity.

In the 2024 Eurobarometer survey[49], **ensuring that people receive proper human support to accompany the transformation brought by the digital technologies** and services in their lives scored as the most important action that their country should prioritise with regards to digitalisation.

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[46] International Cyber Strategy 2023-2028, 2023,
https://www.government.nl/documents/publications/2023/09/12/international-cyber-strategy-netherlands-2023-2028.

[47] Swedish roadmap for the EU's Digital Decade. https://www.regeringen.se/pressmeddelanden/2023/10/svensk-fardplan-for-eus-digitala-decennium/.

[48] https://egov.government.bg/wps/portal/ministry-meu/press-center/news/news101123.

[49] Special Eurobarometer 551 'The Digital Decade' 2024: https://digital-strategy.ec.europa.eu/en/news-redirect/833351.

According to the 2024 Berlin Declaration Monitoring data[50], **a vast majority (73%) of EU Member States in 2023**, similarly to 2022 (74%), **have been implementing measures to ensure that digital public services and information are inclusive and accessible**, including for persons with disabilities and in line with the EU [Web Accessibility Directive](#) and the [European Accessibility Act](#). Moreover, most Member States (90%) enabled citizens to use their mobile devices to carry out digital public services and cooperated at EU level to ensure mobile device interoperability across borders, which represents an increase of 8 percentage points compared to 2022.

In the Declaration and as general objectives, the EU and Member States have also undertaken to develop adequate frameworks so that all market actors benefiting from the digital transformation assume their social responsibilities and make a fair and proportionate contribution to the costs of public goods, services, and infrastructures, for the benefit of all people living in the EU.

**EU action**

**A number of recent EU digital regulatory instruments are contributing to the development and deployment of technological solutions better respecting fundamental rights**, such as: the risk assessments and mitigation measures of the [Digital Services Act](#); the risk management, fundamental rights assessment of high-risk AI systems under the [Artificial Intelligence Act](#); or the [Cyber Resilience Act](#) agreed in 2023, which provides for cybersecurity requirements governing the planning, design, development and maintenance of software and products, including regarding privacy and data protection. *(2a)*

In line with the principle that a **digital transformation should leave no one behind** *(2b)*, [AccessibleEU](#) was launched in July 2023 as one of the flagship initiatives proposed by the European Commission Strategy for the Rights of Persons with Disabilities 2021-2030. It works on areas such as built environment, transport, information and communication technologies to ensure the participation of persons with disabilities in all areas of life on equal basis with others. AccessibleEU's main purposes are to share knowledge on all aspects of accessibility and to support EU legislation in the field.

In early 2024, the Commission published a [study](#) on 'Poverty and income inequality in the context of the digital transformation'. This study notably analyses the extent to which each EU Member State are prepared for ensuring a socially fair digital transformation in the coming years, based on both its current situation and future prospects. Key areas of focus include the labour market, digital skills of the population, social protection as well as cross-cutting dimensions, such as the digitalisation level of businesses and the quality of digital infrastructures.

In 2023, the common European data space for cultural heritage[51], which features diverse contents on access to digitised cultural heritage objects related to diversity[52] and inclusion[53], such as under-represented cultures or cross-cultural exchange, notably celebrated 15 years of

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[50] The 2024 report on the monitoring of the Berlin Declaration on Digital Society and Value-Based Digital Government is expected to be released later in 2024.
[51] https://pro.europeana.eu/page/the-common-european-data-space-for-cultural-heritage-faqs.
[52] https://www.europeana.eu/en/world-festival-of-cultural-diversity.
[53] https://www.europeana.eu/en/inclusion-and-diversity-through-citizenship.

the [Europeana initiative](#) and started the integration of the [De-bias project](#) that promotes a more inclusive approach to describing cultural heritage.

The Commission also reflects on a fair contribution of different market actors to the costs of public goods, services and infrastructures in its [White Paper](#) 'How to master Europe's digital infrastructure needs?', for which the public consultation is ongoing until the end of June 2024. *(2c)*[54]

**Member States action**

Besides Member States' strategies and initiatives to promote technologies which respect fundamental rights and promote solidarity and inclusion already mentioned in Chapter I *(2a),* **many Member States have embedded social inclusion in their national digital strategies and action plans**[55]**. A few others have gone a step further and developed national programmes specifically dedicated to tackling social inclusion in the digital environment**.[56] *(2b)*

Member States also provide support to specific groups of citizens, most commonly women, elderly or persons with disabilities to tackle issues such as gender balance in the IT sector, development of rural areas, support for minority languages and enhancing the digital skills of persons with disabilities. Some examples include, creating equal opportunities for disabled pupils in Croatia[57] or empowering women in Latvia to pursue careers in IT.[58] A number of public-private partnerships to create a more digitally inclusive society also exist in countries such as the Netherlands[59], Finland[60], Greece[61] or Belgium.[62]

Many initiatives to develop digital competences and skills in various demographic groups also exist, such as the *Mobile Heroes[63]* project in Slovenia which offers digital skills courses and individual support in the use of digital tools for people over 55 years old and thanks to its 'nomadic nature' covers also remote and rural areas, or a similar French project[64] which aims to support seniors living in rural areas in acquiring basic digital skills.

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**Best practice**

In 2023, **Ireland** has put forward a [Digital Inclusion Roadmap](#), which aims to enable everyone to have the opportunity to use digital services in a meaningful way. The roadmap presents the strategy to achieve digital inclusion through better digital skills, digitalisation of businesses, enhanced digital infrastructure and digitalised public services. The roadmap sets specific targets that should be achieved in each area, including a commitment to have all

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[54] No relevant action reported by Member States on this particular commitment.
[55] For example, Austria, Czech Republic, Estonia, Finland, Lithuania. Malta, Portugal, Slovenia and Slovakia.
[56] For example, Ireland, Luxembourg and the Netherlands.
[57] Attend, project running 2021-2024. https://www.carnet.hr/en/projekt/attend/.
[58] Riga Tech Girls, founded 2016, https://rigatechgirls.com/.
[59] Digital Society Alliance, 2019, https://www.nldigitalgovernment.nl/digital-government-agenda/accessible-understandable-and-intended-for-everyone/.
[60] Partnership Platform, 2021, https://kotoutuminen.fi/en/register-your-organisation.
[61] National Coalition for Digital Skills and Jobs, 2018, https://www.nationalcoalition.gov.gr/.
[62] DigitAll, 2020, https://digitall.be/who-are-we.
[63] MobileHeroes, since 2021. https://simbioza.eu/simbioza-mobiln-potujoca-ucilnica.
[64] Project by Emmaüs Connect, a French NGO, 2023. https://emmaus-connect.org/2023/07/un-numerique-plus-accessible-pour-nos-aine%C2%B7e%C2%B7s-et-en-zone-rurale/.

populated areas covered by 5G by 2030; at least 800 businesses supported by 2026 under the €85 million Digital Transition Fund to support businesses to digitalise; increase the share of adults in Ireland with at least basic digital skills to 80% by 2030; 90% of applicable public services to be consumed online by 2030. The strategy also takes note of other efforts done at EU level, such as the Digital Decade programme and the 2030 Digital Compass.

Another good example is the RETECH initiative in **Spain**. In both 2022 and 2023, the initiative mobilised 530 million euros from the Recovery Plan to respond to different areas of action including the digitisation in rural and depopulated areas. The implementation of digitalisation projects in these areas aims to contribute to boosting local economies and attracts young and qualified profiles.

At local level in **France,** the Observatory of Digital Inequalities in Bordeaux sheds light on critical issues related to digital access or connectivity, based on a survey conducted every other year, engaging over 5000 residents across 28 municipalities. It underscores the existence of a significant digital deficit and the importance of help with digital tools by relatives and friends. These insights help tailor local policies. On the other hand, the City of Ghent in **Belgium** puts forward digital assistance to its citizens, by providing free 'digi-points' where volunteers help citizens with digital questions, related to digital public services or setting up IT devices. Professional social workers are also assisting vulnerable citizens work together to ensure equal accessibility. In 2023, this collaborative effort addressed 16575 digital questions.

## Connectivity

The Declaration provides that everyone should have access to affordable and high-speed digital connectivity everywhere in the EU, while general objectives refer to ensuring that 'digital technologies and services are accessible to all, everywhere in the Union'. This is a key prerequisite in order to promote equal chances in an increasingly digitalised world.

According to the 2024 Special Eurobarometer[65], a majority of Europeans (57%) believe that everyone has access to an affordable high-speed internet connection, an increase of 4 percentage points over 2023 (53%). Nevertheless, **more than one third (35%) stress the need for better connectivity.**

### EU action

The Declaration aims to **ensure that everyone has access to high-quality connectivity**, wherever in the EU, including for those with low income *(3a).* The objective of the Digital Decade Policy Programme is to achieve gigabit connectivity by 2030. Fibre networks, which are critical for delivering this, reach 64% of households. The progress (+13.5%) between 2022 and 2023 seems insufficient to achieve the objective of 100% coverage by 2030.

In line with the Declaration on Digital Rights and Principles but also the European Pillar of Social Rights, the June 2023 Commission Report on access to essential services in the EU has monitored access to essential services such as electronic communications, in particular the **affordability, accessibility and lack of digital skills**. According to the report, beside the availability of connectivity in given areas (and the few people who do not wish to have digital

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[65] Special Eurobarometer 551 'The Digital Decade' 2024: https://digital-strategy.ec.europa.eu/en/news-redirect/833351.

connectivity), barriers to connectivity are mainly related to its affordability, in particular in some Member States, the level of people's digital skills, as well as to disabilities when digital interfaces are not accessible. In a Council Recommendation of September 2022, Member States have been called on to develop robust social safety nets that notably include minimum income benefits and other accompanying benefits giving access to enabling and essential services such as electronic communications.

Regarding availability, and besides universal service rules and policies, the Gigabit Infrastructure Act (GIA) entered into force in May 2024[66]. The GIA aims to **ensure faster, cheaper, and simpler rollout of Gigabit networks** installation, addressing the main hurdles like expensive and complex procedures for network deployment. The act is hence instrumental to achieve the 2030 Digital Decade target on connectivity[67]: ensuring cross-EU access to fast Gigabit connectivity and fast mobile data by 2030. On universal service, the report of the Body of European Regulators for Electronic Communications (BEREC) from March 2024 includes Member States' best practices to support the defining of adequate broadband internet access service.

In its White Paper 'How to master Europe's digital infrastructure needs?', the Commission recalls that adequate broadband internet services, of the quality that is needed to perform basic tasks on-line (e.g. eGovernment services, social media, browsing or performing video calls) is ubiquitous throughout the EU. Universal service obligations are therefore focused on consumers with low income or special needs. The White Paper therefore emphasises that, in the future, a different kind of social exclusion may emerge, that of weaker end-users not being able to benefit from the best available networks due to their localisation, for example rural/remote areas, or due to the price of services. It would therefore be important to ensure that Member States take measures to support such end-users and ensure appropriate geographical coverage.

With regards to **protecting and promoting a neutral and open Internet** *(3b),* the 2023 second Commission's report on the implementation of the open internet access provisions of the 2015 Open Internet Regulation found that net neutrality requirements had generally been respected and the Regulation has been able to stand the test of time. However, concerns of consumer and civil rights organisations were noted about gaps between broadband speed advertised by ISPs and those actually received by consumers. Data about the extent of these gaps was also not always present in the implementation reports prepared by national regulatory authorities.

**Member States action**

When it comes to ensuring access to high-quality connectivity for everyone, including for those with low income *(3a)*, **all Member States have put forward plans to promote better coverage of high-speed broadband**. These are set out in the National Broadband Plans, which Member States adopted to achieve the EU Digital Agenda and Gigabit Society targets. These plans include national targets and in some cases go beyond those set out for broadband

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[66] The Gigabit Infrastructure Act entered into force on 11 May 2024 and will be fully applicable in November 2025.
[67] 2030 Digital Decade targets, https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en.

in the Digital Decade Programme[68], alongside supporting measures such as the use of EU (e.g. RRF) or national funds to subsidise roll-out to areas that would not otherwise be commercially available.[69] A number of Member States have also introduced measures or allocated funds to support 5G mobile deployment including in 'white areas'.[70] Some Member States have complemented supply-side measures with measures which seek to subsidise take-up of high-speed broadband, for example through vouchers (*Cyprus example below*).

With regards to **affordability**, a recent initiative[71] from Spain combines coverage of high-speed Internet with affordability by covering user costs for equipment and installation of the service, while a subsidy programme in Hungary provides access to high-quality connectivity, with a focus on disadvantaged citizens.[72] Affordability of basic broadband Internet has also been tackled through introducing social tariffs for Internet access in the context of provisions on 'universal service' under the EU Electronic Communications Code, including the social Internet offer introduced in March 2024 in Belgium.[73]

Measures to ensure that consumers will benefit from a **neutral and open Internet** *(3b)* have generally been taken under the EU Open Internet Regulation. In this context, all Member States produce annual monitoring reports and a number report that they have gone beyond the minimum provisions in EU law. Several regulatory authorities have introduced tools allowing users to take certified measurements of their broadband speed enabling consumers to take action against broadband providers which fail to deliver on the speeds committed in contracts, including Luxembourg,[74] Poland,[75] and Czechia (*below*).

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**Best practice**

In order to help households access high-speed broadband services, **Cyprus** has put forward a €12 million voucher scheme under the RRF. This 2022 scheme aims to foster digitalisation in Cyprus by providing vouchers to households for high-speed broadband services (at least 200 Mbps download speeds), focusing on those not currently subscribed to a connection providing at least 100 Mbps. The scheme is expected to benefit approximately 82,000 households and is open to all broadband service providers capable of providing eligible services.

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[68] For example, the Irish 2022 digital strategy includes a target that all Irish households and businesses should be covered by a Gigabit network no later than 2028, https://www.gov.ie/en/publication/f1f85-digital-connectivity-strategy/ The Initiative Broadband Austria 2030 aims to achieve nationwide coverage of symmetric Gigabit connections (both fixed and mobile) by 2030. https://data.breitbandbuero.gv.at/PUB_Breitbandstrategie-2030.pdf. France has pursued a strategy to ensure the availability of optical fibre throughout the country.

[69] Countries indicating the use of national or EU funds such as RRF include Austria, Belgium, Bulgaria, Czech Republic, Estonia, Greece, Spain, Finland, France, Croatia, Hungary, Ireland, Italy, Lithuania, Poland, Sweden, Slovenia.

[70] Examples include the 2020 5G Strategy in PT, which sets out 13 actions points with milestones to be reached up to 2025 (https://diariodarepublica.pt/dr/detalhe/resolucao-conselho-ministros/7-a-2020-129106697), and the initiative 'Supporting the development of 5G networks in Slovakia for 2020-2025', adopted in 2019 https://digital-skills-jobs.europa.eu/en/actions/national-initiatives/national-strategies/slovakia-supporting-development-5g-networks. The Belgian national plan for fixed and mobile broadband includes provisions to tackle remaining white areas subject to low speed mobile coverage.

[71] Program for the Universalization of Digital Infrastructures for Cohesion – Rural Demand, 2022. https://portalayudas.mineco.gob.es/InfraestructurasDigitales-DemandaRural/Paginas/Index.aspx.

[72] Digital Renewal Operative Programme Plus, 2021-2027. https://www.palyazat.gov.hu/programok/szechenyi-terv-plusz/dimop-plusz.

