



NATIONAL DIGITAL DECADE STRATEGIC ROADMAP

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DEPUTY MINISTRY OF
RESEARCH, INNOVATION
AND DIGITAL POLICY
REPUBLIC OF CYPRUS

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I. Abbreviations Table

Abbreviations	Definition
AAS	as-a-service (model)
AI	Artificial Intelligence
B2G	Business to Government
BCO	Broadband Competence Office
BI	Business Intelligence
CAPA	Cyprus Academy of Public Administration
CaSToRC	Computation-based Science and Technology Research Centre
CCCI	Chamber of Commerce and Industry
CCS	Cyprus Computer Society
CEF	Connecting Europe Facility
CITEA	Cyprus Information Technology Enterprises Association
CPC	Cyprus Productivity Centre
CSR	Country Specific Recommendations
CY	Cyprus
Cyl	Cyprus Institute
CYQCI	Cyprus Quantum Communication Infrastructure
DBO	Design-Build-Operate
DD	Digital Decade
DEC	Department of Electronic Communications
DESI	Digital Economy and Society Index
DG REFORM	Directorate-General for Structural Reform Support
DiGiNN	Cyprus DIGital INNovation Hub'
DITS	Department of Information Technology Services
DMRID	Deputy Ministry of Research, Innovation and Digital Policy
DSF	Digital Services Factory
EBP	European Blockchain Partnership
EBSIC	European Blockchain Partnership and European Blockchain Service Infrastructure
EC	European Commission
ECDL	European Computer Driving Licence
EDIC	European Digital Infrastructure Consortium
EDIH	European Digital Innovation Hub
EECC	EU Electronic Communications Code
EEHRxF	European Electronic Health Record Exchange Format
EHDS	European Health Data Space
eID	Electronic Identity Card
EIF	European Interoperability Framework
ENISA	European Union Agency for Cybersecurity
ESIF	European structural and investment funds
EU	European Union
EUDIW	EU Digital Identity Wallet Pilot Implementation
EuroHPC JU	European High Performance Computing
EuroQCI	European Quantum Communication Infrastructure
FPA	Framework Partnership Agreement

FTTP	Fibre To the Premises
G2G	Government to Government
GDPR	General Data Protection Regulation
HIO	Health Insurance Organisation
HPC	High-Performance Computing
HQ	Head Quarters
HRDA	Human Resource Development Authority of Cyprus
ICT	Information and Communication Technology
IoT	Internet of Things
IT	Information Technology
K	Thousand
KPI	Key Performance Indicator
LSP	Large Scale Pilots
M	Million
ML	Machine Learning
MS	Member States
NBP	National Broadband Plan
NCC	National Competence Centre
NeHA	National Electronic Health Authority
NeHa	National e-Health Authority
NRA	National Regulatory Authority
OCECPR	Office of the Commissioner for Electronic Communications and Postal Regulation
PKI	Public Key Infrastructure
Q	Quarter
QCI	Quantum communication infrastructure
QCS	Quantum Computing & Simulation
R&I	Research and Innovation
RI3	Research and Innovation Smart Specialisation Strategy
RIF	Research and Innovation Foundation
RRF	Recover and Resilience Facility
RRP	Recovery and Resilience Plan
RTD	Road Transport Department
SED	Socio-Economic Driver
SMEs	Small-Medium size enterprises
STEM	Science, technology, engineering and mathematics
TSP	Trust Service Providers
VET	Vocational Education and Training
VHCN	Very High-Capacity Networks

II. Introduction

In today's world, digital transformation is no longer an option but rather a necessity that presents an enormous growth potential for countries across the globe. Digital transformation covers a wide range of technological, economic and societal innovations that result from digitization. In this context, in March 2021 the European Commission (EC) published a communication laying out its vision for 2030 in order to empower European citizens and businesses through digital transformation. The Digital Compass Communication¹ and the recently adopted Digital Decade Policy Programme 2030² aim to support the development and adoption of digital technology in order to drive economic growth and competitiveness, as well as to improve citizens' lives and governments effectiveness.

In this direction, the Cypriot Government has recently established Deputy Ministry of Research, Innovation and Digital Policy - DMRID (in March 2020), thereby demonstrating political commitment in accelerating the digital transformation of Cyprus and improve its position in the Digital Economy and Society Index (DESI) and making progress in the Digital Decade (DD) targets.

The digital transformation of Cyprus (CY) is a fundamental part of the overall policy and strategy of the Deputy Ministry of Research, Innovation and Digital Policy (DMRID). The mission of DMRID is fostering a new economic model with a vision for Cyprus to become a dynamic and competitive economy, driven by research, scientific excellence, innovation, technological development and entrepreneurship, and a regional hub in these fundamental areas.

Towards these objectives, Cyprus has adopted in June 2020 its National Digital Strategy 2020-2025³, which is broadly aligned with the European Union's (EU) Digital Decade Policy Programme 2030. The Strategy's mission is for Cyprus to become *"a fit-for-the-future society and knowledge-based economy enabled by digital and emerging technologies that will drive economic prosperity and competitiveness to position the country as a resilient regional player in the European digital economy and a regional science and high-tech hub"*⁴. The strategy evolves under five key pillars, which are presented in the following figure.

¹ EUR-lex, <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A52021DC0118>

² EUR-lex, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022D2481>

³ DMRID, [https://www.dmid.gov.cy/dmid/research.nsf/all/927EA351714F99EDC22587CE0028C090/\\$file/Digital%20Strategy%202020-2025.pdf?openelement](https://www.dmid.gov.cy/dmid/research.nsf/all/927EA351714F99EDC22587CE0028C090/$file/Digital%20Strategy%202020-2025.pdf?openelement)

⁴ Ibid 3.

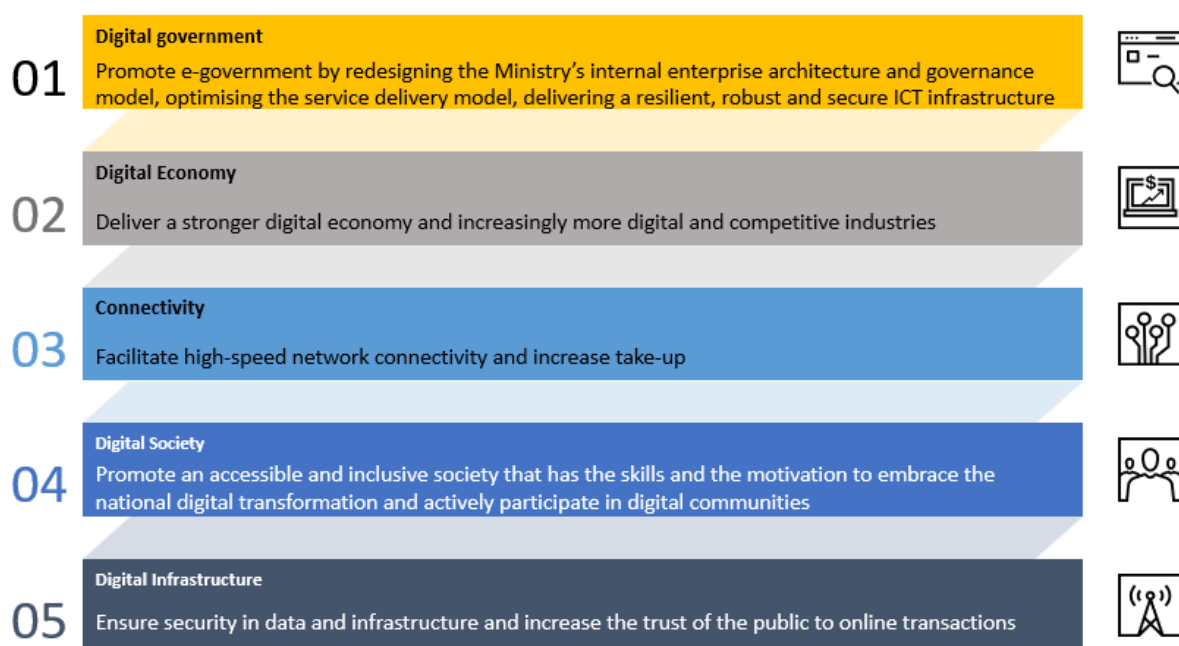


Figure 1 Strategic Pillars of CY National Digital Strategy

In addition, while pursuing the following four objectives of the National Digital Strategy, the DMRID is focusing on important strategic initiatives to drive the country's digitalization and anthropocentric character of the digital transformation and to develop a new economic model for Cyprus:

1. **Making technology work for people:** Technology should be designed with people in mind (user-centred), offering end-to-end quality services to citizens/businesses and optimisation of systems, structures and processes.
2. **Creating a fair and competitive digital economy:** The focus should be on the development of an economy where companies of all sizes, in any sector can compete on equal terms, while boosting business productivity and competitiveness through the development, marketing and use of digital technologies, products and services.
3. **Creating an open, democratic and sustainable digital society:** The focus should be on the development of a trustworthy society in which citizens and residents are empowered in how they act and interact, while building confidence that Cyprus' Digital Transformation journey is deeply rooted in democratic values, respects fundamental rights, and contributes to a more sustainable, resource-efficient economy.
4. **Making Cyprus a resilient regional player with seamless business environment:** The focus should be on the achievement of a digitally enabled, diversified economic growth through fast uptake of emerging technologies and alignment with global best practices and standards.

For the development of digital government projects, the approach is 2-tier: rapid deployment of small-scale digital solutions (microservices) and parallel longer-term implementation of strategic e-government projects. The DMRID has a holistic approach encompassing all governmental authorities. Its objective is to create an end-to-end, high-quality citizen-and business-experience throughout their interactions and 'touch-points' with the public sector, drive cost efficiencies, enhance reliability, security and resilience, and draw genuine trust in the system and the technologies themselves.

III. Objectives and Structure of the document

The current document represents the first version of Cyprus' National Digital Decade Strategic Roadmap, developed by the DMRID. It analyses the state-of-play of Cyprus' digital transformation with respect to the points set out in articles 3 & 4 of the Digital Decade Policy Programme 2030 of the EU⁵. It also provides a country-specific context as well as insights to the specific requirements of the digital targets as the basis for measures and the formulation of the national trajectories for achieving them.

Specifically, the objectives of the National Roadmap are to present:

1. the main planned, adopted and currently implemented policies, measures and actions in Cyprus that contribute to achieving the general objectives and the digital targets;
2. the national projected trajectories contributing to achieving the relevant digital targets;
3. the timeframe as well as the expected impact on achieving the general objectives and the digital targets.

In line with the European Commission (EC) approach, this National Roadmap is structured so that its chapters follow the four Cardinal Points introduced in the EU Digital Compass Communication⁶. Therefore, the document presents the state of play, maps the national trajectories and target values as well as analyses the policies, measures and actions Cyprus has planned in the four following areas:

1. Digital Skills
2. Digital Infrastructures
3. Digitalization of Businesses
4. Digitalization of Public services

The Roadmap includes also a chapter presenting existing plans and opportunities for developing further Multi-Country Projects (MCPs) combining investments from both national and EU funding sources. Lastly, the report includes a chapter focusing on stakeholder identification and engagement during the preparation of the individual measures as well as this National Roadmap as a whole.

⁵ EUR-lex, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022D2481>

⁶ Ibid 1.