[73] Giga Region, 2024. https://www.digitalwallonia.be/fr/programmes/giga-region/.

[74] Check My Net, 2018. https://checkmynet.lu/home.

[75] Pro Speed Test, 2018. https://www.uke.gov.pl/blog/otwarty-internet-co-to-oznacza-dla-ciebie,87.html#!.

Some Member States, including **Czechia**, introduced a tool allowing users to take certified measurements of their actual broadband speed. The Czech [Net Test Tool](#) is a web-based version of a measuring tool that was launched in 2021 for the general public. It enables the performance of certified measurements, which makes it significantly easier for end users to submit claims about Internet access services.

## Digital education, training and skills

The Declaration provides that everyone has the right to education, training and lifelong learning and should be able to acquire all basic and advanced digital skills while the general objective of the Digital Decade commits to 'bridging the digital divide by promoting continuous opportunities for all individuals, developing basic and advanced digital skills and competencies' and to gender balance.

According to the 2024 Eurobarometer[76], **almost one third of Europeans (30%) do not feel appropriately equipped for the digital decade**, with numbers highest among citizens from Greece (43%) and Cyprus (42%). The **majority of Europeans (60%) feel that they are getting necessary basic or advanced digital education, training and skills**, with the best results in Malta (82%) and Luxembourg (75%). Similarly to last year, the 2024 Berlin Declaration Monitoring data[77] shows that while all Member States offered digital skills training for the public sector in 2023 (100%), only 62% promoted initiatives to equip the general public with digital skills.

### EU action

The EU committed to promote **high-quality digital education and training, including with a view to bridging the digital gender divide** *(4a)*. The [Digital Education Action Plan 2021-2027](#) (DEAP) aims to support the adaptation of the education and training systems of Member States to the digital age. Building on the DEAP, the Council adopted in November 2023 two Recommendations: a [Council Recommendation on the key enabling factors for successful digital education and training](#) and a [Council Recommendation on improving the provision of digital skills and competences in education and training](#).[78] While the first Council Recommendation proposes a modern framework of governance, capacity-building and investment for effective and inclusive digital education and training, the second one, related to the second priority of the DEAP, i.e. to enhance digital skills and competences, will support Member States in addressing the need to widen the provision of digital skills.

Still under the DEAP, the Commission continued during 2023 to support and promote the implementation in Member States of [SELFIE](#), a tool funded through the Erasmus programme that allows schools to reflect on their use of digital technology, resulting in the tool reaching 5.5. million users in 83 countries. As part of the efforts to foster women's participation in STEM[79], a total of 10 [ESTEAM Fests](#) were organised in 6 countries in 2023, reaching 850 women and girls. 2023 also marked a year of expansion for the [Girls Go Circular initiative](#),

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[76] Special Eurobarometer 551 'The Digital Decade' 2024: https://digital-strategy.ec.europa.eu/en/news-redirect/833351.

[77] The 2024 report on the monitoring of the Berlin Declaration on Digital Society and Value-Based Digital Government is expected to be released later in 2024.

[78] The two Recommendations are accompanied by a [Staff Working Document](#).

[79] DEAP, Action 13. https://education.ec.europa.eu/focus-topics/digital-education/action-plan/action-13?.

which expanded to 8 additional countries. In 2023, the [European Digital Education Hub](#), whose mission is to overcome the current fragmentation of digital education policy, research, and implementation practices at European level by sharing best practices, peer learning, collaborating across education and training sectors, counted more than 3800 members.

With regards to supporting efforts that allow all **learners and teachers to acquire and share the necessary digital skills and competences, including media literacy, and critical thinking**, another DEAP initiative is worth mentioning. The [Digital Education Hackathon](#) gathered 1.685 participants during its 8 hackathon days in November 2023. In total, 39 local hackathons, organised in 22 countries in both EU and global levels took place, resulting in 225 submitted solutions to diverse digital education-related challenges. *(4b)*

The EU also takes action to promote and support **efforts to equip all education and training institutions with digital connectivity, infrastructure and tools**. *(4c)* The first abovementioned Council Recommendation notably calls on Member States to: integrate digital technologies into teaching and empower teachers to use them; support the development of digital educational tools; and invest in connectivity, digital infrastructure and digital accessibility in education and training.

The EU also committed to give everyone the possibility to adjust to changes brought by the digitalisation of work through **up-skilling and re-skilling**. *(4d)* Besides the second abovementioned Council Recommendation, the 2023 was a European Year of Skills and gave a fresh impetus to lifelong learning, empowering people and companies to contribute to the green and digital transitions, supporting innovation and competitiveness. The Commission established in 2023 a [Cyber Skills Academy](#) which aims to improve the coordination of existing cyber skills initiatives in order to close the cyber security talent gap and strengthen the EU cyber workforce. Under the EU [Pact for Skills](#), stakeholders also created a number of partnerships to commit to training and investing in the reskilling of workers. In 2023, a skills intelligence (Jobs & Skills Trends) [tool](#) in the Europass platform was launched.

Funding used for education and skills initiatives notably includes the Recovery and Resilience Facility (RRF), InvestEU on infrastructure, Digital Europe Programmes (DEP) on advanced digital skills and Connecting Europe Facility (CEF Digital) for connectivity

**Member States action**

Most Member States have developed national strategies, programmes and action plans which outline the overall approach to improving the citizens' digital skills[80]. Furthermore, in other countries, digital education has been embedded as an important policy objective in other national strategies.[81] In order to **bridge the digital gender divide**, some Member States[82] focus on improving the digital skills of women and place emphasis on support for women in STEMs. For example, the initiative *Equality in Tech*[83] (2021) in Finland focuses on promoting gender equality in the tech industry and STEM education. It offers training sessions and

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[80] For example, Austria, Czechia, Hungary, Ireland, Malta, The Netherlands, Slovakia, Slovenia and Spain.
[81] For example, Bulgaria, Denmark, Estonia, Greece, Croatia, Lithuania and Latvia.
[82] For example, Austria, Belgium, Finland, France, Germany, Lithuania and Latvia.
[83] Equality in Tech, 2021, https://plan.fi/plan-lehti/artikkeli/tasa-arvoa-teknologiaan/.

workshops for educators, employers, and policymakers to raise awareness of gender biases and discrimination in the tech sector. *(4a)*

**Member States are very active in supporting the development of digital skills and competences of citizens** *(4b)*. For instance, the Greek *Citizen's Digital Academy[84],* active since 2020, is an initiative of the Ministry of Digital Government to enable Greek citizens free access to high-quality digital education services. It gathers online educational materials, for all levels of digital skills, available for free and accessible to all citizens interested in improving their digital competences.

Some national initiatives also aim to **support teachers and educators**. For example*, the AI school package[85]* (2023) aims to digitalise the Austrian school system and facilitate the integration of AI tools in primary and secondary school curricula. Training and educating teachers about the implementing AI tools into their curricula as well as teaching students about such solutions is one of the main focus areas of the initiative. Through the initiative, teachers also have access to an extensive database of experts, materials and lesson plans which provides them with options for designing their own lessons in an interactive manner.

**Member States also invest in better digital infrastructure, tools and connectivity** *(4c).* For example, the *Nationwide Education Network*[86] in Poland (2017) aims to provide schools with broadband access to secure internet, improving the level of digital competences of pupils, enabling support for the education process in schools through access to resources available on the Internet, and equal educational opportunities for all pupils in Poland, in particular those who live in less densely populated areas. Germany, next to mobilising substantial funds under the Recovery and Resilience Plan to finance technical equipment, has also launched the *Digital School Pact*[87] to improve digital infrastructure in schools.

Member States also allow the workforce to adjust to increasingly digitalized workplaces by providing opportunities to **upskill or re-skill** *(4d)*. These efforts mostly focus on providing training and education to the workforce or attempt to build workers' skills in specific 'future-proof' sectors, such as STEM, IT, and cybersecurity. For example, *Upskills Digital Wallonia[88]* (2021) in Belgium, aims to complement companies' digital transformation initiatives with a skills development component. It identifies the positions at risk and the profiles that, by upgrading or reorienting their skills, could be integrated into the new or heavily transformed positions. Furthermore, the *ALL DIGITAL Initiative*[89] (2022) in Cyprus brings together organisations from various sectors to develop actions that support citizen reskilling through training, resources, and guidance. Similarly, the *Allianz für Digitale Skills und Berufe*[90] (2020) in Austria, focuses on improving basic digital skills for all job profiles and enhancing advanced skills in data science, cyber security, and e-commerce. Its Digital Pioneers

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[84] Citizen's Digital Academy, 2020, https://nationaldigitalacademy.gov.gr/.
[85] AI school package, 2023, https://eeducation.at/community/ki-initiative-des-bm
[86] Nationwide Education Network. The programme was implemented in 2017 by the Ministry of Digitisation in cooperation with the Ministry of Education. https://www.gov.pl/web/edukacja/ogolnopolska-siec-edukacyjna.
[87] Progress Report on the Digital School Pact 2022 – 2023. https://www.digitalpaktschule.de/index.html.
[88] Upskills Digital Wallonia, 2021, https://www.digitalwallonia.be/fr/programmes/upskills-wallonia/.
[89]ALL DIGITAL, 2022, https://digitalcoalition.gov.cy/initiative/all-digital-2/.
[90]Allianz für Digitale Skills und Berufe, 2020, led by the Austrian Federal Ministries of Finance, Labour, and Education, Science and Research. https://www.adsb.gv.at/.

Programme specifically aims to reduce the gender gap within the ICT sector and encourage more women to embark on digital careers.

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**Best practice**

In **Croatia**, two pilot projects, running in 2022-2025, aim to modernise the digital infrastructure of secondary and tertiary educational facilities across the country. The complementary e-Schools and e-Universities projects are implemented through the Croatian Academic and Research Network (CARNET). The e-Universities project foresees investment in improving network and computer infrastructure, introducing digital teaching tools and equipment, and strengthening digital competences for teaching in a digital environment through educational support and programmes. The e-School programme was implemented to modernise the school curricula, equip the classrooms with digital technologies in which teachers can use digital educational content, expand communication beyond the boundaries of the physical classroom and encourage a more active role of students in the educational process.

In **Belgium**, the Betternet initiative offers media literacy programmes for professionals and educational resources for children to increase their media literacy and e-safety.

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### Fair and just working conditions

The Declaration provides that everyone has the right to fair, just, healthy and safe working conditions and appropriate protection in the digital environment. People should be able to disconnect after working hours and benefit from a work-life balance.

The 2024 Special Eurobarometer[91] shows that a **majority (55%) of Europeans think that people working in the digital environment are benefitting from fair and healthy working conditions**, including the work□life balance (an increase of 4 percentage points compared to last year), while one third (32%) thinks the opposite (a decrease of 1 percentage point over last year). The 2024 Berlin Declaration Monitoring data[92] show that in 2023, **73% of Member States initiated expert consultations on healthy and appropriate use of digital technologies and work-life balance** to prevent adverse impact on mental or physical human health development (like in 2022).

### EU action

Following up on the European Parliament 2021 Resolution on the **right to disconnect**[93], the European cross-industry social partners entered into negotiations to review and update their 2002 Autonomous Agreement on Telework, intended to be put forward for adoption in the form of a legally binding agreement implemented via a Directive[94]. As negotiations failed in

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[91] Special Eurobarometer 551 'The Digital Decade' 2024: https://digital-strategy.ec.europa.eu/en/news-redirect/833351.

[92] The 2024 report on the monitoring of the Berlin Declaration on Digital Society and Value-Based Digital Government is expected to be released later in 2024.

[93] European Parliament resolution of 21 January 2021 with recommendations to the Commission on the right to disconnect (2019/2181(INL)), OJ C 456, 10.11.2021, p. 161.

[94] While no right to disconnect exists in EU law as such, the Working Time Directive from 2003 sets minimum daily and weekly rest periods and limits weekly working time and the length of night work. A report on the implementation of the directive, which looks also deals with telework, was adopted in March 2023. See also the Occupational Health and Safety (OSH) Framework Directive 89/391/EEC, the Workplace Directive 89/654/EEC; and the Work-life Balance Directive

late 2023, it is now for the Commission to follow up on the Resolution with a legislative act. As one of the follow-up actions to the Resolution, a preparatory study has been published in March 2024, exploring the social, economic and legal context and trends of telework and the right to disconnect in the context of digitalisation. *(6a)*

With regards to **rights of workers in the digital environment** *(6c),* the Parliament and the Council reached a political agreement in March 2024 on the Commission Proposal for a Directive on improving working conditions in platform work[95]. The Directive includes measures to correctly determine the employment status of people working through digital labour platforms by introducing a rebuttable presumption of an employment relationship. Regarding the **use of algorithmic management**, the Directive requires information to persons performing platform work of the use of automated monitoring or decision-making systems, and aims to guarantee **human oversight** of automated systems, including the right to have automated decisions explained and reviewed. To ensure **platform workers' safety and health**, the Directive obliges digital labour platforms to evaluate the risks of automated monitoring or decision-making systems to the safety and health of workers, to assess whether the safeguards of those systems are appropriate for the risks identified and to introduce appropriate preventive and protective measures. *(6b,6d,6e)*

The Directive will complement not only the General Data Protection Regulation (GDPR) rules on lawful processing and transparency as well as automated decision-making, but also the Artificial Intelligence Act. The AI Act includes specific rules in relation to the design and the quality of data sets used for the development of **high-risk AI applications such as in the workplace**, complemented by obligations for testing, risk management, documentation and human oversight throughout the AI systems' lifecycle. Moreover, the AI Act requires[96] employers to inform workers that they will be subject to the use of the high-risk AI system before putting such a service into service. In addition, the general provisions of the AI Act on safety and human control apply as well to the workplace.

Note as well the ongoing review of the Display Screen Equipment Directive[97], which lays down minimum safety and health requirements for work with display screen equipment, as well as significant activity and research ongoing regarding the impact of digital on work, such as: the JRC 2023 Report on the platformisation of work[98], the report[99] of Eurofound on ethical digitalisation at work, and the European Economic and Social Rights Forum[100] in November 2023 on the use of AI at the workplace and its impact on workers.

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(EU) 2019/1158, which lay down general principles for the protection of workers and the prevention of risks which are also relevant in the context of telework and the right to disconnect.

[95] The agreed text was adopted by the Parliament on 24 April 2024 and still needs to be formally adopted by the Council. Member States will then have two years to introduce the new rules.

[96] Art. 26 (7) of the AI Act.

[97] The Advisory Committee on Safety and Health at work is preparing a draft opinion on the review of Directive 90/270/EEC, which is planned for adoption within 2024.

[98] https://publications.jrc.ec.europa.eu/repository/handle/JRC133016.

[99] https://www.eurofound.europa.eu/en/publications/2023/ethical-digitalisation-work-theory-practice.

[100] https://ec.europa.eu/social/main.jsp?langId=en&catId=88&eventsId=2136&furtherEvents=yes.

**Member States action**

**At Member State level, there are only limited initiatives focused specifically on fair and just working conditions in the digital environment**. Issues of occupational safety and health (OSH) relating to digital workers tend to be addressed through the existing OSH framework. Impacts relating specifically to the interaction of workers with AI, ranging from processing of activity and other personal data to work assignments and assessments for platform and remote workers, tend to be addressed by reference to general AI strategies, labour law and, in most cases, existing privacy regulations. As the latter are mainly linked to GDPR[101], there seems little significant variation across Member States.