IV. Analysis of the state of play, national trajectories and target values

1. Digital Skills

In today’s rapidly evolving world, it is of utmost importance that European economies and societies rely on digitally empowered and capable citizens, a digitally skilled workforce and way more digital experts than today. Therefore, as part of the Digital Compass, EU’s proposed level of ambition is that by 2030:

- 80% of all adults in EU have basic digital skills **(KPI 1. At least basic digital skills)**
- There are at least 20 million (M) employed Information and Communication Technologies (ICT) specialists in the EU with convergence between men and women **(KPI 2. ICT specialists in employment)**

Cyprus shows commitment to the collective effort of achieving the Digital Decade target regarding basic digital skills and ICT specialists. Indeed, in 2022, Cyprus reached the EU average of ICT specialists in employment (4.6%). Moreover, at 21.6%, its share of women among ICT specialists is higher than the EU average of 18.9%. However, only 50% of the population in Cyprus have at least basic digital skills, which is 4 percentage points below the EU average.

An overview of the current values of the KPIs related to Digital skills is presented in the figure below along with the 2030 projected values (based on historical data) and the 2030 target values.

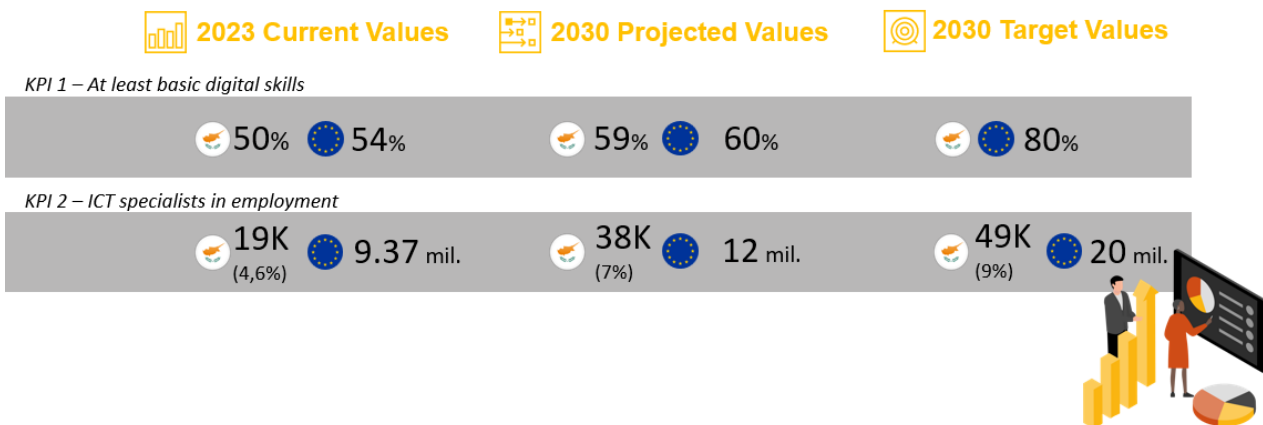


Figure 2 Digital Skills KPIs

Overall, through the development and implementation of the measures and actions described in this National Roadmap, the general objectives of DMRID for the “Digital Skills” cardinal point are:

- The improvement of society's response to the digitalisation challenge and the active participation of all citizens in digital upskilling and reskilling initiatives;
- Bridging the gap between supply and demand of ICT specialists in the labour market to cover the ever-increasing and more specialized needs of businesses in today's highly competitive environment;
- The re-design of the educational system, so that the digital skills of the future can start being introduced from pre-Primary Education.

1.1 Analysis of the State of play of digital skills in Cyprus

1.1.1 State of play

For Cyprus to meet the digital era needs, contribute substantially to the achievement of the objectives set out at European level and ensure the success of the digital switchover at national level, effective and coordinated action is required at all levels. Cyprus is currently invited to create more favourable conditions for innovation, development and new digital jobs and ensure that knowledge, skills, and capabilities, including ICT professionals, meet the highest global standards, and are constantly updated through an efficient life-long training procedure. DMRID aims to move forward with bold and vertical interventions to give everybody (including citizens, ICT professionals and enterprises) the appropriate skills to address the anticipated changes with promptness and efficiency.

In recent years, the Cypriot government has focused on improving holistically the digital skills of the population, since upgrading digital, entrepreneurial and innovative skills is an essential prerequisite for learning, working and actively participating in the digital society of the future. Trends in Cyprus show that age groups of 55-64 and 65-74, have far lower percentages of at least basic digital skills according to the latest statistics. In particular, the age group 55-64 has a 28,45% at least basic digital skills, while the age group of 65-74 has only 12,95%. Between these groups and younger ones (e.g. 19-19, 35-44) a large gap is observed which can reach up to 68,66 % difference. Culture and perceptions play a key role in this aspect. It is, therefore, essential to raise awareness on the importance of digital skills and provide incentives for people to pursue them.

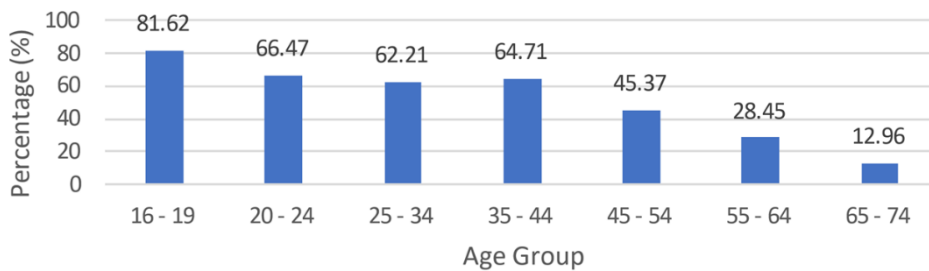


Figure 3 Basic or above digital skills per age group (Cyprus)

Additionally, regarding ICT professionals Cyprus is also faced with the global trend of the ever-growing gap between supply and demand for ICT professionals in the market, across all sectors of the economy. There is also a serious gender imbalance, with women making up just 21,6% of the workforce employed in the ICT sector in Cyprus.

In this context, the country has taken a number of steps towards improving its digital performance through coordinated actions for the implementation of the Digital Strategy for Cyprus, which is broadly aligned with the Digital Decade Policy Programme. However, progress is not distributed evenly across the different aspects of the Digital Decade.

Overall, according to the results of the Digital Economy and Society Index (DESI) for 2022, Cyprus ranks 21st in the EU in terms of the human capital parameter.

In particular, regarding basic digital skills, a little above 50% of the population (aged 16-74) have at least basic digital skills, a bit lower than the EU average (54%) and far from the 80% ambitious EU target for 2030)⁷.

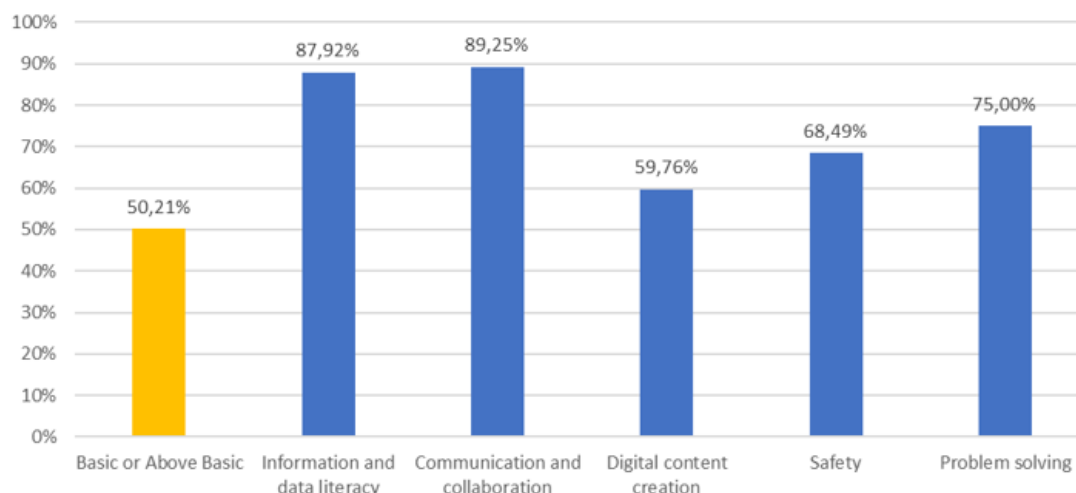


Figure 4 Basic or above skills for all population groups (16-74) in Cyprus

Moreover, at 21.6%, the share of women among ICT specialists is higher than the EU average of 18.9%. However, some challenges remain such as the low percentage of ICT graduates and the insufficient match between the academic courses available and the need for ICT specialists on the labour market. ICT graduates account for 2.8% of graduates in Cyprus, compared to the EU average of 4.2%.

Based on the above, according to the Cyprus Digital Decade Country Report⁸, it is recommended that Cyprus should accelerate its efforts in the area of digital skills, especially regarding training of citizens over 55 and other vulnerable people. This activity is consequently expected to contribute to improving the overall level of digital skills of the population. Also building on the Year of skills, targeted actions for awareness raising on the training courses available for the population is necessary to meet the Digital Decade objectives and targets.

Digital Skills in Cyprus Recover and Resilience Facility (RRF)

Cyprus' objective, with the support of the RRF, is to improve digital skills development in all population groups, including upskilling and reskilling of the workforce. Digital education and skills for all are one of the country's main priorities. Cyprus will invest around 24M euros in the development of digital skills by 2026, with the following measures:

- Digital transformation of school units with the aim of enhancing digital skills and skills related to Science, technology, engineering, and mathematics (STEM) education (13.8Meuros).
- e-skills Action Plan – implementation of specific actions (1.85M euros).
- Skilling, reskilling and upskilling - digital skills (8.42M euros).

1.1.2 Challenges

Challenge 1: Leaving no one behind - design and implement efficient and wider scale activities targeting vulnerable groups that are not easy to reach (e.g. people in remote areas, elderly, people with disabilities)

⁷ Digital Decade Country Report 2023

⁸ European commission, <https://digital-strategy.ec.europa.eu/en/library/2023-report-state-digital-decade>

Challenge 2: Existing shortage of ICT specialists - Current number of graduates in ICT studies is not sufficient to satisfy the increasing need for ICT specialists in the labor market. Promoting gender convergence in ICT specialists' jobs remains a challenge, as initiatives that target women are mostly limited to awareness campaigns.

Challenge 3: Reaching gender convergence to contribute to the Digital Decade target. Despite awareness raising campaign towards young people, the number of students, in particular girls and women studying STEM and computer sciences stagnates.

Challenge 4: Use of micro-credentials to accelerate the availability of skilled workers for the market needs. Cyprus is currently considering the use of micro-credential to certify learning paths for ICT specialists. Ideally, it would be created on the basis of an EU-wide certification system.

Challenge 5: Digital transformation of educational system

- Cyprus is in the process of evaluating the different vocational education and training (VET) systems, the curricula, the trainers, and the organizational structure of the system.
- Develop and certify teachers' training in digital skills: training is not compulsory for teachers. For the first time this year, there are signs showing that the pool of ICT teachers is reducing in some subjects (e.g., computer engineering) and could lead to a shortage soon.

Challenge 6: Develop connectivity infrastructure to reach rural areas and facilitate access to vulnerable groups.

1.1.3 Strengths and assets to be leveraged

Strength 1: Greater Impact - Based on Cyprus' small geographical footprint as a country (in comparison to other EU member states), targeted and specific designed actions and measures, are expected to have a greater impact and effect on the achievement of the strategic goals set on a national level.

Strength 2: Whole-government approach - DMRID is the designated single authority with horizontal responsibility to establish an efficient collaboration with the private sector and the national coordinator following up the implementation of the national strategy with a governance committee including the private sector. Cyprus has successfully designed and implemented this multi-stakeholder approach, where all parties join forces efficiently and in harmony to achieve common objectives.

1.2 National trajectories and target values to contribute to the EU's digital skills KPIs

This section includes information that showcases the national trajectories and target values that EU and Cyprus have set for Digital Decade *KPI 1 – Basic Digital Skills* and *KPI 2 - ICT specialists in employment*.

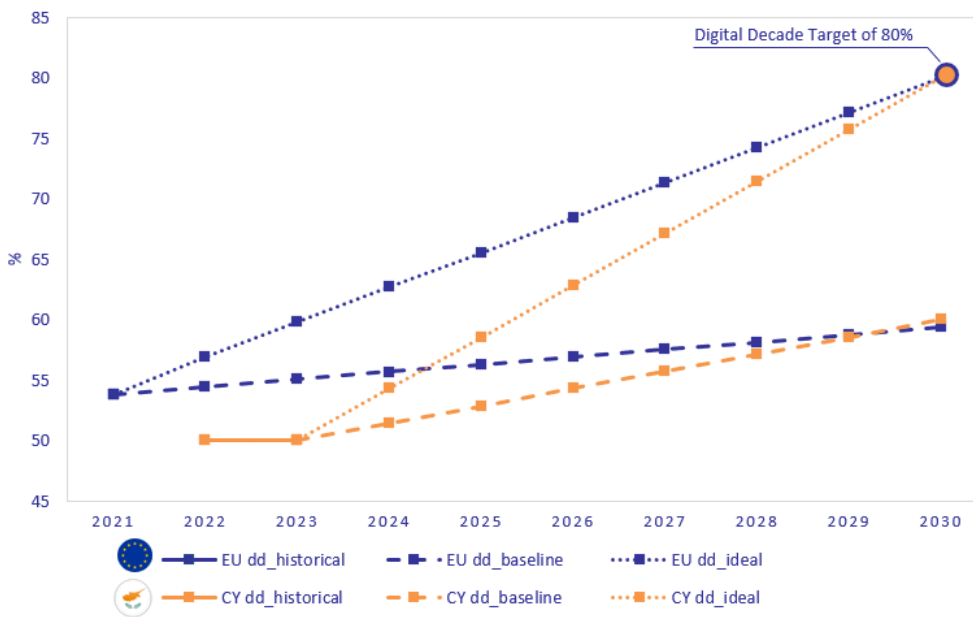
In the following graphs the label "dd – historical" indicates the actual progress made in EU and CY regarding the above-mentioned KPIs in recent years (where data was available to Cypriot Authorities). The label "dd – baseline" indicates the trajectory that the EU and CY would have followed until 2030 in the absence of the Digital Decade Programme and respective measures/actions. Lastly, the label "dd – ideal" indicates the path that EU and CY are expected to follow until 2030 in order to reach the target value, by implementing the measures and actions related to DD targets. For the case of CY, the measures described also within this National Roadmap have been taken into account for the calculation of its ideal trajectory.

KPI 1 - At least basic digital skills

In this area, a slow increase of the percentage of population with at least basic digital skills is being observed in CY. Under current conditions (baseline trajectory) and given the challenge of CY with digitally training people over 55, the percentage of CY citizens with basic digital skills will be close to 59% by 2030. The gap between estimated 2030 value and the Digital Target set is 21% for the case of CY. The proposed 2023 target, as well as the ideal trajectory, are based on the condition that the

measures presented in Section 1.3 will be implemented and that the challenges identified will be addressed.

Basic Digital Skills



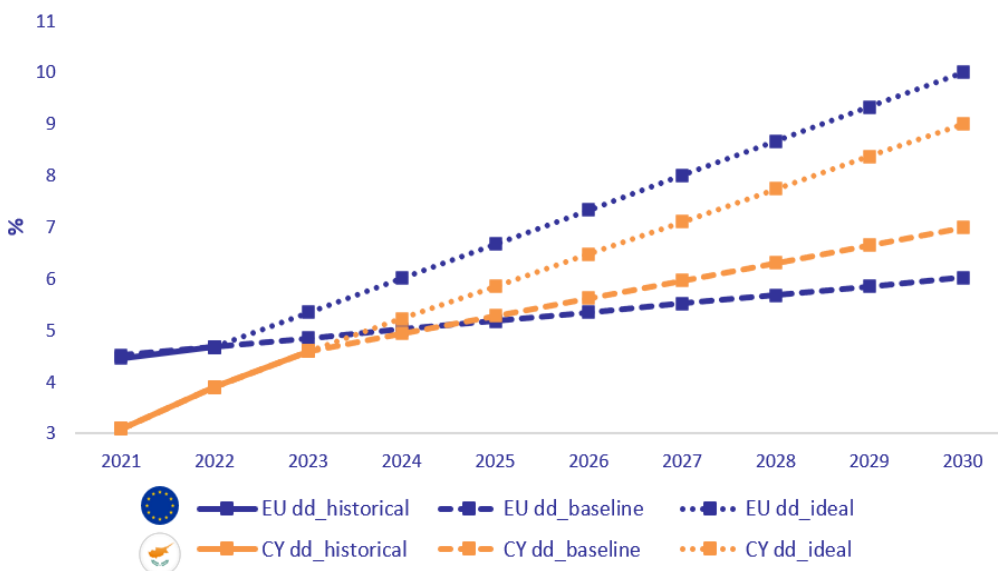
Year	National DD Target (ideal)
2024	54%
2025	59%
2026	63%
2027	67%
2028	71%
2029	76%
2030	80%

Figure 5 KPI 1 National and EU ideal and projected trajectory

KPI 2 - ICT specialists in employment

In this area, a relatively steady increase of the number of ICT specialists in employment in CY is being observed. Based on the CY ideal trajectory and given the efforts to boost the numbers of young people choosing this sector, the number of ICT specialists in employment in CY is expected to be close to 49 thousand (K) by 2030. The proposed target, as well as the ideal trajectory, are based on a linear stable growth model assumption and on the condition that the measures presented in Section 1.3 will be implemented and the challenges identified will be addressed.

ICT specialists



Year	National DD Target (ideal)
2024	5,2%
2025	5,9%
2026	6,5%
2027	7,1%
2028	7,7%
2029	8,4%
2030	9,0%

Figure 6 KPI 2 National and EU ideal and projected trajectory

1.3 Policies, measures and actions to achieve the digital skills KPIs targets

1.3.1 General overview of measures per digital skills KPIs targets

Based on the strengths and challenges described above, Cyprus and specifically DMRID has started implementing a series of measures aiming to the development and continuous updating of the digital skills in all population groups and at all levels. The measures regarding training and updating of digital skills are covering starting, intermediate as well as advanced learners by offering training in different groups according to the specific needs of each group. Special target groups have also been identified (e.g. women in rural areas) and individual measures have been designed according to their needs. Also, an eLearning library will be developed among the measures providing online and free access content for all those who want to improve, strengthen and develop their digital skills.

Regarding ICT professionals, the measures implemented are targeting both a part of the unemployed ICT population in Cyprus as well as interested people in following an ICT career in the future. Taking into account the gender gap in ICT professionals in Cyprus, a particular reference to the promotion of participation of girls and women in the ICT sector is also made in the Communication Strategy which is aiming to raise overall awareness on the issue.

The DMRID is expecting that the measures will positively affect the Cypriot society’s response to the digital challenge and encourage active participation of all citizens in the digital society and economy by raising basic digital skills of population to 80% by year 2030 and increasing the number of ICT professionals.

Measures that contribute to KPI 1 & 2	2023	2024	2025	2026	2027	2028	2029	2030
Measure 1: Trainings for strengthening digital skills of employed and unemployed persons by Human Resource Development Authority of Cyprus (HRDA)								
Measure 2: Training program to develop digital skills in the public service by Cyprus Academy of Public Administration (CAPA)								
Measure 3: Training for upgrading digital skills of women in rural and remote areas								
Measure 4: National Digital Academy - Digital Coalition Platform								
Measure 5: ICT Re/Up Skilling Program								
Measure 6: Raising Awareness - Development of Communication Strategy								
Measure 7:								

Measures that contribute to KPI 1 & 2	2023	2024	2025	2026	2027	2028	2029	2030
Funding of Events of Research and Innovation Foundation (RIF)								
Measure 8: Promotion of Digital Skills by Cyprus Productivity Centre (CPC)								
Measure 9: Digital transformation of school units with the aim of enhancing digital skills and skills related to STEM education by the Ministry of Education								
Measure 10: Training and certification programs for Public Administration professionals (Project Management, Cyber Security Skills, training courses on specialised areas)								

Budget of all the measures that can be attributed to KPI 1,2

Measures	1	2	3	4	5	6	7	8	9	10
Target Impact (KPI)	1&2	1	1	1&2	2	1	1	1	1&2	1&2
Total Budget (€)	6.47 M	459K	tbd	190K	90K	500K	200K	360K	13.8M	450K
National Funds	-	-	-	-	-	-	-	-	-	-
Allocated	-	-	-	-	-	-	-	-	-	-
Planned	-	-	-	-	-	-	-	-	-	-
Eu Funds	6.47 M	459K	tbd	190K	90K	500K	200K	360K	13.8M	450K
Allocated	-	-	-	100K CEF	-	-	-	-	-	-
Planned	-	-	-	90K RRF	90K	500K	200K	360K	13.8M	-

1.3.2 Description of the measures expected to address the challenges for KPI 1,2

Measure 1 - Trainings for strengthening digital skills of 20.210 employed and unemployed persons by Human Resource Development Authority of Cyprus (HRDA)	
New measure	NO
Short description of the measure	<p>Content of the measure: Human Resource Development Authority of Cyprus (HRDA) undertook a scheme to provide trainings for strengthening digital skills of 20.210 employed and unemployed persons. The aim of this measure is to strengthen the digital skills of Cypriot citizens. The training will support actions primarily concerning private and public sector employees, the self-employed and the unemployed. Special emphasis will be given to reach digitally illiterate people, irrespective of age, educational attainment level and geographic location in Cyprus.</p> <p>Link to the target: The Project aims to acquire new and upgrade the existing digital skills of the human resources of Cyprus, through their participation in training programs that will be implemented by Vocational Training Centers.</p> <p>Beneficiaries for participation in the Project are natural persons, employed in the private and public and wider public sector, self-employed and unemployed, who consider that their participation in the training program satisfies individual training needs.</p> <p>Tentative timeline: Q4 2024 - Completion of trainings for at least 7.000 participants in programmes for digital skills. Q4 2025 - Completion of trainings for at least 20.210 participants in programmes for digital skills.</p>
Budget or other resources allocated or planned:	<p>EU: 6.47Meuros</p> <p>Human resources mobilized: The scheme is under the responsibility of the Training Directorate of HRDA and the team is consisted by a Senior Officer, three Officers A' and two Officers.</p>
Expected impact and related timing:	<ul style="list-style-type: none"> - Signature of contracts with accredited Vocational Training Centres to deliver basic digital skills trainings has been completed. - It is expected that to up to 9.056 persons will participate in the trainings which will including topics on Internet and email, Word processing, Spreadsheets, Presentations, Databases and Digital Marketing Skills (1,20% of active population⁹ – ages 14- 65+) - When the trainings have been completed (Q4 2025) at least 20.210 participants are expected to have been re-trained for digital skills (2,7% of active population¹⁰ – ages 14- 65+)