Eleven countries[102] have reflected the **right to disconnect** in legal instruments or codes of conduct, with differences in how the right is defined and applied. A few other countries[103] are preparing to implement this right or are waiting for EU action. Some Member States[104] also allow some forms of flexible working. In order to improve the **work-life balance** in the digital environment and promote **healthy working conditions***,* many adjustments were made to teleworking rules in labour laws across Europe as a result of changes in working patterns that began during the COVID-19 pandemic. *(6a,6b)*

Today, the **rights of workers in the digital environment** vary from country to country. The support study identified some Member States[105] introducing a legal presumption of employment and other[106] granting them collective rights, such as the right to collective bargaining or the right to strike, or including them in health and safety policies. For example, Germany gives gig workers entitlements to state pensions and insurance, and Denmark enforces both minimum wage and a 'welfare supplement' to be kept separate form normal remuneration. *(6c)*

With the increase in teleworking, some countries[107] have adopted provisions regarding electronic **surveillance of workers**, including remote workers, and the processing by AI of personal and work-related data. In many other countries, this issue has been handled by modifications of labour or data protection law to include explicit reference to relevant GDPR provisions. At a less formal level, some countries[108] have developed informational and awareness-raising materials to help workers and employers to detect and address unlawful surveillance. *(6c,6d)* Some Member States have also introduced rules on **algorithmic transparency at the workplace** (*6e, see below*).

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[101] Art. 88 GDPR.

[102] Belgium, Cyprus, Greece, Spain, France, Croatia, Ireland, Italy, Luxembourg, Portugal, Slovakia; AT, DE, DK have implicit protection (specified non-working time); IE uses a Code of Practice; IT protects the right only for "smart workers".

[103] Finland, Latvia, the Netherlands, Poland.

[104] Austria, Portugal, Romania, Germany.

[105] For example, Spain, Belgium, Portugal, Croatia.

[106] France, Greece.

[107] For example, Austria, Spain and Finland.

[108] For example, Bulgaria.

A number of Member States have introduced legislation or policies to tackle the challenges resulting from the use of algorithmic management tools at work beyond the area of platform work. **Portugal** recently introduced regulation on algorithmic management at work under the 2023 Decent Work Agenda, which entered into force in May 2023. The law stipulates that collective bargaining agreements can only regulate the use of algorithms and AI in a way that is more advantageous to workers. Job applicants must be informed about the use of algorithms and AI and employers must inform workers of the use of AI for HR purposes. The law further clarifies that rules on non-discrimination also apply to decision-making based on algorithms or other AI systems.

On the occasion of the transposition of the Directive on Transparent and Predictable Working Conditions into national law in 2022, **Italy** introduced further obligations, requiring employers to inform workers of the use of fully automated monitoring and decision-making systems, which are used for hiring, managing, assigning tasks and terminating the relationship. In 2021, **Spain** introduced legislation that mandates companies to inform the works council about the algorithms used in automated decision-making systems which affect working conditions[109]. The Spanish government also published in 2022 a guide on 'Algorithmic information in the workplace', which helps employers to comply with the obligations pertaining to algorithmic transparency both under GDPR and Spanish law.

## Digital public services online

The Declaration states that everyone should have online access to key public services in the EU. Specifically, the EU and Member States committed to facilitating and supporting seamless, secure and interoperable access across the EU to digital public services designed to meet people's needs in an effective manner, including in particular digital health and care services, such as access to electronic health records. A similar commitment is made in the general objective of the Digital Decade. In the Declaration, the EU and Member States committed to ensuring that people living in the EU are offered the possibility to use an accessible, voluntary, secure and trusted digital identity that gives access to a broad range of online services. The EU also aims to ensure that digital public services are accessible to citizens of any Member State without discrimination.

The 2024 Berlin Declaration Monitoring data[110] shows that over the last year, the EU **Member States have increased their activity with regards to promoting the rollout and use of notified eID means and introducing incentives for the private sector** to use European trustworthy and notified eID (an increase from 64% to 80% between 2022-2023). While the 2024 Berlin Declaration Monitoring also shows that **81% of Member States provided easily accessible, user-friendly services and seamless digital public services**, tools and applications, the 2024 Eurobarometer survey[111] shows that **almost one third (32%)**

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[109] Spanish Law 12/2021 states that '[works council have the right] [t]o be informed by the company about the parameters, rules and instructions on which the algorithms or artificial intelligence systems are based, which are used for decision-making practices, including profiling, that may affect working conditions, access and maintenance of employment'.

[110] The 2024 report on the monitoring of the Berlin Declaration on Digital Society and Value-Based Digital Government is expected to be released later in 2024.

[111] Special Eurobarometer 551 'The Digital Decade' 2024: https://digital-strategy.ec.europa.eu/en/news-redirect/833351.

**of Europeans found it is difficult to access digital public services.** The majority of Europeans (58%) however found it easy (an increase of 4 percentage points over last year), in particular in Luxembourg, Finland, Denmark, Poland and Malta (over 70%).

**EU action**

In April 2024, the EU co-legislators have adopted a Regulation establishing European Digital Identity Framework, revising the current eIDAS Regulation. With the new Regulation, **all EU citizens will be offered the possibility to have an EU Digital Identity Wallet** to access public and private online services in full security and protection of personal data all over Europe. Member States will have to provide EU Digital Identity Wallets to their citizens 24 months after adoption of Implementing Acts setting out the technical specifications for the EU Digital Identity Wallet and the technical specifications for certification (*7a*).

Four large-scale pilots, investing more than €90 million, of which €46 million is co-funded by the Commission from the Digital Europe Programme, have started testing the EU Digital Identity Wallet in a range of everyday use-cases, including the Mobile Driving Licence, eHealth, digital payments, and education and professional qualifications. The pilots, kicked off in April 2023 and involving more than 300 private and public entities, will contribute to enhancing the technical specifications of the wallet.

In the meantime, Member States which have notified at least one national **electronic identification (eID)** means under the current eIDAS Regulation are deemed to meet this commitment. In 2023, Liechtenstein, Poland, Slovenia, Bulgaria and Cyprus notified identity schemes for cross-border recognition. By May 2024, only Ireland, Greece, Hungary and Finland (6,9% of the EU population) had no identity scheme pre-notified.

In 2023, the average EU score was 79 out of 100 key public services were available to citizens (from 77/100 in 2022), against a target of making 100 key public services for citizens and businesses accessible online[112].

The Interoperable Europe Act, which entered into force in April 2024, set up a new cooperation framework for EU public administrations to ensure the seamless delivery of public services across borders, and to provide for support measures promoting innovation and enhancing skills and knowledge exchange. It will help the EU and Member States to deliver better public services, **interoperable** by default, to citizens and businesses *(7c)*.

The implementing Regulation on high value datasets (HVDs) which entered into force in February 2023, establishes, based on the Open Data Directive, a list of datasets with a high reuse potential held by the public sector (*7b*). The Open Data Directive sets out six categories of HVDs: geospatial, Earth observation and environment, meteorological, statistics, companies and company ownership, and mobility. By 9 June 2024, Member States had to make them available via application programming interfaces, for free, in a machine-readable format and downloadable in bulk where appropriate. Over the course of 2023, the Commission provided implementation advice to Member States and developed a new standard for metadata DCAT-AP HVD (usage guidelines of DCAT-AP for High-Value

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[112] Communication 'State of the Digital Decade 2024' with annexes, COM(2024) 260: https://digital-strategy.ec.europa.eu/en/news-redirect/833324.

Datasets) that will be key for better findability of the datasets and for the reporting to be provided by Member States to the Commission from 2025.

The 2023 [Regulation on the digitalisation of judicial cooperation](#)[113] establishes a legal framework for the use of electronic communication in judicial cooperation procedures in civil, commercial and criminal matters with cross-border implications. In particular, it lays down rules on: communication between competent judicial authorities and between natural or legal persons and competent judicial authorities; the use of videoconferencing or other distance communication technology; the application of electronic signatures and electronic seals; the legal effects of electronic documents; and electronic payment of fees. Quite significant work[114] is needed to establish a decentralised IT system and a European electronic access point on the e-Justice Portal.[115]

Regarding **health** in particular, political agreement was reached on the proposed [European Health Data Space](#) (EHDS) in March 2024. The EHDS aims to establish a secure framework for health data access and control by citizens and re-use of their data for better research, healthcare and policymaking. It will also help Member States progress towards the target set out in the Digital Decade policy programme, according to which 100% of EU citizens shall have access to their electronic health records by 2030[116].

A number of specific projects (will) also help in this respect, in particular: the eHealth Digital Service Infrastructure, which facilitates cross-border exchange of health data including patient summaries and e-prescription (with EU support and co-financing from EU4Health and CEF; multi-country projects 'EDICs'; multiple actions to support the development and uptake of the European Electronic Health Record Exchange Format (EEHRxF) in EHR products and services (with Horizon Europe, DIGITAL Europe and EU4Health funding); large health data infrastructures (with DEP funding); Genomics Data Infrastructure, European Cancer Imaging Platform, and, soon, a platform for the advanced integration of Virtual Human Twins.

Note as well that, at the end of 2022, the adoption of a Council Recommendation on access to affordable long-term care, which notably calls Member States to roll out accessible technology and digital solutions to support autonomy and independent living.

**Member States action**

A significant portion of the Member States defines the **digitalisation of governmental services as one of the key priorities, included in national strategies, programmes and**

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[113] [Regulation (EU) 2023/2844](#) of the European Parliament and of the Council of 13 December 2023 on the digitalisation of judicial cooperation and access to justice in cross-border civil, commercial and criminal matters, and amending certain acts in the field of judicial cooperation, OJ L, 2023/2844, 27.12.2023. It will apply partially from 2025 as regards videoconferencing and then gradually as of 2028 and 2031.

[114] By way of implementing acts to be adopted between 2024 and 2028.

[115] To note that e-Translation is used in the European e-Justice portal, among others to support multilingual, cross-border communication.

[116] New guidelines for (1) medical imaging studies and reports, and (2) hospital discharge reports were adopted by the eHealth Network (established under Directive 2011/24/EU on the application of patients' rights in cross-border healthcare) in November 2023. These guidelines, which complement existing guidelines on patient summaries, ePrescription/eDispensation, and laboratory results and reports, on electronic cross-border health services provide a list of technical requirements and enablers for implementation.

**action plans**. For example, while in the Netherlands the *Digital Government Agenda*[117] focuses exclusively on the digital public administration, the *Digital Citizenship Charter*[118] in Italy even defines access to digital public services as a right. In most cases digitalising public services seems to be encompassed in programmes and strategies tackling the digital transition and related topics in general, for instance in Portugal's 2020 *Action Plan for the Digital Transition*[119] or the Croatian *Digital Strategy for the period until 2032*[120] published in 2022.

Many Member States[121] provide online access to a variety of public services (e.g., tax return, criminal record, access to a variety of documents, driver's scores, educational achievements/school grades among others), with a focus on implementing **digital identity solutions** *(7a)* that provide secure and accessible platforms for citizens to manage their digital credentials. For example, the *GouvIDapp*[122] in Luxembourg is provided to citizens so they can use their electronic ID card with their smartphone to access online public services and electronically identify themselves. A similar platform is provided in Belgium with the *itsme*[123] mobile application.

Some Member States also aim to ensure **accessibility and re-use of public sector information** *(7b)* and develop open data portals (i.e., portals which provide access to public data collected, generated, and maintained by public sector organisations and published in an open format, allowing re-use of data for business or personal purposes. For example, the *GovData*[124] in Germany provides access to a wide range of public sector information, datasets, and resources. It aims to promote transparency, innovation, and the reuse of public sector data by citizens, businesses, as well as researchers.

**Member States are also taking advantage of the Recovery and Resilience Facility (RRF)** with EUR 48 billion of these funds being allocated to digitalizing public services**, making it the policy areas with the highest investment under the digital transformation umbrella.**[125] For instance, in Latvia, the *Federal Cloud*[126] initiative, which aims to establish a nationwide data storage and computing platform, received EUR 12,5 million in funding. Similarly in Lithuania, the *Transformation of public information technology governance*[127] project which aims to transition budgetary institutions to a centralised cloud-based information and communication technology infrastructure is supported by a EUR 114,9 million grant.

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[117] Digital Government Agenda, 2018, https://www.nldigitalgovernment.nl/digital-government-agenda/.

[118] Digital Citizenship Charter, 2018, https://www.agendadigitale.eu/cittadinanza-digitale/cittadinanza-digitale-ce-sapere-far-valere-propri-diritti/.

[119] Action Plan for the Digital Transition, 2020. https://portugaldigital.gov.pt/wp-content/uploads/2022/01/Portugal_Action_Plan_for_Digital_Transition.pdf.

[120] Digital Strategy for the period until 2032, 2022. https://rdd.gov.hr/UserDocsImages/SDURDD-dokumenti/Strategija_Digitalne_Hrvatske_final_v1_EN.pdf.

[121] For example, Austria, Cyprus, Finland, Croatia, Lithuania, Luxembourg, Poland and Romania.

[122] GouvIDapp, https://ctie.gouvernement.lu/en/dossiers/gouvid/gouvid.html.

[123] ItsMe, https://www.itsme-id.com/nl-BE.

[124] GovData, since 2013, https://www.govdata.de/.

[125] Commission Staff Working Document, Digital Decade Cardinal Points, Accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Report on the state of the Digital Decade 2023, SWD(2023) 571 final.

[126] Federal Cloud, 2022, https://www.varam.gov.lv/lv/investicija-2122i-latvijas-nacionalais-federetais-makonis.

[127] Transformation of public information technology governance, 2021-2027. https://ivpk.lrv.lt/lt/naujienos/ivpk-pradeda-igyventi-projekta-valstybes-informaciniu-technologiju-valdymo-pertvarka/.

Ensuring **cross-border operability of eID services** has mainly been addressed through the implementation of the eIDAS Regulation *(7c)*. Most Member States have implemented nodes with other countries in the eIDAS Network[128] and made cross-border public services accessible to citizens. While the **majority of Member States are providing access to digital health services and medical records** to EU citizens (scoring 79/100, DESI data from 2023), **substantial differences between countries can be observed**, with some Member States not offering this option at all.[129] Initiatives targeting these services appear to focus on either developing and improving digital health services offered to citizens (e.g., Romania has initiated a multiyear partnership[130] with WHO/Europe to enhance its digital health services) or improving the national digital health infrastructure. The later mainly involves creating a national digital health infrastructure to provide citizens and healthcare professionals with access to electronic health records and other digital health services. For example, developments of the *Kanta Services*[131] in Finland and the *Electronic Health Record*[132] in Austria.

Member States have also been using funds available under the RRF to develop and improve digital health services. Finland launched a project *Introducing service-oriented digital innovations[133]* that aims to introduce digital solutions for improving health and social services, support early identification of problems, and increase the use of preventive services. Furthermore, the *Industrial/Business Digital Transformation Programme[134]* is a series of investments in Slovenia aiming to increase productivity and growth through the optimisation of processes and the implementation of advanced digital technologies.

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**Best practice**

In 2023, **Greece** issued a national digital identity wallet. The [Gov.gr Wallet](#) is a mobile application developed in 2023 through which citizens can create, save and check digital identity cards and digital driving licences. The new digital identity cards and driving licences are digital documents issued through gov.gr and are fully equivalent to paper documents, suitable for any legal use within the Greek territory.