⁹ According to 2021 statistical data

¹⁰ According to 2021 statistical data

	<p>- Trainings are also expected to up to 1.344 ICT professionals (8,7% of current ICT professionals in Cyprus¹¹) The full topics of the programmes are presented in Annex 2.</p>																																																		
<p>Measure 2 - Training program to develop digital skills in the public service by Cyprus Academy of Public Administration (CAPA)</p>																																																			
<p>New measure</p>	<p>NO</p>																																																		
<p>Short description of the measure</p>	<p>Content of the measure: The Cyprus Academy of Public Administration (CAPA) in the context of the co-financed Project "Learning Support for the Implementation of Administrative Changes in Public Administration", has gathered the learning needs related to the development of digital skills in the public service.</p> <p>In order to effectively satisfy the learning needs identified, 5 separate actions were organized. The learning needs that have been collected are divided into two levels, the basic level and the advanced level, and they concern the organization of the programs below:</p> <table border="1" data-bbox="491 817 1465 1514"> <thead> <tr> <th>Action</th> <th>Software</th> <th>Basic level</th> <th>Advanced level</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Microsoft Word</td> <td>60</td> <td>78</td> <td>138</td> </tr> <tr> <td>2</td> <td>Microsoft Excel</td> <td>96</td> <td>106</td> <td>202</td> </tr> <tr> <td rowspan="2">3</td> <td>Microsoft Power Point</td> <td>37</td> <td>46</td> <td>83</td> </tr> <tr> <td>Microsoft Outlook</td> <td>57</td> <td>56</td> <td>113</td> </tr> <tr> <td rowspan="2">4</td> <td>Microsoft Access</td> <td>49</td> <td>35</td> <td>84</td> </tr> <tr> <td>Microsoft Project</td> <td>38</td> <td>25</td> <td>63</td> </tr> <tr> <td rowspan="4">5</td> <td>Social Media</td> <td></td> <td></td> <td>41</td> </tr> <tr> <td>Use of electronic tools for effective telecommuting</td> <td></td> <td></td> <td>76</td> </tr> <tr> <td>Use of Electronic Distance Learning Tools</td> <td></td> <td></td> <td>20</td> </tr> <tr> <td>E-collaboration and productivity tools (Ms Planner, MsOneDrive, Ms Sharepoint)</td> <td></td> <td></td> <td>30</td> </tr> </tbody> </table> <p>Link to the target: The action contributes to the digital target as the public administration is a significant part of the Cyprus population (10% according to 2021 statistics).</p> <p>Tentative timeline: Section 1 : 05/2022 – 10/2023 Section 2 : 12/2022 – 09/2024 Section 3 : 05/2022 – 10/2023 Section 4 : 12/2022 – 09/2024 Section 5 : 12/2022 – 09/2024</p>	Action	Software	Basic level	Advanced level	Total	1	Microsoft Word	60	78	138	2	Microsoft Excel	96	106	202	3	Microsoft Power Point	37	46	83	Microsoft Outlook	57	56	113	4	Microsoft Access	49	35	84	Microsoft Project	38	25	63	5	Social Media			41	Use of electronic tools for effective telecommuting			76	Use of Electronic Distance Learning Tools			20	E-collaboration and productivity tools (Ms Planner, MsOneDrive, Ms Sharepoint)			30
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¹¹ According to 2021 statistical data

Budget and other resources allocated or planned:	EU: 459K euros in total Section 1: 74.520 € Section 2: 109.080 € Section 3 : 105.840 € Section 4 : 79.380 € Section 5 : 90.180 €
Expected impact and related timing:	Approximately 8.000 individuals with at least basic digital skills until end of 2024 (20,25% of the people working in Public administration, defence or compulsory social security sector in Cyprus ¹²).

Measure 3 - Training for upgrading digital skills of women in rural and remote areas

New measure	YES
Short description of the measure	<p>Content of the measure: Provision of targeted training for upgrading digital skills of women in rural and remote areas, in collaboration with various stakeholders – Deputy Ministry of Research, Innovation and Digital Policy, Commissioner for Gender Equality, Commissioner for the Environment and the Youth Board of Cyprus.</p> <p>By providing women with the digital skills, they need to succeed, targeted training programs can help to reduce gender inequality. Digital skills can help women – especially those in rural and remote areas - to access essential services, such as healthcare, education, and financial services.</p> <p>Link to the target: At least basic digital skills</p> <p>Tentative timeline: 2024 - 2026</p>
Budget and other resources allocated or planned:	To be determined
Expected impact and related timing:	Indicatively, at least 150 women in decentralize areas increase their level of digitalization until the end of 2023 (50 women/year)

Measure 4: National Digital Academy - Digital Coalition Platform

New measure	NO
Short description of the measure	<p>Content of the measure: The implementation of a dynamic, user-friendly and universally accessible electronic platform, that will include the following:</p> <ul style="list-style-type: none"> • An index of the available educational programmes for digital skills offered to all bodies involved that will be the members of the National Alliance • A self-assessment tool that will provide to the citizens the possibility to assess their digital skills. The results of the self-assessment shall make an individual recommendation for the courses to be attended in order to improve their digital skills, according to their preferences and data • eLearning Library <p>Link to the target:</p>

¹² According to 2021 population statistics

	<p>The measure contributes to the digital target by providing information on available training programs to general population aiming to promote digital literacy across the whole spectrum of society (from foundation to advanced level).</p> <p>Tentative timeline: The Platform is live from Q3 of 2023 and onwards, and will be further dynamic enriched with participants and content information.</p>
Budget allocated or planned and, if relevant, other resources – including human resources – allocated:	<p>National: to be determined</p> <p>EU: 100K euros through CEF, 90K euros through RRF</p>
Expected impact and related timing:	Significant increase of Cyprus population basic digital skills level until end of 2030

Measure 5: ICT Re/Up Skilling Program

New measure	NO
Short description of the measure	<p>Content of the measure: Implementation of a designed reskilling-upskilling training program, targeting a designated portion of the unemployed population, qualified in STEM sciences. With the appropriate provided training, the participants will be given the opportunity to diversify their professional path and continue their employment in ICT related labour field. The initiative will be piloted on Business Intelligence (BI) topic.</p> <p>Link to the target: The measure contributes to the increase of ICT specialists in employment, by reskilling existing STEM qualified population and improving employability opportunities.</p> <p>Tentative timeline: The training program will commence in Q1 of 2024 and the first results are expected in Q2 of 2024.</p>
Budget and human resources allocated or planned:	EU: 90K euros through RRF
Expected impact and related timing:	The pilot training program will impact 15 ICT sector employees. Similar training programs will be determined and introduced upon evaluation of impact at a later stage with estimated impact of 60 persons per annum.

Measure 6: Raising Awareness - Development of Communication Strategy

New measure	NO
Short description of the measure	<p>Content of the measure: Development of a communication strategy to promote life-long learning and a digital culture, including events, competitions promoting digital skills, STEM, innovation and entrepreneurship – utilise e-Skills Ambassadors throughout the country. Particular reference is made to the promotion of participation of girls and women in the ICT sector to respond effectively to the gender gap.</p> <p>The measure will include the following initiatives:</p> <ul style="list-style-type: none"> • Events' funding • Digital Championship

	<ul style="list-style-type: none"> • Communication and awareness strategy • Deployment of eSkills Ambassadors <p>Link to the target: The measure contributes to the digital target by raising awareness, informing about and promoting life-long learning and digital culture, in order to ensure that the whole society accepts, requests and actively participates in the digital switchover. Tentative timeline: The measure will be available in 2024</p>
Budget and other resources allocated or planned:	EU: 500K euros through RRF
Expected impact and related timing:	Raise digital awareness in Cyprus population by promoting digital culture.

Measure 7: Funding of Events of Research and Innovation Foundation (RIF)

New measure	NO
Short description of the measure	<p>Content of the measure: Funding of events related to the promotion of the acquisition of digital and STEM skills, as well as their use in innovation and entrepreneurship, through a targeted call from the RIF and utilizing the mechanism of the RIF for the selection of proposals, through the granting of relevant sponsorship.</p> <p>Link to the target: The measure contributes to the digital target by raising awareness in research and innovation, to promote STEM skills and digital culture.</p> <p>Tentative timeline: 2022-2026</p>
Budget and other resources allocated or planned:	EU: 200K euros (40K per year)
Expected impact and related timing:	Significant increase of Cyprus population digital culture level until end of 2030

Measure 8: Promotion of Digital Skills by Cyprus Productivity Centre (CPC)

New measure	NO																																												
Short description of the measure	<p>Content of the measure:</p> <ol style="list-style-type: none"> 1. Organization of training programs aimed at unemployed and workers in the private and public sector as well as the self-employed, based on past scheduled actions <p>Year 2022</p> <table border="1"> <thead> <tr> <th>#</th> <th>Software</th> <th>Programs</th> <th>Participants</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Word (Basic)</td> <td>1</td> <td>3</td> </tr> <tr> <td>2</td> <td>Word (Advanced)</td> <td>1</td> <td>8</td> </tr> <tr> <td>3</td> <td>Excel (Basic)</td> <td>7</td> <td>67</td> </tr> <tr> <td>4</td> <td>Excel (Advanced)</td> <td>6</td> <td>70</td> </tr> <tr> <td>5</td> <td>PowerPoint</td> <td>1</td> <td>8</td> </tr> <tr> <td>6</td> <td>Social Media Marketing</td> <td>4</td> <td>63</td> </tr> <tr> <td>7</td> <td>Internet Security</td> <td>2</td> <td>15</td> </tr> <tr> <td>8</td> <td>Distance education and work</td> <td>4</td> <td>42</td> </tr> <tr> <td>9</td> <td>Cyber security</td> <td>2</td> <td>22</td> </tr> <tr> <td>10</td> <td>Internet & Outlook</td> <td>3</td> <td>29</td> </tr> </tbody> </table>	#	Software	Programs	Participants	1	Word (Basic)	1	3	2	Word (Advanced)	1	8	3	Excel (Basic)	7	67	4	Excel (Advanced)	6	70	5	PowerPoint	1	8	6	Social Media Marketing	4	63	7	Internet Security	2	15	8	Distance education and work	4	42	9	Cyber security	2	22	10	Internet & Outlook	3	29
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	Total	31	327
Year 2023 (01/2023 until 06/2023)			
#	Software	Programs	Participants
1	Word (Advanced)	2	20
2	Excel (Basic)	12	142
3	Excel (Advanced)	13	150
4	Internet Security	11	113
5	Distance education and work	2	18
6	Social Media Marketing	7	73
7	Powersoft Accounting	2	22
Total		49	538
	<p>2. Investing in digital infrastructures by provision of digital equipment and upgrading facilities to support the provision of digital learning and skills across society (academic institutions, enterprises, public bodies, elderly caring homes etc.), to enable more courses in Digital Skills based on the current population needs</p> <p>Link to the target: The measure contributes to the digital target by</p> <ul style="list-style-type: none"> - providing training programs to general population aiming to promote digital literacy across the whole spectrum of society - upgrading digital infrastructure in facilities base on existing gaps and needs <p>Tentative timeline: The measure will run until 2030</p>		
Budget and other resources allocated or planned:	EU: Training programs: 300K euros through RRF Digital infrastructure: 60K euros through RRF		
Expected impact and related timing:	Approximately 7000 individuals with at least basic digital skills until end of 2030 (0,93% of total active population of Cyprus – ages 14-65+).		