Earlier in **Spain**, a digital identity [project Dalion](#) developed by private actors has been launched in 2020. The project aims to promote the use of self-managed identity using blockchain technology. The initiative involves 11 large companies from different private sector industries, together with the Polytechnic University of Madrid. This is the first project using blockchain technology which passed the tests of the financial sandbox coordinated by

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[128] eIDAS Network. See the eIDAS Dashboard coordinated by the European Commission at: https://eidas.ec.europa.eu/efda/browse/notification/eid-chapter-contacts/HR.

[129] DESI 2023 dashboard for the Digital Decade, https://digital-decade-desi.digital-strategy.ec.europa.eu/datasets/desi/charts/desi-indicators?indicator=desi_3b2&breakdown=ent_all_xfin&period=desi_2023&unit=pc_ent&country=AT,BE,BG,HR,CY,CZ,DK,EE,EU,FI,FR,DE,EL,HU,IE,IT,LV,LT,LU,MT,NL,PL,PT,RO,SK,SI,ES,SE .

[130] Romanian partnership with WHO, 2022, https://www.who.int/europe/news/item/29-08-2022-who-europe-and-romania-kick-off-multiyear-partnership-to-improve-digital-health-services.

[131] Kanta Services, 2022, https://www.kanta.fi/en/what-are-kanta-services.

[132] Electronic Health Record, https://www.gesundheit.gv.at/gesundheitsleistungen/elga.html.

[133] Introducing service-oriented digital innovations, 2021, https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/163363/VN_2021_69.pdf?sequence=1&isAllowed=y

[134] Industrial/Business Digital Transformation Programme, 2022, co-funded by the RRF and the Ministry of Economic Development and Technology. https://www.gov.si/zbirke/javne-objave/jr-digit-noo/.

the Spanish Ministry of Economy and Digital Transformation.

## Chapter III - Freedom of choice

### Interactions with algorithms and artificial intelligence systems

The Declaration provides that artificial intelligence (AI) systems should benefit people, including by allowing them to make their own informed choices in the digital environment while being protected against risks and harm to health, safety and fundamental rights.

According to the 2024 Eurobarometer,[135] **only a slight majority (52%) of Europeans believes that they are getting effective freedom of choice online** (an increase of 3 percentage points over last year), **including when interacting with AI** (e.g., chatbots, digital assistants), with the best results in Croatia (71%) and Poland (69%). One third (32%) of Europeans is on the other hand sceptical, especially citizens in the Netherlands (44%) and Cyprus (40%).

Member States seem to pay attention to these issues. The 2024 Berlin Declaration Monitoring data[136] shows that **Member States were more active** in 2023 (73%, compared to 68% in 2022) **in creating value-based, human-centred AI systems for use in the public sector**, notably by stimulating knowledge sharing (90%) and by fostering transparency and accountability (68%), i.e. revealing when automated decision-making processes are used in digital public services.

### EU action

The [Artificial Intelligence Act](#) (**AI Act) adopted in May 2024 aims explicitly to promote the uptake of human centric and trustworthy artificial intelligence, while ensuring a high level of protection of health, safety, fundamental rights**, in line with the Declaration (*9a, 9e*)*.* The AI Act aims to guarantee that individuals benefit from an adequate level of **transparency** when interacting with algorithms and AI and that technology does not pre-empt their choices. To achieve this, the AI Act defines certain AI systems which can have a particularly strong impact on individuals in e.g. education, employment, as high-risk AI applications *(9d)*, and subjects them to obligations of technical documentation, record-keeping, transparency on the functioning of high-risk AI systems, as well as transparency obligations to inform individuals when they are interacting with an AI system.[137] *(9b)*.

To **avoid discrimination**, the AI Act provides for data quality criteria and for data governance, including examination in view of possible biases, and the necessity of human oversight.[138] *(9c)* Furthermore, it sets out provisions on standards and standardisation to ensure that AI is safe and used in full respect for fundamental rights *(9e)*. In this regard, the

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[135] Special Eurobarometer 551 'The Digital Decade' 2024: https://digital-strategy.ec.europa.eu/en/news-redirect/833351.

[136] The 2024 report on the monitoring of the Berlin Declaration on Digital Society and Value-Based Digital Government is expected to be released later in 2024.

[137] AI Act, Articles 11, 12, 13 and 50 respectively.

[138] AI Act, Articles 10 and 14.

Commission already issued, in May 2023, a standardisation request to standardisation bodies in support of EU policy on AI.[139]

As the provisions of the AI Act will enter into application progressively[140], the Commission launched in November 2023 a call for interest for an AI Pact, **seeking the voluntary commitment of industry to anticipate the AI Act** and to start implementing its requirements ahead of the legal deadline. The call obtained responses from over 550 organisations and the new EU AI Office has initiated the development of the Pact. Industry commitments will take the form of pledges to work towards compliance with the upcoming AI Act accompanied with details about concrete actions being carried out or planned to address specific requirements of the future AI Act. The pledges would be collected and published by the Commission.

In March 2024, with the objective to **ensure that AI results are trustworthy**, the Commission has, under the Digital Services Act, asked[141] six very large online platforms and 2 very large online search engines[142] to provide information about their respective mitigation measures for risks linked to generative AI, such as so-called 'hallucinations' where AI provides false information, the viral dissemination of deepfakes, as well as the automated manipulation of services that can mislead citizens.[143] (*9a*)

On the research side, a commitment in the Declaration is to ensure that **research in AI** respects the highest ethical standards and relevant EU law. Under the Horizon Europe and Digital Europe programmes, any project developing, deploying or using AI, has to undergo a screening to check compliance with applicable ethical requirements provided for in the Grant Agreement. *(9f)*

**Member States action**

In the recent years, Member States have come up with many new initiatives related to algorithms and AI, seemingly prompted by growing awareness of the challenges posed by AI development to EU values and objectives[144]. Initiatives across Member States include **national strategies**, both general and AI-specific. The implementation, governance and integration of the strategies varies from high-level green papers to concrete networks with specific budgets, powers of action and objectives. **There has been a strong emphasis on the need for regulation of AI including through including soft law codes or co-regulation. Some national initiatives make explicit reference to the need of international coordination**, through guidelines, standards, frameworks and policies.

Member States have developed a rich variety of tools to deal with algorithms and AI systems, including designating specific regulatory bodies with responsibility for AI regulation, such as

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[139] AI Act, Article 40; C(2023)3215, standardisation request M/593.

[140] The prohibitions of AI systems deemed to be detrimental to the safety and fundamental rights of individuals apply after six months, while the provisions on General Purpose AI will be applicable after 12 months. Finally, the requirements for high-risk applications apply between two and three years after adoption of the AI Act.

[141] https://digital-strategy.ec.europa.eu/en/news/commission-sends-requests-information-generative-ai-risks-6-very-large-online-platforms-and-2-very.

[142] Bing, Google Search, Facebook, Instagram, Snapchat, TikTok, YouTube, X.

[143] For more information about all ongoing DSA enforcement cases with regards to VLOPs/VLOSEs please see: https://digital-strategy.ec.europa.eu/en/policies/list-designated-vlops-and-vloses.

[144] Initiatives covering a broad range of issues related to all commitments in this section.

the Italian telecom regulator[145]. Some also created specific powers to scrutinise and comment publicly on ethical issues relating to AI (*Data Ethics Council* in Denmark[146]) or explicit frameworks for coordinating AI ethics across existing policy domains, such as privacy or security (e.g. Luxembourg[147]). Some Member States have also put forward guidelines for ethical impact assessment of regulations and policies or guidelines and frameworks for responsible and ethical research and deployment, including codes of conduct and 'soft law' instruments.

Most countries are using other forms of 'testbed' to provide real-world evidence and platforms for learning about how AI will evolve with societal, commercial and other systems. They include public-private partnerships, regulatory sandboxes, foresight tools (Greece[148]) and awards to reward measures that raise public awareness and promote best use of responsible AI and ethics (Ireland[149]). National initiatives differ in their focus, with some being technology-specific (e.g. generative AI), or focusing on human capital development, labour (skills, working conditions) or use of AI in government.

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**Best practice**

When it comes to dealing with algorithms and AI at national level, **Denmark**'s Agency for Digital Government has an explicit agenda to ensure that AI contributions to growth and development are human-centric and responsible, shaped by the National Digital Strategy from 2022. In order to create the right conditions for public authorities for the use and development of new technologies, Denmark developed guidelines addressing issues of bias and the ethical implications of automated decisions. The National Uptake Fund for New Technologies, established in 2020, also supports 40 public-sector AI projects both to ensure that the use of AI in the public sector respects ethical principles and identify challenges and provide models for other AI initiatives in the public and private sectors. A similar initiative exists in **Austria** since 2017, where the Council for Robotics and AI develops guidance, regulation and contributes to the national strategy for AI.

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**A fair digital environment**

The Declaration provides that everyone should be able to effectively and freely choose which online services to use, based on objective, transparent, easily accessible and reliable information. Signatories committed, in particular, to ensuring a safe and secure digital environment based on fair competition, where fundamental rights are protected, users' rights and consumer protection are ensured, and responsibilities of platforms, especially large players and gatekeepers, are well defined.

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[145] Proposal of law - Measures on the transparency of content generated by artificial intelligence, 2023. The telecom regulator should control the application of transparency of content generated by AI, impose sanctions, and adopt corrective measures in case of violation. https://www.senato.it/japp/bgt/showdoc/19/DDLPRES/0/1393060/index.html?part=ddlpres_ddlpres1-frontespizio_front01.

[146] Data Ethics Council, launched in 2019, https://dataetiskraad.dk/.

[147] Artificial Intelligence: A Strategic Vision for Luxembourg, 2019. https://gouvernement.lu/dam-assets/fr/publications/rapport-etude-analyse/minist-digitalisation/Artificial-Intelligence-a-strategic-vision-for-Luxembourg.pdf.

[148] Generative AI Greece 2030 "Futures of Generative AI in Greece", 2023. https://foresight.gov.gr/en/studies/Generative-AI-Greece-2030-Futures-of-Generative-AI-in-Greece/.

[149] 'Best Use of Responsible AI and Ethics' award, AI Awards, launched in 2018. https://aiireland.ie/about/.

**EU action**

**With regards to ensuring a fair digital environment** *(11a),* **two groundbreaking pieces of EU legislation became applicable, which aim to create a safer digital space where the fundamental rights of all users of digital services are protected, and to establish a level playing field to foster innovation, growth, and competitiveness.**

The Digital Markets Act (DMA), establishes a set of clearly defined criteria to designate 'gatekeepers', very large online platforms that provide an important gateway between business users and consumers, and whose position can create a bottleneck in the digital economy, and **ensures that these platforms behave in a fair way online**. In September 2023, the Commission designated for the first time six gatekeepers[150] that were required to comply with the rules by March 2024. In March 2024, the Commission opened non-compliance proceedings against Alphabet, Apple and Meta in relation to various obligations[151]. The Commission has also taken investigatory steps with respect to other gatekeepers and obligations. In parallel, the Commission has also continued to work on designations.[152]

The Digital Services Act (DSA) complements the DMA by creating **obligations for providers of online intermediary services to reduce harms and counter risks online**, **introduces strong protections for individual's fundamental and consumer rights online**, and places digital platforms under transparency and accountability framework. Since August 2023, the new rules apply to several designated platforms with more than 45 million users in the EU, the so-called very large online platforms (VLOPs) or very large online search engines (VLOSEs), and as of February 2024, the DSA rules apply to all online intermediaries. As of February 2024, the Board of Digital Services Coordinators has also been established to allow coordination in the enforcement of the DSA between the national Digital Services Coordinators and the Commission. The Commission, in charge of the enforcement of rules for VLOPs and VLOSEs, has designated several online intermediaries as VLOPs and VLOSEs since earlier 2023, and initiated a number of investigations in 2024[153].

With regards to **consumer protection**, the EU is also reviewing its consumer law to assess whether additional legislation or action is needed to ensure that consumers are equally well protected in the digital environment as offline. The results of the Fitness Check of EU consumer law on digital fairness will be published in the second half of 2024.

As part of the Consumer Protection Pledge, 11 major online marketplaces[154] agreed in November 2023, on digital fairness voluntary commitments beyond their legal obligations. The commitments will have effect also for traders offering their products on these marketplaces. Online marketplaces agreed to take specific action to improve the detection of unsafe products sold by third parties before they are sold to consumers (Product Safety Pledge+), to tackle transparency of consumer reviews and influencer marketing, and to

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[150] Alphabet, Amazon, Apple, ByteDance, Meta, Microsoft. In total, 22 core platform services provided by those gatekeepers have been designated.

[151] For more information: https://ec.europa.eu/commission/presscorner/detail/en/ip_24_1689.

[152] For an overview of implementation of the DMA in 2023, see Annual report on the DMA of 6 March 2024, COM (2024)106.

[153] 24 designated VLOPs and VLOSEs of 19 providers in June 2024. More information on enforcement with regards to VLOPs/VLOSEs is available at: https://digital-strategy.ec.europa.eu/en/policies/dsa-enforcement.

[154] Allegro, AliExpress, Amazon, Bol, CDiskount, eBay, eMAG, Etsy, Joom, Rakuten France, Wish.

facilitate the exercise of certain EU consumer rights (Digital Consumer Rights Commitments).

The EU and Member States have also undertaken in the Declaration to promote **interoperability, transparency, open technologies and standards** as a way to further strengthen trust in technology as well as consumers' ability to make autonomous and informed choices (*11b*).[155]

Besides the Interoperable Europe Act and the Open Data Directive, the Data Governance Act[156] applies since September 2023. This cross-sectoral instrument sets requirements applicable to data intermediation service providers, which have in particular to take appropriate measures to ensure interoperability with other data intermediation services. In February 2023, the Commission set up the European Data Innovation Board, an expert group that will facilitate the implementation of the Data Act, including the emergence of additional industry standards, where necessary.[157]

The Data Act, adopted in 2023, provides essential requirements for participants in data spaces that offer data or data services to other participants to facilitate the interoperability of data, of data sharing mechanisms and services, as well as of common European data spaces. Additionally, it aims to facilitate interoperability for the purposes of in-parallel use of data processing services. While the Data Act will apply from September 2025, the Commission is developing model contractual terms on data access and use and standard contractual clauses on cloud computing contracts.

The Commission is also contributing, with Digital Europe Programme funding, to the deployment of Common European Data Spaces[158]. A Data Spaces Support Centre, launched in 2022 and running until 2026, coordinates all relevant actions on the sectoral data spaces to ensure that they develop in a coherent way, are interoperable and benefit from economies of scale using common practices, components and tools. The EU also funds open-source projects under the Next Generation Internet initiative and promotes EU values in international ICT standardisation through Horizon Europe projects and by coordination through public-private partnerships.[159]

**Member States action**

Most Member States' digital policies and programmes seek to support businesses in their digital transformation, with many of them targeting small and medium-sized enterprises (SMEs). Some initiatives aim to facilitate SMEs' entry into the digital market, such as the Austrian *KMU.DIGITAL[160]* initiative of the Federal Ministry of Labour and Economy and Austrian Economic Chambers. It facilitates entry and innovation by providing financial support for consulting services and investments in digitalization projects. Since its inception in 2017, the initiative has funded over 22 000 projects.