Measure 9 – Digital transformation of school units with the aim of enhancing digital skills and skills related to STEM education by the Ministry of Education

New measures	NO
Short description of the measures	<p>Content of the measure:</p> <p>The digital transformation of school units is a fundamental part of the overall overarching policy of Cyprus’ digital transformation agenda, which falls under the competences of the Deputy Ministry of Research, Innovation and Digital Policy. This measure will be implemented by the Ministry of Education, Culture, Sport and Youth. The overarching objective is the transformation of the curriculum and the development of the educational material to achieve the digital transformation of school units. We tackle this by developing digital skills as a cross-curricular theme from primary to secondary education and by incorporating STEAM teaching methodology. It is necessary to provide the resources in school classrooms and the respective training for teachers.</p> <p>Specifically, the measure will include:</p> <ul style="list-style-type: none"> - Updating schools’ connectivity networks by integrating online digital platforms and tools to allow schools to develop their digital-action plan - Equip classrooms with digital assets to allow student to develop and apply digital skills in their learning experience

	<ul style="list-style-type: none"> - Establishment of new technical schools and upgrade of existing ones - Introduction of new specializations and training programs relevant to the labour market needs (e.g. Computer Engineering, Networks and Communications, Digital Technology and Programming). - ICT-related accredited programmes offered for study - Prepare education materials for 120 school subjects to enhance digital skills and STEAM methodology as a cross-curricular theme - Introducing innovative teaching and training methods by the use of e-platforms - Hybrid learning programs - For special needs education, the Ministry is exploring schemes in schools to provide grant for purchase of digital assets (laptop/tablets) and also support disadvantaged students by enabling interaction with STEM/robotic skills - In collaboration with CCS and DMRID, ECDL programmes and certification are being offered to students in secondary education. <p>Link to the target: Based on an interdisciplinary approach, using science, technology, engineering, arts and mathematics as access points for the cultivation of research, dialogue, and critical thinking, digital skills are also developed in students of all ages.</p> <p>Tentative timeline: 2022 - 2030</p>
<p>Budget and other resources allocated or planned:</p>	<p>EU 13.8M euros through RRF</p>
<p>Expected impact and related timing:</p>	<ul style="list-style-type: none"> - Digitally equip at least 700 schools with laptops, projectors, microphones, speakers, digital graphic boards by Q2 2023 - Curriculum transformation and production of educational material for digital skills by Q4 2024 - STEM methodology for 120 school subjects by Q4 2024 - By Q2 2026, at least 675 (out of which 300 primary, 300 secondary general and 75 secondary vocational teachers) teachers per year for 5 years (in total at least 3375 teachers) which accounts for around 32% of all teachers (primary and secondary), have benefitted from In-Service Training & Professional Development on Digital Competences. <p>All the above mentioned will have a significant indirect impact in promoting ICT graduates, STEM skills and digital culture in Cyprus.</p>

Measure 10: Training and certification programs for Public Administration professionals	
<p>New measure</p>	<p>NO</p>
<p>Short description of the measure</p>	<p>Content of the measure:</p> <ol style="list-style-type: none"> 1. Design and implementation of targeted programs for public sector professionals for digital skills and cross-sectoral competences (such as project management). 2. Other training courses and certification of DMRID staff in specialised areas (Database, Security, Development, New Technologies, Microsoft Technical, Virtualizations etc.) 3. Implementation of trainings for civil servants on Cyber Security issues in collaboration with the CAPA (3000 training needs have been identified) 4. Access to an Educational Platform for Cybersecurity issues for the training of 10,000 Public Administration employees in collaboration with the DITS.

	<p>Link to the target: The action contributes to the digital target as the public administration is a significant part of the Cyprus population.</p> <p>Tentative timeline: 2021 - 2026</p>
Budget and other resources allocated or planned:	EU: 450K euros through RRF
Expected impact and related timing:	Impact on Public Administration staff (which is approximately 10% of working employees in Cyprus) regarding specialised areas and cross-sectoral competences.

2. Secure and sustainable digital infrastructures (KPI 3, 4, 5, 6, 7, 8)

Achieving digital leadership and global competitiveness require substantial investments on sustainable digital infrastructure, especially as regards connectivity, microelectronics and data processing. These are considered key enablers for other technological developments in EU economies and also support the competitive edge of many European industries. Therefore, as part of the Digital Compass, EU's proposed level of ambition is that by 2030:

- All populated areas (100%) are covered by next-generation high-speed networks with performance at least equivalent to that of 5G (**KPI 3 – Very High-Capacity Networks (gigabit)**)
- All end users at a fixed location are covered by a gigabit network up to the network termination point (**KPI 4 – Fibre to the Premises (FTTP)**)
- All populated areas are covered by 5G wireless networks (KPI 5 – 5G Coverage)
- The production of cutting-edge semiconductors in the EU is at least 20% of world production in value (**KPI 6 – Semiconductors**)
- At least 10.000 climate-neutral highly secure edge nodes are deployed in the EU, distributed in a way that guarantees access to data services with low latency (i.e. a few milliseconds) wherever businesses are located (**KPI 7 - Edge nodes**)
- the EU has, by 2025, its first computer with quantum acceleration, paving the way for the Union to be at the cutting edge of quantum capabilities by 2030 (**KPI 8 - Number of quantum computers**).

In addition, fixed and mobile connectivity are a prerequisite and an essential enabler for digital transformation and inclusion, as reflected in the Declaration on Digital Rights and Principles¹³. The EU is approaching a defining moment where new connectivity services will rapidly emerge from technological developments and synergies between terrestrial, space and sea infrastructures.

¹³ EUR-lex, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:JOC_2023_023_R_0001

An overview of the current values of the KPIs 3 & 4 related to Digital infrastructures is presented in the figure below along with the 2030 projected values (based on historical data) and the 2030 target values.

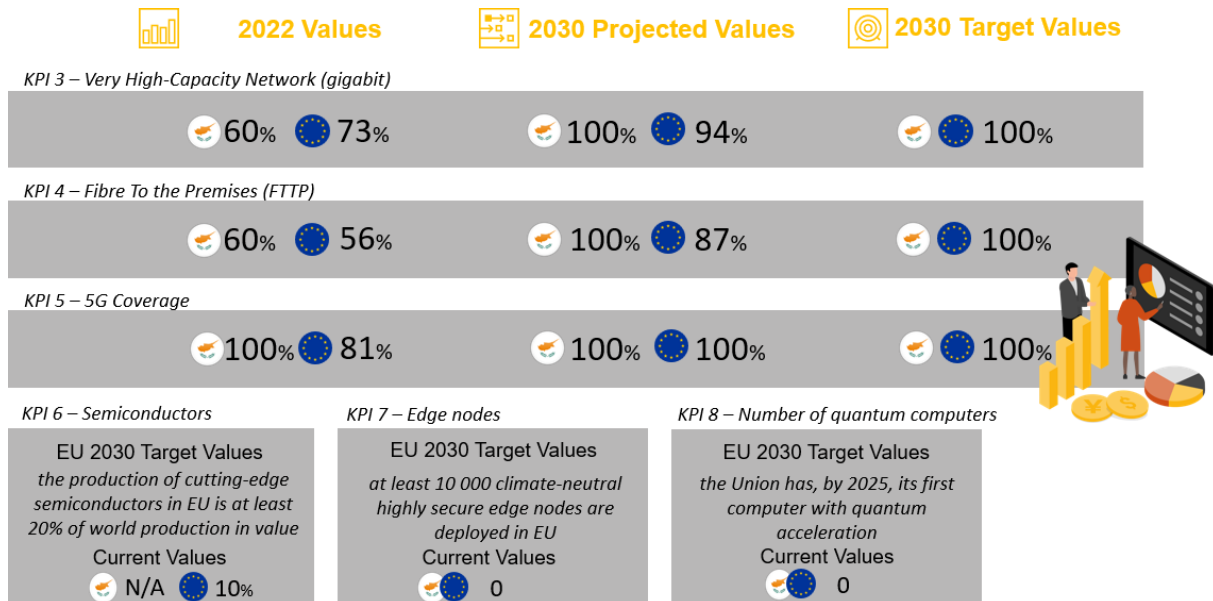


Figure 7 Digital Infrastructure KPIs

Regarding KPIs 6 - 8, national target and projected values for Cyprus have not been yet defined, as the Cypriot market of semiconductors, edge nodes and quantum computing is not yet developed due to the size of the economy and the geographical location of the country. These KPIs will be re-evaluated by DMIRD in the up-coming years and relevant targets will be added to the National Roadmap in case the KPIs become applicable for the case of Cyprus.

Overall, through the development and implementation of the measures and actions described in this National Roadmap, the general objectives of DMRID for the “Secure and sustainable digital infrastructure” cardinal point are:

- Facilitating private investments in digital infrastructure deployment as much as possible by removing administrative barriers and encouraging relevant stakeholders’ co-operation;
- Ensuring comprehensive availability and the widest adoption of ultrafast broadband services;
- Exploring Cyprus’ market capabilities regarding semiconductors, edge nodes and quantum computing and contribute respectively to EU DD targets.

2.1 Analysis of the State of play of connectivity in Cyprus

2.1.1 State of play

The current situation in Cyprus demonstrates fast fibre deployment for Very High-Capacity Networks (VHCN), mainly in urban areas and almost non-existing in rural. Even though significant progress has been made the last few years, a digital divide still persists in Cyprus. According to DESI 2023, Cyprus lags behind in “At least 1 Gbps broadband take-up”, “At least 100 Mbps broadband take-up” and the “Fixed Very High-Capacity Network (VHCN) coverage” compared to EU average. While “Overall 5G coverage” and “Mobile broadband take-up” is among the factors boosting Cyprus’ ability to benefit from the digital economy, the main challenge remains to encourage take-up of ultrafast broadband. Take-up is influenced by factors such as high pricing, lack of compelling content with many e-

government projects still under implementation, low digital literacy with only 50% of citizens having basic digital skills and low fixed VHCN coverage.

As regards advanced digital infrastructure, Cyprus' contribution to the Digital Decade targets is currently limited in scope.

- In cutting-edge semiconductors, Cyprus is among the Member States that have signed the joint declaration on the next-generation of processors and semiconductor technologies. However, the country's contribution to the production value in semiconductors is limited. Cyprus expressed its availability and willingness to contribute to the EU's security of supply, resilience and technological leadership in semiconductor technologies and applications through the recently announced European Chips Act, and the work of the 'Semiconductor Expert Group' and of the forthcoming 'Semiconductor Board.'
- There is no activity in the field of edge node development.
- Cyprus is developing activities in the field of quantum computing. In partnership with the Centre for Quantum Technology and Applications Deutsches Elektronen-Synchrotron (DESY), the Cyprus Institute is coordinating the "Quantum computing for Excellence in Science and Technology" ERA project funded by the Widening action of EU. The project aims to provide training in the use of quantum computing for academics, research institutions and industry. The project was launched in January 2023 and will run for 5 years (total funding 2.5M euros). In addition, the Cyprus Quantum Communication Infrastructure (CYQCI) project aims to be the first on deployment of quantum communications in Cyprus, introducing the technology to the island and laying the foundations for the country's active participation in the European Quantum Communication Infrastructure (EuroQCI). The project started in January 2023 and will run for 36 months (total budget of 7.5M euros). The Department of Physics of the University of Cyprus is coordinating the European Joint Doctorate project "Advanced computing, quantum algorithms and data-driven approaches for science, technology and engineering". The project aims to train researchers in physics, engineering and biology to use classical and quantum computing in their applications.

Since 2019, the country has participated in the European High-Performance Computing (EuroHPC JU). It has appointed members to its Governing Board and is co-funding the operation of the national HPC competence centre (NCC) with 1M euros for the two years from 2020 to 2022 under the EuroCC project. The NCC is coordinated by the Cyprus Institute's Computation-based Science and Technology Research Centre (CaSToRC). The role of the NCC is to provide technical support and promote HPC for research and commercial use. The EuroCC project was successfully carried out by CaSToRC and the second phase (i.e., EuroCC2) is implemented from 2023 to 2025, with budget of 2M euros and co-funding of 1M(via 2021-2027 European Structural and Investment Funds). The focus of EuroCC2 is to provide technical support to the Cyprus computational community, with a strong focus on training and industry.

Furthermore, based on Cyprus' market structure, state-owned incumbent *Cyta* continues to hold the largest market share in fixed telephony, broadband and IPTV/CableTV, followed by *Cablenet* who is operating an alternative cable infrastructure, *Primetel* and *EPIC*. All four companies are actively competing at both fixed and mobile markets providing a wide range of communication services combining fixed, broadband, mobile and TV services. However, the broadband market in Cyprus is rather saturated as, according to the latest data, at the end of 2020, 92.8% of Cypriot households have broadband connections with only 1.7% yearly growth. Trends also show that the mix of fixed

broadband subscribers by speed has naturally evolved towards higher speeds, particularly in the recent years following the Covid-19 pandemic, as a result of the increased availability of FTTH at affordable prices and the significant demand for higher bandwidth. Lastly, as regards advanced digital infrastructures, and given the size of the Cypriot market and consequently its production capacity, activity is only limited to the above-mentioned initiatives.

In this context, the 2023 Cyprus Digital Decade Country report recommended that *“Cyprus should accelerate its efforts on connectivity infrastructure, notably on fixed very high capacity networks. Moreover, Cyprus should regularly assess emerging market demand for the remaining unassigned spectrum in the 26GHz band in order to assign it when the demand emerges, under conditions conducive to investment.”*

2.1.2 Challenges

Challenge 1 – High Broadband pricing: High broadband pricing is considerably affected by the lack of competitiveness and infrastructure monopoly in suburban and rural areas, where alternative operators hesitate to invest because of the low population density in these areas. The country’s geographical location also affects prices, since international connectivity provided by submarine cables adds extra costs and constitutes a considerable cost component for Telecom providers. E-government, e-health and e-education services are less developed than in other EU countries, and thus provide lower incentives to citizens for ultrafast broadband use.

Challenge 2 – Technological advancements’ impact to Cyprus Economy: As depicted in the Cyprus Competitiveness Report 2021 as well as in the findings of the Cyprus Country Report 2023, technological developments, notably increasing digitalization, offers opportunities and challenges to an economy that is specialised in service industries, such as professional services, tourism, or corporate and regional headquartering. Digitalization of the economy and the availability of ICT services play a central role for competitiveness, with investments in ICT capital as a key driver of productivity growth.

Challenge 3 – Private Investments: A mapping of existing and future private investments in fixed networks was performed by the NRA (OCECPR¹⁴) in January 2022 for a timeframe of future investments until 2025. Based on the mapping for fixed networks, private investments are expected to serve areas where 90% of the population lives and cover 32% of the whole territory with services offering a download speed of at least 100Mbps, which can be readily upgradable to Gigabit. For 5G networks, private investments covered 100% of the population and roughly 94% of the territory (including major terrestrial transport paths). In planning measures to ensure investment in fixed and mobile networks consistent with Digital Decade ambitions, key challenges to be addressed include:

- Ensure that all households have access to networks capable of offering a speed of at least 100 Mbps download, which can be upgraded to Gigabit speed, up from 60% in 2022. There is an important territorial divergence between urban and rural/remote connectivity, with urban populations benefiting from private investments in broadband networks with no equivalent investment in rural areas (around 10% VHCN coverage in rural areas as opposed to 60% at national level). This results in important social divergences and exacerbated inequalities in terms of connectivity, resulting in lack of fair access to quality education, job opportunities and affordable and accessible services.

¹⁴ <https://ocecpr.ee.cy/>

- Smooth and effective deployment of 5G networks in the 700MHz and 3.6GHz bands that were assigned in December 2020, setting obligations for population coverage of 70% of the population as well as all highways by end of 2025 with speeds of at least 100Mbps).
- Ensure that 100% of the population living in organized communities (urban or rural), and all major terrestrial transport paths to have uninterrupted 5G coverage with a download speed of at least 100 Mbps.
- Assignment of the 26Ghz band of radio spectrum for 5G to support emerging technologies (such as IoT, AI) with very high speed and low latency mobile network demands.
- Ensure access to very high-capacity networks capable of offering a speed of at least 1 Gbps download and upload, in particular fibre and 5G networks, by main socio-economic drivers (such as hospitals, schools, transport hubs, public service providers, digitally intensive enterprises).
- Encourage take-up to enable the use of advanced digital services and technologies.
- Ensure affordable and resilient international backhaul connectivity for all market players.

Challenge 4 – Lack of semiconductor manufacturing industry and experts: Cyprus does not have a domestic semiconductor manufacturing industry, therefore it relies on imports for semiconductors, which can be expensive and vulnerable to supply chain disruptions. Additionally, Cyprus does not have a large pool of skilled semiconductor engineers. This can make it difficult to attract and retain the talent needed to develop and deploy semiconductor-based technologies.

Challenge 5 – Limited needs: Cyprus has a relatively small geographic area, thus its needs for edge nodes are significantly less than in larger EU Member States.

Challenge 6 – High Costs: The cost of deploying and maintaining edge nodes can be high. This can be a barrier to adoption, particularly in a small country like Cyprus. The cost of quantum computers is very high. This makes it difficult for small countries like Cyprus to invest in quantum computing.

Challenge 7 – Early development: Especially as regards quantum computer, the hardware is still in its early stages of development, thus difficult for a small country to invest in particular architecture. However, there is urgent need for developing the knowledge and upskilling the workforce to exploit quantum technologies as they mature.

2.1.3 Strengths and assets to be leveraged

Strength 1 – Political commitment for the digital transition with consolidated competencies in the DMRID: The digital transition of Cyprus is a key priority of the Cypriot Government. The decision for the establishment of the DMRID in Cyprus as the responsible authority of all digital related competencies indicates a high-level political commitment in the country as regards digital transformation and development.

Strength 2 – Service oriented economy: Cyprus is a service-oriented economy that offers services worldwide. The financial and tourism sectors are key economic sectors in Cyprus with high contribution in the overall economy. These sectors are in a phase of digital transformation and, thus, are already adopting actions towards the digital transition as well as create a demand for reliable ultra-fast broadband services.

Strength 3 – Small size of the country with close co-operation between the state and the economy: Cyprus is a relatively small country with a well-performed institutional framework and close co-operation between the central government and the economy that allow the design and implementation of horizontal policy interventions that bring immediate benefits to the society.

Strength 4 - Cyprus' key position in the South-East Mediterranean: Cyprus is located at the crossroads of Europe, Asia, and Africa, thus having a strategic position for fibre-optic submarine networks, satellite teleports and development and deployment of advanced digital technologies and infrastructures that can serve the global market.

Strength 5 – Investment-friendly environment: Cyprus is an attractive investment destination as it is among the most investment-friendly states worldwide due to its taxation system, low administrative barriers and friendly legislation.

Strength 6 – Educational System: Cyprus has a strong education system that produces high-quality graduates in engineering and physics. This provides a strong foundation for the development of a skilled workforce in the semiconductor industry. These characteristics can attract companies that engage/develop with advanced digital technologies and infrastructures.

Strength 7 - Greater Impact: Cyprus has a relatively small geographic area. This means that advanced digital technologies and infrastructures can be tested and deployed more efficiently and cost-effectively in Cyprus than in larger countries.

2.2 National trajectories and target values to contribute to the EU's connectivity KPIs

This section includes information that showcases the national trajectories and target values that EU and Cyprus have set for *KPIs 3 – Gigabit Connectivity* and *KPI 4 - Fibre to Premises*.

In the following graphs the label “dd – historical” indicates the actual progress made in EU and CY regarding the above-mentioned KPIs in recent years (wherever data was available to Cypriot Authorities). The label “dd – baseline” indicates the trajectory that the EU and CY would have followed until 2030 in the absence of the Digital Decade Programme and respective measures/actions. Lastly, the label “dd – ideal” indicates the path that EU and CY are expected to follow until 2030 in order to reach the target value, by implementing the measures and actions related to DD targets. For the case of CY the measures described also within this National Roadmap have been taken into account for the calculation of its ideal trajectory.

KPI 3 – Very High-Capacity Network (gigabit)

In this area, a rapid increase of Very High-Capacity Networks deployment is being observed in the case of CY, though currently 60% of regions have gigabit connectivity. Regarding the EU, historical data shows a slower increase. Based on the current available data it is estimated that CY will be able to reach very close to 100% (98-99%) gigabit coverage earlier than 2030, taking also into account the results of the respective RRP investments. However, the proposed 2030 target, as well as the ideal trajectory, are based on the condition that the measures presented in Section 2.3 will be implemented as planned and that the challenges identified will be addressed.

Very High-Capacity Network (gigabit)

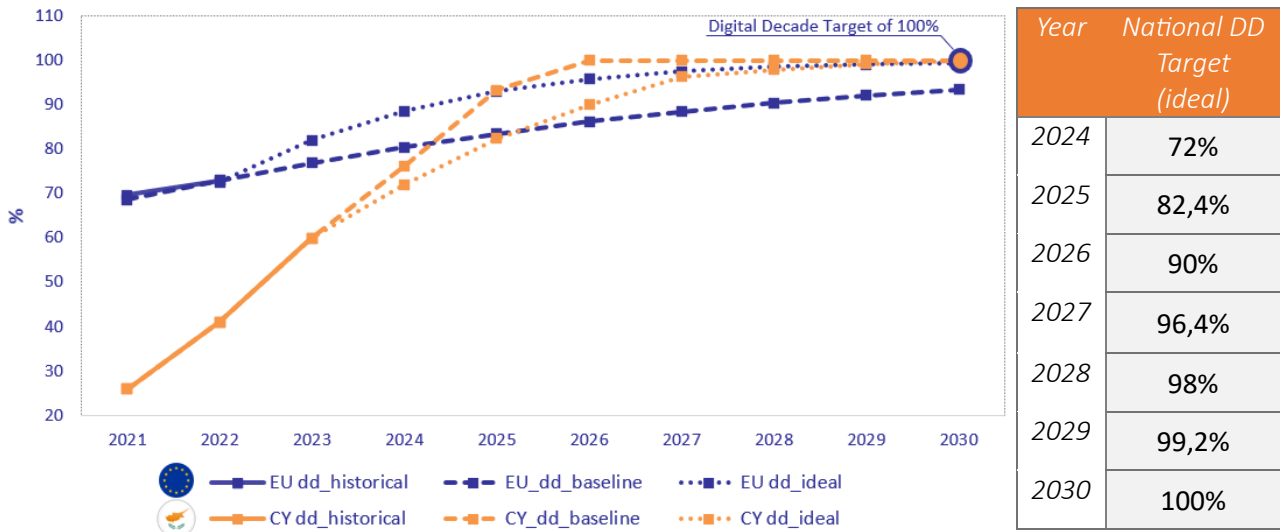


Figure 8 KPI 3 National and EU ideal and projected trajectory

KPI 4 – 5G Coverage

In this area, a rapid increase of 5G Coverage is being observed in the case of CY. Particularly, in 2023, CY has achieved to cover 100% of populated areas with 5G significantly above the EU average of 81%. Thus, projected and ideal trajectories in this case simply remain steady at 100% between years 2024- 2030.