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[155] No relevant action reported by Member States on this particular commitment.
[156] Published in the OJ on 3 June 2022.
[157] Commission Decision of 20 February 2023 setting up the European Data Innovation Board, C(2023) 1074 final.
[158] Interoperable, federated data ecosystems that bring together data infrastructures and governance frameworks to facilitate trusted and secure data pooling, access and sharing.
[159] SNS JU, AIOTI, INATBA.
[160] KMU.DIGITAL, https://www.kmudigital.at/.

Most initiatives at national level implement EU law or amend national consumer protection laws. Czech Republic[161] and Ireland[162] for instance have recently updated their consumer protection law to deal with new digital issues (2022). Several countries have also begun to address consumer protection issues associated with the use of online influencers, either in stand-alone measures or as part of comprehensive online harms legislation, such as France with its digital law *Securing and regulating the digital space[163],* adopted in May 2024. It contains measures covering such issues as age verification, blocking access to pornographic and other proscribed or harmful content, a requirement on platforms to block users found to have committed specific offenses and a national cybersecurity filter, which applies warning messages to non-compliant sites. *(11a)*

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**Best practice**

When it comes to consumer protection and the use of online influencers, two 2022 initiatives from **Poland** and **Slovakia** provide good examples. The Polish #OznaczamReklamy, by the Office of Competition and Consumer Protection, provides recommendations regarding the labelling of advertisements in social media, including for separating advertising from opinions or correct marking of advertising cooperation. The recommendations were accompanied by an educational campaign and advice for users on how to avoid falling into marketing traps and how to make informed consumer choices. On the other hand, IAB Slovakia with the Association of Digital Marketing Agencies released a Code of Influencer Marketing which requires any paid collaboration to be duly endorsed in order to avoid confusion between the influencer's original and promotional content. The Code also highlights unwanted advertising practices, for example fake reviews, unsubstantiated health claims or abuse of children's trust.

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## Chapter IV - Participation in the digital public space

Besides recalling the right to freedom of expression and information as well as freedom of assembly and of association in the digital environment, the Declaration includes a number of principles and commitments on access to a trustworthy, diverse and multilingual digital environment, with a view to contributing to a pluralistic public debate and effective and non-discriminatory participation in democracy. It notably highlights the role of online platforms in mitigating the risks stemming from the use of their services in relation to disinformation, which is now also object of a legal obligation for VLOPs and VLOSEs under the Digital Services Act. The latter platforms and search engines are indeed required to assess and mitigate the risks their services or systems might pose to electoral processes or civic integrity. Such a commitment is closely linked with the general objective of the digital decade to promote a digital environment that fosters democratic life, is human-centred and fully respects fundamental rights.

According to the 2024 Eurobarometer[164], about **six in ten respondents think that the freedom of expression and information online**, e.g., via online platforms, social networks or

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[161] https://cms-lawnow.com/en/ealerts/2022/12/czech-republic-issues-new-comprehensive-obligations-for-consumer-protection.

[162] https://www.irishstatutebook.ie/eli/2022/act/37/enacted/en/html.

[163] Loi n° 2024-449 du 21 mai 2024 visant à sécuriser et à réguler l'espace numérique. https://www.economie.gouv.fr/actualites/numerique-loi-protection-citoyens-entreprises-internet.

[164] Special Eurobarometer 551 'The Digital Decade' 2024: https://digital-strategy.ec.europa.eu/en/news-redirect/833351.

search engines, **is well protected in their country** (61%, a 1 percentage point increase over the last year), as well as the right to freedom of assembly and of association in the digital environment (59%, a 1 percent decrease compared to last year). **Over half of Europeans (53%) believe that they have access to a trustworthy, diverse and multilingual digital environment, including more diverse content, less disinformation, and less illegal content** (an increase of 1 percentage point over last year). Worryingly, over one third (35%) of Europeans thinks the opposite is true (an increase of 3 percentage points over last year), especially citizens from Greece (45%), the Netherlands and Sweden (43%), Romania, Spain and Germany (42%).

The 'Democracy' Flash Eurobarometer[165] from December 2023 also revealed that 'having access to accurate information to make an informed choice' is the most cited aspect by citizens to guarantee 'free and fair elections' (51%) (followed by 'the electoral administration being independent and impartial', at 47%).

**EU action**

The EU committed to continue **safeguarding all fundamental rights online, notably the freedom of expression and information, including media freedom and pluralism**. *(15a)* In April 2024, the co-legislators adopted the European Media Freedom Act (EMFA). The EMFA puts in place a new set of rules to protect media pluralism and independence in the EU. In particular, the EMFA aims to: protect editorial independence; protect journalistic sources, including against the use of spyware; ensure the independent functioning of public service media; enhance transparency of media ownership; safeguard media against unjustified online content removal by very large online platforms; introduce a right of customisation[166] of the media offering on devices and interfaces; enhance transparency in state advertising for media service providers and online platforms; ensure Member States provide an assessment of the impact of key media market concentrations on media pluralism and editorial independence; and foster transparency in audience measurement for media service providers and advertisers.

In the meantime, the Commission continued to scrutinise the implementation of the Audiovisual Media Services Directive[167] as well as the analyses the situation regarding media freedom and pluralism in Member States in its July 2023 Rule of Law Report. In May 2024, the Commission published a study on the application by Member States of the EU 2021 Recommendation on the safety of journalists, which showed that EU Member States are taking some steps towards protection, safety and empowerment of journalists.

The EU and Member States committed in the Declaration to supporting the development and best use of **digital technologies to stimulate people's engagement and democratic participation**. *(15b)*[168] In December 2023, the Commission adopted a compendium of e-voting and other ICT practices, as part of the EU Citizenship Package. The Commission

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[165] Flash Eurobarometer 522 on 'Democracy' 2023, https://europa.eu/eurobarometer/surveys/detail/2966.

[166] Users will have a right to easily change the configuration, including default settings, of any device or user interface controlling or managing access to and the use of media services providing programmes in order to customise the media offering in accordance with their interests or preferences in compliance with Union law.

[167] In January 2024, the Commission published a Staff Working Document reporting on the implementation of the Audiovisual Media Services Directive for the period 2019-2022 and launched a study (Q2 2024) on a legal analysis on the transposition of the Directive in all 27 Member States.

[168] No relevant action reported by Member States on this particular commitment.

invites Member States to build in necessary safeguards to ensure free, fair and resilient elections that fully uphold democratic standards and fundamental rights, when implementing e-voting methods and ICT in elections.

In addition, the EU Citizenship Package includes a guide of good electoral practices in Member States, addressing the participation of citizens with disabilities in the electoral process, including via digital formats. Furthermore, the Commission Recommendation on promoting the engagement and effective participation of citizens and civil society organisations in public policy-making processes from December 2023 recommends Member States to enhance participatory and deliberative exercises in the digital public space, by exploring the use of new technologies that are easily accessible to citizens.

**The EU is also taking measures to tackle illegal and harmful content online**, in full respect for fundamental rights, including the right to freedom of expression and information. Next to specific measures outlined in EU legislation such as the Terrorist Content Online Regulation or the recently adopted EU Directive on combating violence against women and domestic violence which criminalises the most widespread forms of cyberviolence against women, **the EU is implementing horizontal rules to tackle illegal content through the Digital Services Act (DSA)** (*15c*). In August 2023, the DSA became applicable for the first very large online platforms and search engines designated by the Commission, requiring them to adapt their systems, resources, and processes for compliance, and to set up an independent system of compliance. They also had to complete their first annual risk assessment exercise to examine risks such as how illegal content might be disseminated through their service, how their services might pose a risk to fundamental rights, civic discourse, and public health, amongst others. The Commission carefully monitors the application of these obligations. The Commission has opened formal proceedings against a number of companies to investigate their compliance with the DSA e.g., X (formerly known as Twitter), Meta, TikTok.[169]

Since 17 February 2024, all online intermediaries in the EU have to comply with the DSA's general obligations on transparency, countering illegal content and goods, the protection of minors, and upholding users' rights. Such online intermediaries include hosting services, cloud storage services, domain name registers, among others. By this date, Member States had to appoint a Digital Services Coordinator, an authority to supervise and enforce the DSA for platforms established on their territory. In April 2024, the Commission decided to open infringement proceedings against six Member States which had not designated and/or empowered them. The Digital Services Coordinator is the first point of contact for citizens and businesses to resolve complaints related to online platforms.

In December 2023, the Commission and the High Representative for Foreign Affairs and Security Policy adopted a Joint Communication entitled "No place for hate: a Europe united against hatred". The Communication aims to step up EU efforts to fight hatred in all its forms, including further combating hate speech online through an upgrade of the Code of conduct countering illegal hate speech agreed with major online platforms.

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[169] For instance, the proceedings regarding X focus on X compliance with the DSA obligations related to countering the dissemination of illegal content in the EU, the effectiveness of measures taken to combat information manipulation on the platform, the measures taken by X to increase the transparency of its platform. More information on enforcement with regards to VLOPs/VLOSEs is available at: https://digital-strategy.ec.europa.eu/en/policies/dsa-enforcement.

**The DSA also aims to tackle online content that is harmful, but not necessarily illegal, such as disinformation and information manipulation, harassment and gender-based violence** (*15d*). The DSA aims to provide more accountability for the role that online platforms have in the modern media and societal environment. Through new rules around how platforms moderate content, as well as on advertising, algorithmic processes and risk mitigation, the **DSA aims to ensure that platforms**, and in particular the very large ones, **are more accountable and assume their responsibility for the actions they take and the systemic risks they pose**, including on disinformation and manipulation of electoral processes. Platforms must also mitigate against risks such as disinformation or election manipulation, cyber violence against women, or harms to minors online.

With regard to **gender-based violence**, very large online platforms and search engines must prevent abuse of their systems by taking risk-based action, including oversight through independent audits of their risk management measures. The May 2024 [Directive on combating violence against women and domestic violence](#) also strengthens the ability to tackle online gender-based violence by providing definitions of the most widespread forms of cyberviolence against women.[170] The Directive also imposes the obligation to promptly remove, or disable access to harmful content, in line with the rights and obligations under the DSA. Member States must transpose this Directive by 14 June 2027.

The Digital Services Act fosters a co-regulatory framework, together with the updated [Code of Practice on Disinformation](#) and the [Commission Guidance](#), as announced in the European Democracy Action Plan. The Code, which was majorly revised in 2022, contains a broad range of commitments from major online platforms and other players to fight **disinformation** decisively – 44 commitments and 128 measures to implement them, in various areas, such as demonetisation, addressing manipulative behaviours, user empowerment or factchecking. A substantial number and great variety of new signatories – 44 to date – have signed the Code, including major online platforms (Google, Meta, Microsoft, and TikTok). In 2023, signatories submitted the first full sets of reports, delivering detailed data at Member State level on the implementation of their commitments. The data gives important insights on the safeguarding of fundamental rights. For example, the reports contain detailed accounts of the volumes of appeals launched by users against enforcement actions by major online platforms and their success rate, as well as information on how signatories are developing solutions to tackle disinformation generated through artificial intelligence[171]. The signatories furthermore began regular exchanges on mitigating disinformation threats stemming from generative AI and worked on shared efforts to safeguard the integrity of the 2024 European elections.

The EU is also funding the [European Digital Media Observatory](#) and its national and regional hubs, which support the creation of a cross-border and multidisciplinary community of independent fact-checkers and academic researchers that will collaborate to detect, analyse and expose potential disinformation threats and raise media and information literacy. In 2023, six new EDMO Hubs became operational, expanding its network to cover all 27 EU Member States. Furthermore, EDMO continued to publish monthly updates about the changing disinformation situation in Europe, continued its cooperation on countering disinformation

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[170] These forms include the non-consensual sharing of, or threatening to share, intimate images, including sexual deepnudes, cyberstalking, cyberharassment, including doxing, and cyber incitement to hatred or violence based on gender.

[171] All signatory reports can be accessed on the Code's Transparency Centre website: https://disinfocode.eu/

concerning the Russian invasion of Ukraine, and created two additional task forces to fight disinformation surrounding the Israel-Hamas conflict and on the 2024 European elections.

With regards to supporting effective access to digital content reflecting the **cultural and linguistic diversity** in the EU *(15e),* the set of language technologies, including eTranslation, available free of charge to public administrations, NGOs and SMEs across the EU, supports multilingual online information in practice, and is widely used in Commission online tools.[172] Under the umbrella of the EU Work Plan for Culture, the Commission launched in 2024 a study on cultural diversity and discoverability of diverse cultural content in the digital environment with a view to investigate the state of play and the impact of algorithmic recommendations on exposure to cultural and linguistic diversity in a set of cultural and creative sectors[173].

Regarding the commitment to **empower individuals to make free choices and limiting the exploitation of vulnerabilities and biases, namely through targeted advertising** *(15f),* the March 2024 [Regulation on the transparency and targeting of political advertising](#) will make it easier for citizens to recognise political advertisements, understand who is behind them and know whether they have received a targeted advertisement, so that they are better placed to make informed choices. It will also ensure that political advertising takes place in full respect of the right to privacy and that the freedom of opinion and freedom of speech are protected. The new Regulation has entered into force, most of its provisions will apply from late 2025.

**Member States action**

Alongside important efforts at EU level, Member States have also implemented initiatives to protect and promote a **trustworthy, diverse and multilingual digital environment** through various national legislation[174] and in some cases even embedded freedom of expression and information into national strategies *(15a,15e).* For example, Bulgaria embedded freedom of expression into its *National Development Programme 2030*[175]*,* adopted in 2020*,* where the main action points for achieving media freedom and pluralism are defined within a dedicated pillar. Similarly, in 2021 Portugal adopted the *Charter on Human Rights in the Digital Age*[176] which states that the rights, liberties and human rights safeguarded offline are also applicable online. It establishes a set of rights including the freedom of speech and creation online, rights of assembly and association, and participation in a digital environment.

Facilitating freedom of expression while safeguarding citizens against **illegal content and disinformation** seems to be addressed in many Member States through legislative acts *(15c, 15d).* Many Member States have adopted laws against harassment, sexual and other forms of violence. Member States are also implementing the DSA by appointing Digital Services Coordinators, that will contribute to DSA enforcement.

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[172] Including TED, N-Lex, ODR, EURES and SOLV-IT.

[173] Discoverability of Diverse European Cultural Content in the Digital Environment, EAC/2023/OP/0004. Results expected in the second half of 2025.

[174] For example, Austria, Belgium, Bulgaria, Croatia, Cyprus, Denmark, Finland, France, Hungary, Ireland, Latvia, Luxembourg, Portugal and Spain.

[175] National Development Programme 2030. https://www.minfin.bg/en/1394.

[176] Charter on Human Rights in the Digital Age, https://www.paxlegal.pt/xms/files/LEGAL_FLASH_The_Portuguese_Charter_for_Human_Rights_in_the_Digital_Age.pdf.

Due to the difficulty of tackling harmful content itself, **most Member States' efforts rely on improving citizens' media literacy and critical thinking** through various educational activities. One of the examples include the *Baltic Centre for Media Excellence*[177] created in Latvia in 2015, a hub focusing on the promotion of smart journalism in the Baltics, delivering media training to independent media, gathering intelligence on regional media trends and skills, as well as research media audiences with a focus on those most vulnerable to propaganda messages. Meanwhile in Croatia, a part of the annual Safer Internet Day 2023 organised in schools, students had the opportunity to learn how to recognise disinformation in online media.[178]

Important actors in the field are also research institutes which gather important data in the context of digital media and disinformation, identify trends, provide insights to combat disinformation and facilitate free and diverse media. The EDMO has supported Member States in detecting and analysing disinformation, training professionals and citizens as well as providing support to authorities in monitoring online platforms. There are currently 14 operational hubs active in all Member States and Norway.[179]

As regards **targeted advertising and preventing exploitation of vulnerabilities** *(15f)*, besides specific cases dealt with by Member State's data protection or consumer protection authorities, some Member States have issued guidelines to clarify how relevant legislation should be interpreted in relation to online advertising, including the 2022 guidelines by the Polish consumer protection authority regarding labelling of advertisements in social media[180]. Guidelines were also reported by Sweden[181], Italy[182] and Cyprus[183]. Some Member States, including Bulgaria[184] and Slovakia[185], also reported encouraging the establishment of forums for self-regulation and the development of codes of conduct. To aid in educating consumers, in 2021 an NGO in the Netherlands has prepared a course on manipulation[186], while in Denmark, a free teaching material has been developed for young people to gain skills in understanding what underlies commercial communication on social media.[187]

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[177] Baltic Centre for Media Excellence, https://bcme.eu/en/home-page.

[178] Safer Internet Day 2023 Croatia,
https://mrosp.gov.hr/UserDocsImages/dokumenti/Socijalna%20politika/Dokumenti/Nacionalni%20plan%20za%20prava%20djece%20u%20Republici%20Hrvatskoj%20za%20razdoblje%20od%202022.%20do%202026.%20godine.pdf.

[179] For more details see: https://edmo.eu/about-us/edmo-hubs/ . While independent hubs were established in France, Hungary, Ireland, and Italy, the majority are multinational including for instance BECID: Baltic engagement centre for combating disinformation disorders (Estonia, Latvia, Lithuania), CEDMO: Central European digital media observatory (Czech Republic, Poland, Slovakia) or MedDMO: Mediterranean Digital Media Observatory (Cyprus, Greece and Malta).

[180] https://mfinante.gov.ro/documents/35673/314940/L158_2008.pdf.

[181] https://www.konsumentverket.se/for-foretag/marknadsforing/marknadsforing-i-sociala-medier/.

[182] https://www.garanteprivacy.it/home/docweb/-/docweb-display/docweb/3118884.

[183] 2017 Cypriot Data Protection authority Guidelines on political advertisements.
https://www.dataprotection.gov.cy/dataprotection/dataprotection.nsf/news02_exp_gr/news02_exp_gr?OpenDocument&Start=1&Count=1000&Expand=7.

[184] https://www.nss-bg.org/en/about.

[185] https://www.mondaq.com/social-media/1235022/brand-new-code-of-influencer-marketing-released-in-slovakia.

[186] https://www.kortecursusmanipulatie.nl/.

[187] https://www.kfst.dk/socialstar/.

## Chapter V - Safety, security and empowerment

### A protected, safe and secure digital environment

In keeping with the objective of protection against cyberattacks included in the Digital Decade, the signatories of the Declaration committed, notably, to take (further) measures to promote traceable and safe products on the Digital Single Market, and to protect people, businesses and public institutions against cybersecurity risks and cybercrime, including via cybersecurity requirements for connected products placed on the single market.

According to the 2024 Eurobarometer survey[188], **a majority of Europeans (55%) consider that the principle of access to safe and privacy-friendly digital technologies is well protected** in their country (same as last year), especially in Finland (75%). This is the same proportion as last year. Over one third (34%) is of the opposite view however, an increase of 2 percentage points over last year.

### EU action

The General Product Safety Regulation (GPSR) was adopted in May 2023. The Regulation will replace the current General Product Safety Directive from December 2024. It aims to address the product safety challenges of emerging technologies, including use of artificial intelligence and connected devices, and to establish clear obligations for online marketplaces, which consumers increasingly use for their online purchases. The text lays down requirements for producers, importers and distributors. Producers and importers are required to place only

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[188] Special Eurobarometer 551 'The Digital Decade' 2024: https://digital-strategy.ec.europa.eu/en/news-redirect/833351.

safe products on the market. Distributors are required to act with due care to not supply products that they know, or should have known, do not comply with the requirements. Producers, importers and distributors are required to withdraw products placed on the market if they turn out to be dangerous, or, as a last resort, recall them from the consumers who have already bought them. (*16a*)

Next to its provisions increasing the transparency about traders ('traceability of traders'), the Digital Services Act also provides that national Digital Services Coordinators (the national authorities in charge of supervising and enforcing the DSA in Member States) appoint known experts ('trusted flaggers'). Platforms have to cooperate with these experts who can report illegal content on online platforms.

Moreover, in the context of the Product Safety Pledge+, a framework facilitated by the Commission[189], major online marketplaces committed to voluntary cooperation mechanisms beyond the requirements of the GPSR and the DSA and enhances further the safety of EU consumers when buying online. This includes a strengthened notice and takedown mechanism, proactive monitoring of recall sites and additional commitments linked to recalls, transparency or trader education.

The Network and Information Security Directive as amended (NIS 2), which entered into force in January 2023, raised significantly the level of ambition on cybersecurity, through a wider scope, clearer rules and stronger supervision tools. The NIS 2 Directive strengthens cybersecurity requirements for entities in critical and highly critical sectors, streamlines reporting obligations for these entities, introduces more stringent supervisory measures for national authorities, as well as stricter enforcement requirements, and aims at harmonising sanctions regimes across Member States. It will help increase information sharing and cooperation on cyber crisis management at a national and EU level. Member States have until 17 October 2024 to transpose it. The Commission published guidelines to support national transposition in September 2023.[190] (*16b*)

The Cyber Resilience Act (CRA), politically agreed in November 2023, requires manufacturers of hardware and software products to only make available products with digital elements on the market if they meet specific essential cybersecurity requirements. It requires manufacturers to factor cybersecurity into the design and development of products with digital elements and to provide timely security updates during the support period of such products.

In March 2024, political agreement was reached on the Cyber Solidarity Act. The new Regulation establishes EU capabilities to make Europe more resilient and reactive in front of cyber threats, while strengthening cooperation mechanisms. It mainly aims to support detection and awareness of significant or large-scale cybersecurity threats and incidents; foster preparedness and protect critical entities and essential services, such as hospital and public utilities; strengthen solidarity at EU level, concerted crisis management and response

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[189] See also under Chapter III above.

[190] The Commission had also proposed a Regulation puts in place a framework for governance, risk management and control across EU entities (EUIBAs), with a new Interinstitutional Cybersecurity Board to monitor its implementations. The Regulation, adopted in December 2023, notably provides that CERT-EU becomes the Cybersecurity service for EUIBAs and a threat intelligence, information exchange and incident response coordination hub.

capabilities across Member States; and contribute to ensuring a safe and secure digital landscape for citizens and businesses. The Regulation also establishes a 'cyber security alert system' to quickly and effectively detect major cyber threats, and provides for the creation of a cybersecurity emergency mechanism to increase preparedness and enhance incident response capabilities in the EU.[191]

The EU has taken a proactive approach to addressing cybersecurity risks in emerging technologies to ensure economic security and strategic autonomy. One illustration of this has been the adoption and implementation of the EU 5G Cybersecurity Toolbox. The progress and remaining shortcomings in the implementation of the 5G Toolbox by Member States have been detailed in the NIS Cooperation Group Progress Report of June 2023.[192] In a Communication of June 2023, the Commission took stock of the implementation of the EU toolbox on 5G cybersecurity and called on Member States, inter alia, to impose restrictions on high-risk suppliers without delay. In addition, the Commission also assessed two specific 5G suppliers as high-risk and committed to avoid exposure to these two suppliers in its corporate communications networks and relevant EU funding programmes and instruments.[193]

The Defence of Democracy Communication of December 2023 reports on the Commission's cooperation with the EEAS to help build **resilience against and prevent, deter and respond to foreign information manipulation and interference (FIMI) on disinformation** (*16c*). In order to promote, inter alia, the integrity and fair campaigning during elections, the Commission also adopted in December 2023, a Recommendation on inclusive and resilient electoral processes in the European Union and enhancing the European nature and efficient conduct of the elections to the European Parliament, which put forward a series of measures to protect election-related information from manipulation and disinformation.

**Member States action**

With the aim of **ensuring traceability of products and guaranteeing that products are safe and compliant with EU legislation** *(16a),* Member States use mainly legislative measures, focusing on transposing the General Product Safety Regulation and instituting laws that govern the activities of the authorities involved in customs controls and market surveillance authorities.[194] Member States have also set up platforms that allow for the monitoring of products sold online, such as the Danish *Produkter.dk[195]* website created in 2021 by the Danish Safety Technology Agency.

In the area of **cybersecurity** (*16b, 16c)*, all Member States have established *CSIRST*[196] and *CERT*[197], which monitor and act upon cybersecurity risks and incident, and implemented National Cybersecurity Strategies, as required by EU law. These strategies provide details on

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[191] Note that the European Cybersecurity Competence Centre (ECCC), which supports innovation and industrial policy in cybersecurity, develops and coordinates EU cybersecurity projects funded by e.g., DEP and HE, adopted its first strategic agenda for EU investment in cybersecurity in March 2023.

[192] NIS Cooperation Group, Second report on Member States' Progress in implementing the EU Toolbox on 5G Cybersecurity, 2023, https://digital-strategy.ec.europa.eu/en/library/second-report-member-states-progress-implementing-eu-toolbox-5g-cybersecurity.

[193] Commission Communication 'Implementation of the 5G cybersecurity Toolbox', C(2023) 4049 final.

[194] For example, the Consumer Protection Act in Bulgaria, amended in 2023. https://lex.bg/laws/ldoc/2135513678.

[195] Produkter.dk, https://produkter.dk/om.

[196] Computer Security Incident Response Teams.

[197] Computer Emergency Response Team.

the cybersecurity challenges and risks faced by the Member States and outline measures to enhance their resilience, societal awareness, and cooperation to guard against threats. Several Member States have also implemented **public awareness campaigns about cybercrimes and online security**. These involve initiatives launched by public authorities, such as the one in Luxembourg[198], and by private compagnies, for instance those organised yearly by the Maltese *National Cybersecurity Centre*[199] or by the Swedish police[200]. Some measures are directed at increasing the awareness of public officials, for instance in Estonia[201] and Portugal[202]. Several online portals also provide advice and recommendations to the general public on how to navigate the online world and manage cyber risks[203]. Furthermore, the *Digital Trust Centre*[204] in the Netherlands seeks to make enterprises more resilient against cybersecurity threats, and programmes, such as the 2022 *RETECH Ciberseguridad*[205] from Spain, and *Women Cyber Force[206]* launched in 2021 in Luxembourg, seek to attract and cultivate talent in the cybersecurity sector.

Member States have also established authorities, centres and task forces seeking to **monitor, analyse and respond to online threats** (*16c*), such as cyberspace monitoring by the Estonian *Information System Authority*[207] and Hungary's *CyberShield Program*[208] which bring together financial, law enforcement and regulatory authorities to combat online scams, enhance digital security awareness, and enhance resilience against cyber threats. Furthermore, the French 2023 law[209] establishes a cyber training school within the Ministry of the Interior which deploys 1500 'cyber-patrol' officers, tasked with identifying online scams, trafficking rings, and online threats to minors.

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**Best practice**

In order to promote an open, free and secure digital space, **the Netherlands** has adopted in 2023 its [International Cyber Strategy 2023-2028](#). This inter-ministerial strategy aims to combat cyber threats posed by states and criminals, reinforce democratic and human rights principles online and maintain a globally interconnected open, free and secure internet.

**Denmark** provides a good example with the [D-mærket initiative](#), a special labelling scheme for IT security and responsible data use. This voluntary scheme clarifies which companies demonstrate digital responsibility and thus gives both Danish and foreign customers the opportunity to choose a responsible supplier who has cyber security under control. The D-

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[198] 'Keep your space safe', 2023, BEE SECURE initiative. https://www.bee-secure.lu/de/kampagne/keep-your-space-safe/.

[199] National Cybersecurity Centre, https://ncc-mita.gov.mt/.

[200] https://www.msb.se/sv/amnesomraden/informationssakerhet-cybersakerhet-och-sakra-kommunikationer/arbeta-systematiskt-informationssakerhet-och-cybersakerhet/informationssakerhetsmanaden/tank-sakert/.

[201] Kyber Test, https://www.kybertest.ee/.

[202] https://www.cncs.gov.pt/en/c-academy/.

[203] Estonia, Malta, Portugal, Lithuania, Luxembourg.

[204] Digital Trust Centre, created by the Dutch Ministry of Economic Affairs and Climate Policy, 2018. https://www.digitaltrustcenter.nl/.

[205] RETECH Ciberseguridad, https://portal.mineco.gob.es/es-es/comunicacion/Paginas/jornada-RETECH.aspx.

[206] Women Cyber Force, https://www.womencyberforce.lu/.

[207] Information System Authority, https://www.ria.ee/en/cyber-security/cyberspace-analysis-and-prevention/situation-cyberspace.

[208] CyberShield Program, https://bbj.hu/economy/statistics/analysis/hungarys-cybershield-program-expands-to-better-withstand-digital-crime.

[209] Law No. 2023-22. https://www.legifrance.gouv.fr/dossierlegislatif/JORFDOLE000046266613/.

mærket aims at building transparency and trust. As a result, market forces can help to improve respect for digital and human rights. The scheme sets out strict requirements on participating companies.

**Privacy and individual control over data**

Data protection and privacy are key fundamental rights in the digital age. They are also enabling the protection of other fundamental rights that can be affected by unlawful surveillance, such as human dignity and freedom of expression. The EU and Member States have undertaken in the Declaration to ensure effective control of personal and non-personal data in line with EU data protection rules and relevant rules. They have also committed to effectively protect communications from unauthorised third-party access, prohibiting unlawful identification as well as unlawful retention of activity records. The EU and Member States also undertook to effectively ensure the possibility for individuals to easily move their personal and non-personal data between different digital services in line with portability rights.

According to the 2024 Eurobarometer survey[210]**, only a slight majority of Europeans consider that their privacy online, i.e., respect for the confidentiality of communications and information on devices, is well protected** (51%, like last year), with the best results in Finland (69%) and Poland (68%). **Worryingly, almost 4 in 10 Europeans (39%) believe that their privacy online is not well protected**, an increase of 3 percentage points compared to last year, with more than a half of citizens in Greece (51%).

Even worse, **getting control over one's own data, i.e., how it is used online and with whom it is shared, is not well protected according to more than four in ten of Europeans (44%, compared to 39% one year ago)**, and well protected according to less than half of citizens (47%, a decrease of 2 percentage points compared to last year). Only four out of ten Europeans (41%, from 40% last year) believe that they are getting control of one's digital legacy, for instance deciding what happens with personal accounts and information after one's death.

**EU action**

The Data Act, which entered into force in January 2024 and will start to apply from September 2025, gives individuals or businesses that own, lease or rent connected products **greater control over the data they generate**, while maintaining incentives for those who invest in data technologies. A data holder, typically the company that makes the connected product or that provides a related service, must have a contract with the user defining the rights regarding the access, use and sharing of the data that is generated by the connected product or related service. To the extent personal data are concerned the Data Act complements the rights to access and portability under the General Data Protection Regulation (GDPR). Indeed, the GDPR lays down rights and obligations to facilitate natural persons' control of their own personal data: the obligation to process personal data lawfully

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[210] Special Eurobarometer 551 'The Digital Decade' 2024: https://digital-strategy.ec.europa.eu/en/news-redirect/833351.

and in a transparent manner, rights to access and port personal data, as well as a right to seek review by an independent supervisory authority and courts.[211][212] (*19a*).