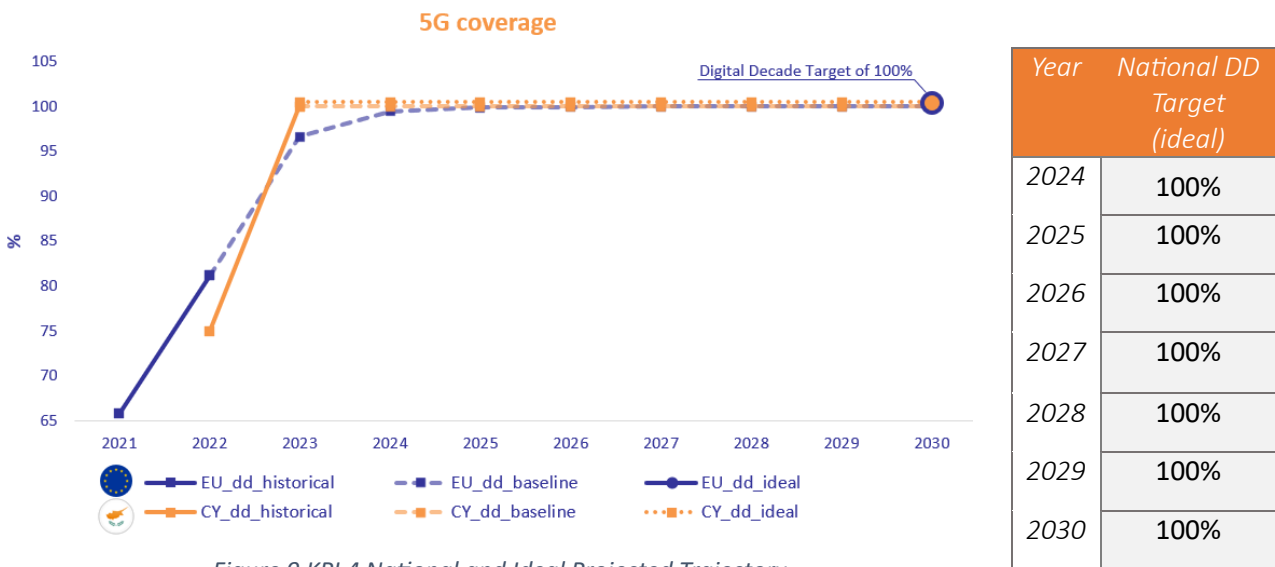


Figure 9 KPI 4 National and Ideal Projected Trajectory

KPI 5 – Fibre to Premises (FTTP)

In this area, a fast increase of Fibre-to-the premises deployment is also being observed in CY. Currently 60% of Cypriot households have FTTP, but based on the current available data it is estimated that CY will be able to reach 100% by 2030. However, the proposed 2030 target, as well as the ideal trajectory, are based on the condition that the measures presented in Section 2.3 will be implemented and that the challenges identified will be addressed.

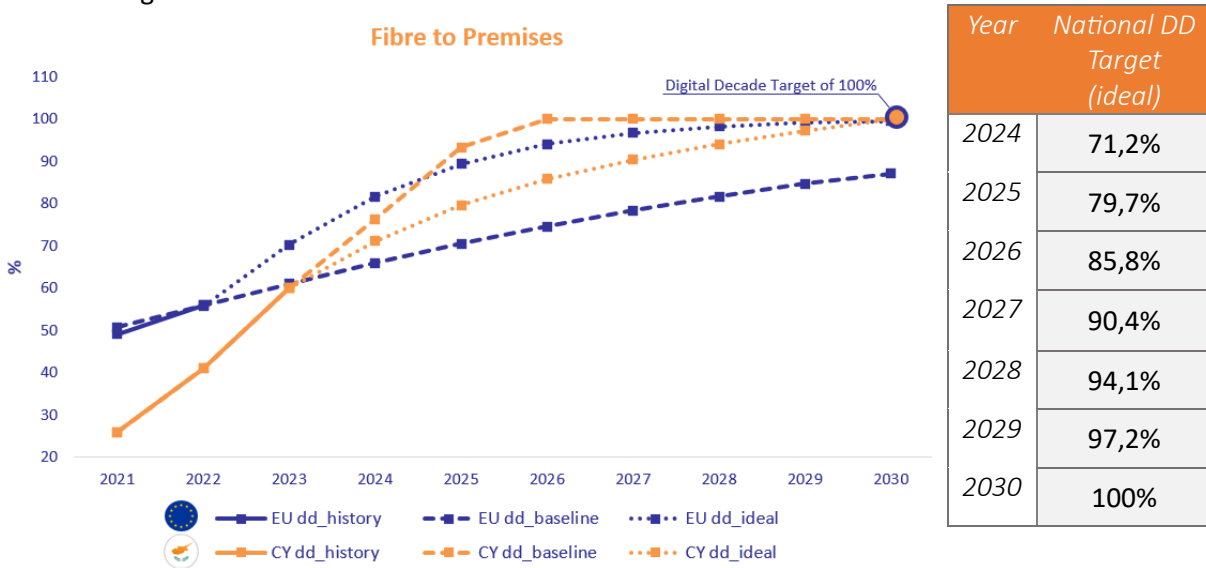


Figure 10 KPI 5 National and Ideal Projected Trajectory

2.3 Policies, measures and actions to achieve the connectivity KPIs

Digital transformation can only be fully realized if high quality access to communication networks and services is made available at affordable prices for all people and firms, no matter who they are or where they live. This involves investing in significantly upgrading communication infrastructures to address the increasing demand for data generated by the billions of devices coming online in the near future. Increasing competition and making it easier to roll out the needed infrastructure will encourage this investment. At the same time, efforts need to be made to allow all parts of society to take part in digital transformation, including rural populations currently experiencing significantly worse ultrafast broadband access.

Covid-19 has highlighted, more than ever, the crucial need for high quality digital connectivity across the country for the continuation of key activities digitally, such as remote working, healthcare and education at critical times. The pandemic widened the digital divide and has brought to the forefront important bottlenecks that need to be addressed to increase resilience and territorial and social cohesion.

According to Broadband Coverage in Europe 2022 report, coverage of 1Gbps-capable networks (FTTP & DOCSIS 3.1) in Cyprus increased substantially in 2022, reaching 60.0% of homes by mid-2022, though this represented a substantial increase from the 41.4% recorded in 2021. As there were no DOCSIS 3.1 deployments by mid-2022, gigabit-capable networks were limited to FTTP. Cyprus has had complete fixed broadband coverage at both national and rural levels since 2012 and in mid-2019 became the second country in the study to achieve universal NGA broadband coverage, having increased its VDSL reach to 100.0% of households in the preceding twelve months.

In DESI 2022, Cyprus ranks 12th amongst the 27 EU countries for connectivity. During the reporting year, Cyprus began a comprehensive roll-out of fixed and mobile networks mirrored by a significant increase in take-up of both fixed and mobile broadband, including at high speeds; and a reduction in prices. In policy developments, Cyprus adopted a new national broadband plan (NBP) 2021-2025 and transposed the European Electronic Communications Code into its domestic legislation.

The National Broadband Plan, which includes concrete measures to reach the EU's 2025 and 2030 connectivity objectives, will address both reforms and investments in line with State aid rules. The NBP provides a consistent framework of all actions to be undertaken by the public sector to facilitate private investments (including the assignment of the 26 GHz radio spectrum for 5G networks under investment-friendly conditions) as well as all public interventions in areas beyond the interest of private investors. One of the ways to help reduce the digital divide and accelerate digitalization is to spur competition between providers which in turn will lead to lower prices, making ultrafast internet more affordable for the subscribers. Therefore, the Government has to intervene to expand the ultrafast broadband coverage in areas where there are no private investments and at the same time to increase the demand (take-up) in ultrafast broadband services by applying demand side measures.

In the NBP, the government verifies its intention to continue improving coverage and take-up of VHCNs both fixed and mobile as well as establishing a legislative/regulatory framework to promote private investments while assuring a sound level of competition in the market. The NBP also includes some best practices from the Connectivity Toolbox, which are best practices developed between Member States in cooperation with the Commission with the goal to timely roll out 5G and fast broadband.

In the Country Specific Recommendations 2023, the European Commission recommends that Cyprus, during 2023 and 2024, should preserve nationally financed public investment and ensure the effective absorption of RRF grants and other EU funds, in particular to foster the green and digital transitions. Digital economy is very important for boosting productivity and economic recovery after the crisis from COVID-19. This component is in line with the country specific recommendations 2019 (CSR), which recommend focusing investment and investment-related reforms on high-capacity digital infrastructure. All proposed reforms and investments either implicitly or explicitly aim to increase investments in very high-capacity digital infrastructure, with a view to increasing coverage and take-up.

As such, dedicated reforms and investments with funds available through RRF have been included in the Cypriot Recovery and Resilience Plan (RRP), specifically under Pillar 4 aiming "Towards a digital era". These investments have been designed and started being implemented by the respective Cypriot Authorities. However, these relatively large and complex in nature investments/schemes require strong governance and continuous monitoring and management to minimize the risk of delays and to ensure the approval of the EC for the respective payment requests.

Lastly, Cyprus also supports the European Flagship "CONNECT" by improving access to very high-capacity networks and contributing to ensuring that there is the widest possible uninterrupted 5G coverage in all areas. This will foster take-up and ensure that households and enterprises alike can take advantage of the digital transformation.

2.3.1 General overview of measures per connectivity target

Based on the strengths and challenges described above, Cyprus and specifically DMRID has started implementing a series of measures aiming to bridge divides and ensure an inclusive digital transformation in all areas of Cyprus. The measures regarding empowerment of authorities related to

broadband and connectivity (i.e the NRA and BCO of Cyprus) are covering the need for enhancement and integration of information regarding connectivity.

Also, one of the ways to help reduce the digital divide and accelerate digitalisation is to spur competition between telecommunication providers which in turn will lead to lower prices, making ultrafast internet more affordable for the Cypriot subscribers. Therefore, DMRID has designed measures in order to expand the ultrafast broadband coverage in areas where there are no private investments and at the same time to increase the demand (take-up) in ultrafast broadband services by applying demand side measures.

The DMRID is expecting that the measures will positively affect the deployment of digital infrastructures both by addressing administrative barriers to investments in connectivity, streamlining permit granting procedures and fees and by generating important spill-over effects across society and the economy, providing the necessary infrastructure to handle emerging and future technologies. However, the challenges regarding the lack of semiconductor manufacturing industry and experts in Cyprus, the limited needs of the country regarding edge nodes as well as the lack of mature quantum computing technologies and applications to be implemented in the short term are almost certain to persist and additional targeted measures will have to be developed in Cyprus in the upcoming years.

The measures presented below contribute to the development of Digital Infrastructures that will support the achievement of the DD targets by 2030.

Measures that contribute to the KPI 3 and 4	2023	2024	2025	2026	2027	2028	2029	2030
Reform 1 (R1): Empower the National Regulatory Authority								
Reform 2 (R2): Empower the National Broadband Competence Office								
Investment 1 (I1): Expansion of Very High-Capacity Networks in underserved areas								
Investment 2 (I2): Enhance building cabling to be "Gigabit-ready" and promote connectivity take-up								

Measures	REFORM 1	REFORM 2	INVESTMENT 1	INVESTMENT 2
Target Impact (KPI)	3 & 4	3 & 4	3 & 4	3 & 4
Total Budget (€)	0.50M	0.50M	35M	10M
National Funds	-	-	-	-
Allocated	-	-	-	-
Planned	-	-	-	-
EU Funds	0.50M	0.50M (EU TSI)	35M	10M
Allocated	0.50M	0.50M	35M	10M

Planned	-	-	-	-
Private investment	250M euros(estimated)			
	<ul style="list-style-type: none"> • Cyta FTTP network deployment, 200M euros • Epic FTTP network deployment, 20M euros • Cablenet DOCSIS 3.1 and FTTP network deployment, 30M euros 			

Regarding the above table, private deployment of FTTP is underway by three telecoms providers: Cyta, Cablenet and Epic. Cyta has reported that they have so far connected 250.000 premises to fibre and aim to increase FTTH connectivity to 90% of premises in Cyprus by 2026. Cablenet currently makes use of a hybrid fibre-coaxial network which consists of fibre for the backhaul and complements this with DOCSIS 3.0 in the local loop. New fibre infrastructure will not substitute the existing DOCSIS 3.0 network, but will be implemented in 'greenfield' roll-out, i.e., where no infrastructure is already present. For its fibre roll-out, Epic has secured financing for 20M euros from the European Investment Bank, which will be used to increase the number of homes connected to fibre by Epic from 25.000 to 50.000. Cyta is considering phasing out its services over the existing copper network, but timing for the actual switch-off depends on when the fibre network has reached sufficient coverage. Cyta is allowed to proceed with copper switch-off three years after the public availability of its optical network in a specific area.