In July 2023, the Commission proposed new rules to streamline cooperation between data protection authorities (DPAs) when enforcing the GDPR in cross-border cases. The harmonisation of these procedural aspects will support the timely completion of investigations and the delivery of a swift remedies for individuals. The proposal lays down detailed rules concerning cross-border complaints, the involvement of the complainant in the procedure, the due process rights of parties under investigation (controllers and processors), and cooperation between data protection supervisory authorities. The proposal provides the parties under investigation with the right to be heard at key stages in the procedure, including during dispute resolution by the European Data Protection Board. A number of research projects funded by Horizon Europe are ongoing on privacy-preserving technologies and compliance.[213]

On **portability of data**, according to the Data Governance Act, which applies since September 2023, providers of data intermediation services can assist individuals in exercising their rights under the GDPR[214], in particular the right of access to their own data and the right to data portability. The Data Act provides for the right to 'access and port' both personal and non-personal data collected or generated by connected devices. Additionally, it enables switching between data processing services. Note as well the ongoing Horizon Europe R&I actions on personal data platforms and commercial/industrial data platforms. (*19b*)

The ePrivacy Directive already provides for some protection of the **confidentiality of communications** and related traffic data, as well as the user's terminal equipment (e.g. PC, smartphones). Concretely, it prohibits listening, tapping, storage or other kinds of interception or surveillance of communications and the related traffic data by persons other than users, without the consent of the users concerned, except when legally authorised to do so in accordance with the Directive. In addition, the ePrivacy Directive protects information stored in the terminal equipment. Moreover, traffic data must be erased or made anonymous when it is no longer needed for the transmission of a communication. The proposed ePrivacy Regulation aims to strengthen and clarify such protections. The Cyber Resilience Act, which sets cybersecurity requirements for hardware and software made available on the European market, raises the level of security of smartphones and other digital products and requires manufacturers to effectively address vulnerabilities, which will make it more **difficult for third parties to access communications** without authorisation. (*19c, 19d*)

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[211] The Data Protection Law Enforcement Directive (LED) lays down specific rules relating to the protection of natural persons with regard to the processing of personal data by law-enforcement authorities for the purposes of the prevention, investigation, detection or prosecution of criminal offences or the execution of criminal penalties, including the safeguarding against and the prevention of threats to public security.

[212] On access to personal data, note the Commission Implementing Regulation (EU) 2023/1162 on interoperability requirements and non-discriminatory and transparent procedures for access to electricity metering and consumption data.

[213] Call HORIZON-CL4-2021-DATA-01-01, more info including the projects funded is available at: https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2021-data-01-01.

[214] Article 20 of the GDPR provides that individuals have the right to receive the personal data concerning him or her under certain conditions in a structured, commonly used and machine-readable format and have the right to transmit those data to another controller without hindrance from the controller to which the personal data have been provided.

**Member States action**

In order to ensure effective control of citizens of their personal and non-personal data (*19a*), allow them to easily move their data between different digital services in line with portability rights (*19b*) and protect their electronic communications from unauthorised third party access (*19c*) and unlawful identification and data retention (*19d*), all Member States have implemented the GDPR and the ePrivacy and NIS II directives and monitor compliance.

Educational programmes, often co-funded by the EU, have also been implemented by Member States **to educate citizens on their rights concerning data protection**. For instance, the Czech Educational programme[215] which includes courses for elementary and school children on personal data protection and the *Vi guidar dig*[216] in Sweden and *Guidelines to foster data protection and privacy online*[217] in Spain. Denmark also launched an information campaign *Everyone has secrets*[218].

**Some states have also implemented technological solutions**, such as Estonia (*below*) or Poland, which provides since 2023 a free online tool for automated detection of personal and sensitive data in documents and its anonymization.[219] As regards **network security**, the national cyber security strategies, required in all Member States, **set out measures to** enhance the resilience of Member States against cyber threats, including measures to raise awareness, promote cooperation between public and private sector, and increase the readiness of citizens, companies and public administrations to prevent and handle threats. Efforts also appear to have been placed on improving digital infrastructure to ensure security and efficiency in the exchange of classified information. For instance, Sweden's *Secure Digital Communication*[220] established in 2021, allows for secure and efficient exchange of classified information between businesses that are fully or partially publicly funded.

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**Best practice**

In **Belgium**, my Data GDPR platform provides information to citizens on the treatment of their personal data by public and federal institutions. As of 2023, Belgian citizens can see who accessed their personal data held by authorities, and for what reason. The website is developed by the federal government in light of the principles of the GDPR and, more particularly, the principle of transparency (art. 12). The information contained on this site comes from the registers of processing activities that each public institution must keep in its capacity as data controller (art. 30 GDPR).

**Estonia** has implemented a Data tracker, launched in 2017 by the Information System Authority (RIA), which allows citizens to access a clear overview of the operations being performed with their data. The Data Tracker is designed to interface with public sector information systems that store and process personal data in their databases and monitor the traffic in and out of the database. The tool helps citizens with establishing transparency over

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[215] Czech Educational programme, launched in 2007 by the Office for Personal Data Protection.

[216] Vi guidar dig, https://www.imy.se/privatperson/dataskydd/vi-guidar-dig/.

[217] Guidelines to foster data protection and privacy online, Spanish Agency for the Protection of Data, 2016. A compendium of guides which provide information on how to protect data according to different sectoral or privacy needs.

[218] Everyone has secrets, https://www.datatilsynet.dk/borger/hemmeligheder.

[219] https://www.nask.pl/pl/dzialalnosc/anonimizacja/5168,Nowa-usluga-anonimizacji-dokumentow.html.

[220] Secure Digital Communication, https://www.regeringen.se/regeringsuppdrag/2021/12/uppdrag-att-tillhandahalla-infrastruktur-for-saker-digital-kommunikation-i-offentlig-sektor/.

the use of data, increases the awareness of how data is used online, and clarifies requests authorities receive concerning the use of citizens' personal data.

## Protection and empowerment of children and young people in the digital environment

The Declaration provides that children and young people should be empowered to make safe and informed choices and express their creativity in the digital environment, have access to age-appropriate materials and services, while being protected from crimes committed via or facilitated through digital technologies. It includes several commitments in this respect, from providing education to navigating the digital environment, through protecting children and young people from harmful and illegal content, exploitation, manipulation and abuse online, to involving them in the development or digital policies that concern them.

Protection of children and young people online is a topic that Europeans remain concerned about, as appears from the 2024 Eurobarometer survey[221]. **Overall, a majority (53%) are worried about the safety of children online in their country, a significant increase compared to 43% last year**, mostly in Sweden (74%), Denmark (67%), the Netherlands (63%), Finland, Slovenia and Greece (62%), Spain (61%), and in Portugal (60%). **Only 39% of Europeans (compared to 45% last year) consider that their country is ensuring safe digital environment and content for children and young people**, with most optimistic citizens being in Poland and Hungary (59%).

### EU action

The EU committed to provide opportunities to all children and young people to acquire the necessary **skills and competences**, including media literacy and critical thinking, in order to navigate and engage in the digital environment actively, safely and to make informed choices (*22a*). Under the [Better internet for kids strategy](#) (BIK+), the Commission is aiming that children acquire the necessary skills and competences to make sound choices and express themselves in the online environment safely and responsibly. Thanks to the EU co-funded [network of Safer Internet Centres](#) in Member States, the Commission raises awareness on online safety, providing resources in all EU languages and trainings across the EU.

Throughout 2023, the network of Safer Internet Centres and the BIK platform reached over 30 million EU citizens, providing them with close to 1,500 new resources. Network resources cover topics such as algorithms, artificial intelligence, promoting respect and empathy in online communities, democracy online, violence in the digital environment, digital literacy, and the lure of quick money online, alongside many others. On Safer Internet Day 2023, over 28,000 schools were reached and nearly 4,500 other organisations were involved across Europe alone. Many more were reached across the globe, with more than 180 countries and territories participating in celebrations in some way. To mark Safer Internet Day 2024, the Commission published in all EU languages a public-friendly [booklet](#) on the DSA provisions on protection of minors.

In March 2024, the pilot phase of the media literacy campaign [MediaSmartOnline](#) kicked-off in Ireland, Poland and Czechia. This initiative aims to test out a Europe-wide media literacy

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[221] Special Eurobarometer 551 'The Digital Decade' 2024: https://digital-strategy.ec.europa.eu/en/news-redirect/833351.

awareness-raising campaign, in collaboration with the network of Safer Internet Centres. In 2023, The Safer Internet Forum (SIF) - the key annual international multi-stakeholder conference under BIK, youth-led – had focused on Empowering YOUth with skills for the Digital Decade, in line with the European Year of Skills.

**With the Digital Services Act (DSA) now in application, the EU promotes positive experiences for children and young people in an age-appropriate and safe digital environment** *(22b)*. Online platforms are required to ensure a high level of privacy, safety, and security for minors and are prohibited from displaying advertisements targeted to minors based on profiling.[222][223] Designated Very Large Online Platforms (VLOP) and Very Large Online Search Engines (VLOSE) are required to assess risks to the rights of the child as well as any negative effects that their services might have on the protection of minors and their physical and mental well-being. Designated VLOP and VLOSE are also required to take targeted risk mitigation measures to protect the rights of the child, examples of which include age verification, parental control tools, tools aimed at helping minors signal abuse or obtain support.[224]

In April 2024, the Commission announced at a meeting of the Board of Digital Services Coordinators (DSCs) that it would issue guidelines to assist all providers of online platforms in delivering on the requirements of the DSA to ensure a high-level of safety, security and privacy for minors using their services. This work will involve extensive work with relevant stakeholders, a public consultation on a proposal and the formal consultation of the Board of Digital Services Coordinators.

In February 2024, the Commission launched an investigation into TikTok's compliance with the DSA, including in areas linked to the protection of minors. The investigation, inter alia, deals with potential negative effects stemming from the platform's design, including creating addiction and 'rabbit hole effect', the efficiency of TikTok's age verification tools to prevent access by minors to inappropriate content, and privacy for minors.

The BIK+ Strategy also focuses on **protection of children from harmful and illegal online content**, conduct, contact and risks as young consumers and to improve their well-being online through a safe, age-appropriate digital environment, created in a way that respects children's best interests (*22c*). The Commission is also progressing on **age verification** with a dedicated Task Force (including Member States, European Data Protection Board and European Regulators Group for Audiovisual Media) tasked to develop an EU-wide approach to age verification in the framework of the EU Digital Wallet. The Commission is also working on a request for a standard on age verification.

The Safer Internet Centres provide helplines to support children, young people, their parents and carers with issues they encounter online. In the period from October to December 2023, there were just under 28,000 contacts made to the network which is a significant increase on the previous reporting period.[225] The Centres also run hotlines to report child sexual abuse material online. In 2023, a total of 785,322 content URLs were processed in ICCAM by

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[222] Safer Internet Forum - BIK Portal: www.betterinternetforkids.eu.
[223] Article 28 DSA.
[224] Articles 34 and 35j DSA.
[225] www.betterinternetforkids.eu.

INHOPE hotlines from which 88 per cent were seen for the first time. From all these content URLs, a total of 69 per cent were determined to be illegal and, subsequently, national law enforcement agencies (LEAs) were informed and a notice and takedown was issued to the hosting internet service provider (ISP).[226]

Under the BIK+ strategy, the AdWiseOnline campaign on child and youth consumer protection in digital environment was launched on Safer Internet Day 2024. This evidence-based campaign includes research on manipulative marketing practices in the digital environments conducted by the Ghent University. The research findings are public and can also serve as a valuable resource for stakeholders and policymakers. The campaign is running in cooperation with the network of Safer Internet Centres (SICs) and European Consumer Centres (ECC-Net).

The GDPR recognises that children deserve stronger protection of their personal data as they may be less aware of the risks and their rights. The GDPR lays down conditions applicable to consent in relation to information services that affect children. It also grants a specific right to 'erasure' (right to be forgotten) regarding children's personal data collected from online services and makes clear that processing of personal data must not negatively impact the best interests of the child. The GDPR clarifies that specific protection should be given to the personal data of children, in particular when used for marketing or creating user profiles and to offer services directly to a child. Furthermore, the GDPR requires that children should not be subject to automated decision making and requires controllers to inform children about their rights and communicate to them in an easily understandable way.

Besides the GDPR provisions, processing of the personal data of a child, the DSA now specifically prohibits online platforms from targeting advertisements on minors based on personal data.

The EU also aims to **involve children and young people in the development of digital policies** that concern them *(22e).* [227] Under the BIK+ Strategy, the Commission actively involves children by giving them a say in the digital environment, with more child-led activities to foster innovative and creative safe digital experiences. The 2023 edition of the Safer Internet Forum also provided an opportunity to focus on digital empowerment and active participation of children and young people[228]. *(22d)*

**Member States action**

**Member States are actively implementing commitments related to the protection of children and young people in the digital space**, many of which focus on implementing the objectives from the EU's BIK+ Strategy. The Safer Internet Centres, established in most EU Member States, organize many activities such as events, campaigns, hotlines and helplines.

Many initiatives focus on **media literacy** and enhancing children's and young people's ability to critically evaluate and understand digital content, as well as initiatives focused on **online**

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[226] BIK 2023 report, https://www.betterinternetforkids.eu/practice/awareness/article?id=7184922.

[227] No relevant action reported by Member States on this particular commitment.

[228] The event was organised in a youth-led manner, with a remarkable group of 41 young people from 23 different European countries. Additionally, more than 960 events involving youth participation were organised in Member States throughout 2023.

**safety**, educating children and their parents about potential online threats and how to navigate the digital environment safely *(22a)*. They may also provide resources for reporting breaches of child protection laws. Some examples include the *Safer Internet Centre* in Estonia[229], and the *Jeprotegemonenfant*[230] platform in France. Further initiatives focus on combatting **disinformation and fake news**, such as the *Combating Media Illiteracy: A Digital Handbook*[231] project in Romania Projects usually incorporate elements from multiple categories. *(22c, 22d)*.

Member States also put forward awareness raising campaigns (such as *BEE SECURE*[232] in Luxembourg), and **educational programs**, such as the *European Safe Online Initiative*[233] which informs parents and carers about children's digital media use, empowers them to educate children online and provides them with useful tools to prevent and respond to any risky behaviour. In the past three years, the programme has been adopted by French-speaking Belgium, Greece, Cyprus, Romania and Bulgaria and reached over 5000 parents.

Some Member States also put forward **parental control** tools, which allow parents to set the duration of time spent using different electronic devices, to avoid overexposure of children to screens, in addition to parental content filtering.*(22b)* For instance, the campaign *Parental Control. Protect your children's world*[234] launched in 2023 in Italy, informs parents about the parental control tools available to them to protect their children and the possibility of free activation on all technological devices with Internet access.

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**Best practice**

A joint project by NASK – National Research Institute (**Poland**), Latvian Internet Association (**Latvia**) and Save the Children **Romania**, provides a good example on educating young people against disinformation online. Make it Clear is addressed primarily to young people aged 11-17, but also to parents, teachers and specialists working with children. The aim of the project is to develop information competences in youth, a conscious and critical approach to the content available in the media, particularly in social media. It also aims to broaden the knowledge and raise awareness of teachers about phenomena such as fake news, manipulation techniques and propaganda, which will allow them to develop information skills among their students and to raise the interest of parents in the problem.

In the **Netherlands**, the City of Amsterdam focuses on the impact of the online world on the lives of young people, in areas such as safety and mental health. Amsterdam works with youth organizations to develop a youth-led trend monitor on online developments and phenomena, which allows a quick response to online safety issues. Through digital literacy projects, Amsterdam wants to ensure that young people become more digitally resilient but also safer and creative in discovering the digital world. It also rolled out HackSheild, a game for

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[229] Safer Internet Centre in Estonia, https://www.targaltinternetis.ee/en/.

[230] Jeprotegemonenfant, https://jeprotegemonenfant.gouv.fr/.

[231] Combating Media Illiteracy: A Digital Handbook, https://pjp-eu.coe.int/en/web/charter-edc-hre-pilot-projects/combating-media-illiteracy-a-digital-handbook.

[232] BEE SECURE, launched in 2010. https://www.bee-secure.lu/fr/a-propos/.

[233] European Safe Online Initiative, https://www.betterinternetforkids.eu/practice/articles/article?id=7099907.

[234] Parental Control. Protect your children's world, https://famiglia.governo.it/it/politiche-e-attivita/comunicazione/notizie/parental-control-proteggi-il-mondo-dei-tuoi-figli-avviata-la-campagna-di-comunicazione-istituzionale/.

children between 8 and 12 years old that teaches them how to stay protected from the dangers of the online world, such as cyberbullying.

## Chapter VI - Sustainability

The Declaration promotes digital products and services with a minimum negative impact on the environment and on society, as well as digital solutions with a positive impact on the environment. Moreover, the Declaration provides that access to accurate and easy-to-understand information on environmental impact and energy consumption should be available to everyone. The EU and Member States committed in the Declaration to incentivising sustainable consumer choices and business models and fostering sustainable and responsible corporate behaviour throughout global value chains of digital products and services, including with a view to combating forced labour.

According to the 2024 Eurobarometer survey[235], **half of Europeans (50%), compared to 48% last year, consider that they are getting access to digital products and services that minimise damage to the environment and society** (e.g., products and services that can be repaired or recycled, and which do not involve forced labour), especially in Poland (69%) and Hungary (68%). However, 36 percent (vs. 34% last year) think the opposite, with more than a half of citizens in the Netherlands and Sweden (both 53%) being sceptical.

Similarly, **half of Europeans** (50%, compared to 51% last year) **believe that the principle of getting access to the right information on the environmental impact and energy consumption of digital technologies is well protected** in their country, while a more than a third (37%) considers it is not well protected (an increase of 4 percentage points compared to last year's 33%), including more than half of citizens from Sweden (54%), almost a half in the Netherlands (49%), and 45% of Slovenians.

According to the 2024 Berlin Declaration Monitoring data[236], **Member States have made significant progress** in this regard. In 2023, 72% of Member States have been **assessing and making transparent the energy sources and consumption of digital tools and infrastructures** as well as ways to improve their efficiency, an increase of 7 percentage points since 2022. The monitoring also shows considerable progress (12 percentage points) on **evaluating the environmental impacts of ICT and establishing a strategy aimed at expanding the lifespan of digital equipment**, on which the EU average score was 66% in 2023 compared to 54% in 2022.

### EU action

In order to **support the development and use of sustainable digital technologies that have minimal negative environmental impact** (*24a*), the new [Ecodesign for Sustainable Products Regulation](#) (ESPR), adopted in May 2024, aims to progressively set performance and information requirements for key products placed on the EU market, including ICT products like mobile phones and tablets. The Regulation introduces a 'Digital Product Passport', that is, an easily accessible tag on products that will give instant access to information on product

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[235] Special Eurobarometer 551 'The Digital Decade' 2024: https://digital-strategy.ec.europa.eu/en/news-redirect/833351.

[236] The 2024 report on the monitoring of the Berlin Declaration on Digital Society and Value-Based Digital Government is expected to be released later in 2024.

sustainability. The Digital Product Passport CIRPASS project, funded by Digital Europe Programme, is preparing the ground for the gradual piloting and deployment of the Digital Product Passport.

Note that the Commission has requested standardisation bodies CEN/CENELEC **to develop a number of harmonised standards to support the deployment of the Digital Product Passport**. Deliverables are expected by end of 2025 (*24d*).

The 2023 Energy Efficiency Directive includes an obligation for data centre operators to report to the Commission a set of indicators on **data centres' energy performance**, with an EU-level database collecting and publishing data. The Commission has adopted a first Delegated Act in March 2024, which is the first phase in establishing the common Union scheme and sets out what initial information and key performance indicators are needed from data centres, as well as the first sustainability indicators that will be used for rating of the sustainability of data centres.

According to the 2022 EU Action Plan on Digitalising the Energy System, common EU **indicators for measuring the environmental footprint of electronic communication** services should be developed by 2025. As a follow-up to the Commission's 2022 Digitalising the Energy System Action Plan, a Commission study has been conducted by the Joint Research Centre to explore the possibility to develop common indicators for measuring the environmental footprint of electronic communications services. The study report was published in March 2024 and will serve as a key input to the planned Code of Conduct on the same subject.[237]

BEREC has also compiled in a 2023 report a preliminary classification of sustainability indicators reviewed to assess environmental footprint and performance of electronic communications networks and services.[238] Note as well that the Commission has procured in January 2024 the development of a calculator to assess the GHG impact of audiovisual works in the context of the MEDIA strand of Creative Europe programme.

In February 2024, the Parliament and the Council reached a political agreement on the Commission proposal for a Directive on common rules promoting the repair of goods. The Directive aims to **facilitate and promote sustainable consumption** by obliging manufacturers of certain products (including smartphones and tablets) beyond the legal guarantee and promoting the choice of repair by consumers during the legal guarantee. A European online repair platform will inform consumers about the different repair services at EU level, across borders and in each Member State.

The Corporate Sustainability Reporting Directive (CSRD) entered into force in January 2023. This Directive **modernises and strengthens the rules concerning the social and environmental information that large compagnies and listed SMEs have to report**. These companies will have to apply the new rules for the first time in the 2024 financial year, for reports published in 2025, according to European Sustainability Reporting Standards. First standards agreed by Delegated Regulation have been published in December 2023. (*24b*)

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[237] Identifying common indicators for measuring the environmental footprint of electronic communications networks (ECNs) for the provision of electronic communications services (ECSs), ISSN 1831-9424.

[238] A BEREC 2024 Report provides further analysis into the empowerment of end-users via environmental information.

The [European Green Digital Coalition](#), formed in 2021, defines itself as '*an initiative of companies, supported by the European Commission and the European Parliament, based on the request of the EU Council, which aims to harness the enabling emission-reducing potential of digital solutions to all other sectors*'. The EGCD has developed a methodology to assess the net environmental impact of digital solutions and applied it to case studies in various sectors (energy, transport, agriculture, buildings, smart cities and manufacturing) to show the climate benefits of real-life digital solutions. It has also published [guidelines](#) on how to deploy **digital solutions to obtain positive climate benefits in these sectors** (*24c*).

Finally, the February 2024 Commission [White Paper](#) 'How to master Europe's digital infrastructure needs?' is calling for investments, including sustainable financing, so that connectivity can accelerate and enable the greening of other sectors, through smart digital solutions that reduce the climate and environmental footprint across industrial processes, energy systems, buildings, mobility, and agriculture, and thereby support the efforts towards climate neutral and smart cities.

**Member States action**

Sustainability is one of the areas of the Declaration where Member States reported the least implemented measures, with many of those being horizontal measures or investments in green technology and digital infrastructure, e.g. in the context of their Recovery and Resilience Plan.[239] Some Member States have put forward initiatives to support innovation in **digital solutions that have minimal negative or positive impact on the environment and climate (24a, 24c),** for example through research programmes**.** In Austria, the *AI for Green*[240] programme deals with the use of AI in the field of climate mitigation and adaptation, while in Latvia, the *Green and Smart Technology Cluster*[241] fosters collaboration among companies, education and research. Germany[242], Portugal[243] and the Netherlands[244] also took **measures to reduce energy consumption in the public sector,** including through sustainable IT procurement practices, and Estonia commissioned a study[245] to understand the environmental impact of digitisation in the public sector and plans to develop an action plan to reduce the environmental footprint of ICT.

Most Member States reported to have implemented measures to foster **sustainable and responsible corporate behaviour throughout ICT value chains** *(24b),* in line with EU

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[239] For example, Denmark, Germany and Finland.

[240] AI for Green, https://www.ffg.at/ai.

[241] Green and Smart Technology Cluster, https://greentechlatvia.eu/en/home/.

[242] Green IT initiative, launched in 2008, focuses on reducing energy consumption and GHG emissions in the public sector, capping the energy consumption caused by IT operations and implementing sustainable IT procurement practices. Since its inception, the initiative has significantly reduced energy consumption in the public sector. https://www.adesso.de/en/news/blog/green-it-sustainability-for-the-public-sector-2.jsp.

[243] The new green procurement strategy, ECO360, was launched in 2023 and foresees that by 2030 all public administration entities will have a strategy or plan for integrating environmental criteria into the procurement strategy, and that half of the contracts for the purchase of goods and services will adopt circularity criteria.

[244] Procurement with Impact is a sustainable, social and innovative procurement strategy for central government, 2019. https://www.government.nl/latest/news/2019/10/29/government-wide-procurement-sustainable-innovative-and-with-social-impact.

[245] Green Digital Analysis, 2022, on behalf of the Ministry of Economic Affairs and Communications. https://mkm.ee/en/node/8926.

initiatives to promote a circular economy.[246] France further introduced measures to include a bonus for repairing broken devices and an obligation for the manufacturer of the device to make available spare parts to the seller or the repairer within 15 working days.[247] Some Member States have also produced tools or guidelines to help companies integrate sustainable practices. In Denmark, the *Climate Compass*[248] provides information to companies about their greenhouse gas (GHG) emissions and offers ideas on how to reduce the climate footprint. Meanwhile, in 2022, Business Finland had developed a playbook[249] aimed at digital commerce SMEs to provide tools how sustainability can be integrated into the value chain, while the Lithuanian Ministry of Economy and Innovation has prepared the Advanced Manufacturing Guidelines, addressing the industrial transition to the circular economy, industrial digitalisation and integration into international value chains.[250]

In several Member States[251], initiatives have been taken by telecom operators to limit energy consumption and promote recycling of equipment, including Cyprus and Bulgaria[252]. In France, the national regulatory authority requires telecom operators to report on their emissions alongside other initiatives to better understand and address environmental impacts from ICT.[253]

When it comes to **supporting consumers in making sustainable choices** in relation to digital technology *(24b),* certain Member States reported having initiatives relating to the re-use of IT equipment. For example, Luxembourg has established an initiative to facilitate the recycling of mobile phones.[254] With logistical assistance from the postal service, mobile bags are transported to partner workshops, where recent and eligible smartphones are sorted out for reuse and then distributed to individuals in need. Several projects are also promoting awareness on the impact of electronic waste, such as the Polish *Sustainable Digital School*[255] project, where students create a performance, podcast, film or other educational and artistic content that draws attention to the harmful impact of electronic waste.

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[246] For example, under the European Commission's Circular Economy Action Plan of 2015.

[247] Law No. 2020-105 of February 10, 2020, relating to the fight against waste and the circular economy. https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000041553759.

[248] Climate Compass, https://klimakompasset.dk/klimakompasset/.

[249] https://www.businessfinland.fi/en/whats-new/news/2022/making-finland-a-superpower-in-sustainable-development.

[250] National Energy and Climate Action Plan 2021-2030 and Guidelines for Lithuania's transition to a circular economy until 2035. https://am.lrv.lt/lt/veiklos-sritys-1/klimato-politika/klimato-kaita/nacionalinis-energetikos-ir-klimato-srities-veiksmu-planas-2021-2030-m/.

[251] https://www.berec.europa.eu/en/document-categories/berec/reports/external-sustainability-study-on-environmental-impact-of-electronic-communication.

[252] In Bulgaria, 2022, the telecommunication service provider A1 Bulgaria and the Bulgarian clean energy investment group Renalfa AD, signed a long–term Power Purchase Agreement (PPA) for solar energy. The contract envisages the supply of 20,000 MWh of clean energy per year for the next 10 years. Meanwhile in June 2022, the Bulgarian telecom provider Neterra opened a new data centre designed with the latest generation of energy-efficient air conditioning systems. Also in 2022, United Group announced its plans for significant investments in Bulgaria's solar and wind renewable energy sources sector. Once operational, these will allow for saving more than 115,000 tons of CO2 emissions per year. The renewable energy plants are phased into operation starting from 2023.

[253] https://www.berec.europa.eu/en/document-categories/berec/reports/draft-berec-report-on-empowering-end-users-through-environmental-transparency-on-digital-products.

[254] https://digital-inclusion.lu/mobile-bag/.

[255] Sustainable Digital School, Implemented by Zaraz Wracam foundation and electronic recycle centers. https://zarazwracam.pl/zrownowazona-elektro-szkola/.

Fewer nationally specific initiatives seem to exist with regards to **sustainability labels for digital products and services** *(24d)*. A number of Member States[256] point to the introduction of the EU ecolabel as a cross-border indicator of environmental quality. France has taken additional steps with specific legislative measures in its transposition of provisions relating to combatting waste and promoting the circular economy.[257] The law, in force since 2022, provides that producers or importers of digital goods should provide information on repairability and sustainability, incorporation of recycled material, recyclability, the presence of precious metals or dangerous substances. Moreover, the law introduces an obligation for Internet service providers to inform their subscribers about the quantity of data consumed and indicate the corresponding GHG emissions produced.

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**Best practice**

In 2023, **Spain** has put forward a national programme for green algorithms. The Ministry for Digital Transformation issued a call for grants to finance the creation of academic chairs that promote research in the field of AI, including with a focus on the use of AI to support decarbonisation by improving efficiency in the use of resources. The Spanish authorities also awarded a contract for support to define energy consumption measurement standards in the development and training of AI algorithms, and create a quality seal for companies involved in sustainable AI or applying AI to address environmental issues.

In **Finland**, the Green ICT ecosystem, a professional network launched in 2022, promotes sustainable ICT services, products and processes in organisations. It aims to help ICT producers to minimise the negative impact of their operations, products and services and optimise ICT's positive impact on individuals, society, businesses, and the environment. The ecosystem was developed by Finnish NGOs TIEKE and TIVIA and the LUT University, as part of the project *A Green ICT ecosystem,* funded by the European Structural Fund.

In **Germany**, the City of Leipzig provides a good example how to foster sustainability of digital products. Leipzig is funding the Hardware for Future project, which is collecting, refurbishing and distributing previously used but still functional IT hardware from institutions, companies and individuals free of charge. The initiative is primarily targeted at economically disadvantaged families, children and students. Until December 2023, more than 3100 devices were successfully distributed in Leipzig. A similar project was also put forward by the Belgian City of Brussels.

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[256] Austria, Cyprus, Spain, Portugal.
[257] Law No. 2020-105 of February 10, 2020, relating to the fight against waste and the circular economy. https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000041553759/.