How and to what extent are the measures expected to address the challenges for KPI 3,4

The reforms will address:

- Enhancement and integration of information regarding:
 - existing physical infrastructure of network operators for undertakings willing to deploy very high speed broadband networks;
 - the reach of broadband networks and services which is relevant for the execution of tasks of potential stakeholders (i.e. OCECPR, Public Authorities, Electronic Communication Network Operators and end users) which at the present is limited and non-detailed;
- Slow administrative process regarding permits (particularly for the installation of base stations for radio-communications) and rights of way, hampering the speed of network deployment;
- Citizen concerns about environmental and/or health impact of infrastructure deployment (e.g. in case of 5G).

Although many actions towards these directions have already been implemented during the last years, some investment barriers remain. These barriers, as well as those indicated in the "Connectivity Toolbox," are thoroughly documented in the context of the National Broadband Plan to be addressed with priority, starting from 2021.

The proposed reforms contribute to those objectives by addressing administrative barriers to investments in connectivity, streamlining permit granting procedures and fees. The proposed investments contribute to those objectives by:

- Incentivizing investments in new or upgraded connectivity infrastructure as prerequisite for digital transition.
- Addressing the investment gap to extend very high-capacity networks beyond the areas of pure private investments to address territorial disparities, in line with state-aid rules.

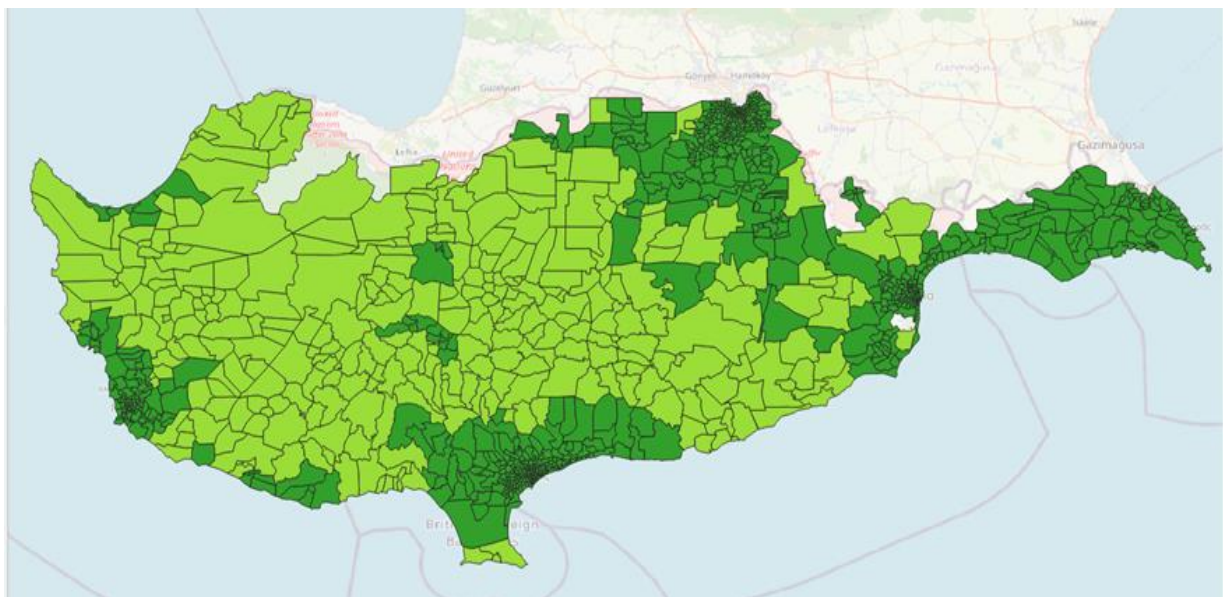
Addressing the investment gap to extend very high-capacity networks beyond the areas of pure private investments to address territorial disparities, in line with state-aid rules.

The accelerated deployment of very high-capacity networks, in particular fibre and DOCSIS 3.1 (e.g., FTTP) networks in urban and rural areas will generate important spill-over effects across society and the economy, providing the necessary infrastructure to handle emerging and future processes and applications. It will provide the industry with new opportunities, make rural areas more attractive for businesses and young generations, whilst increasing Europe's digital strategic autonomy. At the same time, it will create short-term employment and upskilling opportunities in the relevant construction and civil works sector.

Slow internet connection speeds are a key barrier to industrial digital adoption, particularly amongst SMEs. In addition to improving the performance of low-productivity businesses, digital connectivity can play a role in addressing wider societal issues, such as cutting carbon emissions by reducing the need to commute. Nationwide gigabit-capable connectivity could allow more people to work from home, giving greater flexibility in where they live. That means more people could move to suburban or rural areas, reducing pressure on transport networks and urban housing. This will help addressing the ongoing depopulation of rural communities by increasing employment opportunities, including through the introduction of ICT in agriculture, and by ensuring better access to key services such as health care.

Estimated investment gap and possible actions to reach the national target values for KPI 3, 4

The private investment plans (up to 2025) submitted to NRA during the January 2022 mapping consultation were taken into account. The map shows in dark green the areas where private investment is expected to cover the first and second target of the Broadband Plan, and with light green areas where is not intended to be covered by purely private investments. It is noted that there are sub-areas - within dark green areas - where more than one network covering the targets are to be deployed.



The Investment gap are those with light green and refer to 311 teleregions (out of 1176) and include 31,900 lines (10.3%). The premises of these areas are estimated at 45.000. Among these premises there will be around 1.400 Socioeconomic Drivers (SEDs).

The following table shows the total investment cost and total funding gap in order to reach the national targets and expected to be covered by Investment 1:

Investment 1	Units	Unit cost (€)	Total cost (M euros)	Funding gap per unit (€)	Funding gap (M Euros)
Fixed Access - premises	43.600	1.350	59	750	32.7
Gigabit connectivity for SED - entities	1.400	1.800	2.5	1.800	2.5
Total			61.5		35.2

2.3.2 Description of the measures for KPI 3, 4

Reform 1: Empower the National Regulatory Authority (OCECPR)	
New measure	NO
Short description of the measure	<p><u>Content of the measure:</u> Assist the Office of the Commissioner of Electronic Communications and Postal Regulation (OCECPR) to implement a web portal system for integrated access to geographical data related to networks roll out [2019 CSR 4]. This will empower the OCECPR in adapting policy decisions, design and implementation of more efficient regulation, understanding the level of competition and trends in the Electronic Communications market, but also the impact of imposed regulatory measures.</p> <p><u>Link to the target:</u> KPI 3,4</p> <p><u>Tentative timeline:</u> The implementation period is estimated by December 2024.</p>
Budget or other resources allocated or planned:	EU RRF (planned): 0.5M euros Human resources mobilized
Expected impact and related timing:	<p>Reform 1 aims to implement a web portal system for easy, interactive and integrated access to all relevant geographical data of electronic communication networks, according to the requirements of OCECPR and the provisions of the EU Legislative proposals.</p> <p>The potential stakeholders of this system are OCECPR, Public Authorities, Electronic Communication Network Operators and end users. It is also expected that the availability of geographical information tools will enable end-users to determine the availability of connectivity in different areas, with a level of detail which is useful to support their choice of operator or service provider according to the provisions of article 22(6) of the EEC. In addition to tasks that stem from the legislative proposals, the gathered information will also be used for high level tasks such as policy decisions, design and implementation of more efficient regulation, understanding the level of competition and trends in the Electronic Communications market, but also the impact of imposed regulatory measures.</p>

Reform 2: Empower the National Broadband Competence Office (DEC of the DMRIDP)	
New measure	NO
Short description of the measure	<p><u>Content of the measure:</u> Empower the Department of Electronic Communications (DEC) as the single point of contact for public investment and cooperation with private investors and facilitator of the necessary administrative procedures, as well</p>

	<p>as a primary contributor to the implementation of the common Union Toolbox for Connectivity.</p> <p><u>Link to the target:</u> KPI 3,4</p> <p><u>Tentative timeline:</u> The implementation period is estimated to be completed by 2024 Q2.</p>
Budget or other resources allocated or planned:	EU TSI (allocated): 0.5M euros and relevant human resources mobilized
Expected impact and related timing:	<p>The expected output of this reform is to structure and build the capacity of a new Broadband Competence Office (BCO) within the DEC, which will operate as single point of reference in the broadband sector, for public investments, cooperation with private investors and facilitator of administrative procedures.</p> <p>Consequently, after the reform, the BCO will have the capacity to ensure maximum impact of ESIF, RRF and CEF2 funding for broadband, by coordinating the public approach to address connectivity issues and tackle market failures in underserved areas. It will also be equipped to improve incentives for market operators to invest in very high-capacity networks, by addressing and challenging the effectiveness of implementation of the Broadband Cost Reduction Directive and its forthcoming review, the Connectivity Toolbox and related soft-law instruments (e.g. BEREC guidelines).</p> <p>This project was completed successfully in August 2023. As a result of the reform, two public intervention projects of total budget 45M included in the CY RRP have been matured and started being implemented.</p>

Investment 1: Expansion of Very High Capacity Networks in underserved areas	
New measure	NO
Short description of the measure	<p><u>Content of the measure:</u> The Department of Electronic Communications (DEC) of the Deputy Ministry of Research, Innovation and Digital Policy (DMRIDP) will be the implementing authority. The implementation of the project will follow a Private DBO (Design, Build and Operate) - Gap Funding model (i.e., the Contractor will undertake the design, construction and operation of the network, as well as part of the financing, and the public sector will cover the funding gap with a grant), following an open tender procedure. The geographical territory of the Republic of Cyprus will be divided (indicatively) into 3 lots. For each lot, the maximum amount of public financial contribution will be set, and awarding criteria could include the requested public support as well as the price offered to end-users and to other retail operators. Provisions will be made so as to ensure competition, for example not all lots can be awarded to only one bidder.</p> <p>The network that will be developed in each lot will concentrate the traffic from all the served locations to one (or more) central Points-of-Presence (POPs), where other retail operators can be interconnected, in order to provide services. Wholesale obligations will be imposed to the Contractor, as per the State-Aid provisions.</p>

	<p><u>Link to the target:</u> KPI 3,4</p> <p><u>Tentative timeline:</u> Q1 2024 - Q4 2025</p>
Budget or other resources allocated or planned:	<p>EU RRF (planned): 35M euros</p> <p>Human resources mobilized</p>
Expected impact and related timing:	<p>This investment is expected to close the relevant investment gap in order to reach connectivity targets for very high-capacity networks, through a public tender addressed to telecom operators, in areas of CY, where based on an NRA (OCECPR) mapping, no private interest currently exist.</p> <p>The investment will result in at least 44.000 premises covered by VHCN fixed network (upgradable to 1 Gigabit) in areas of no interest to private investors.</p>

Investment 2: Enhance building cabling to be “Gigabit-ready” and promote connectivity take-up	
New measure	NO
Short description of the measure	<p><u>Content of the measure:</u> This investment aims to encourage connection of end-users to Gigabit capable networks, deployed close to their residence, through the reduction of set-up costs and subscription fees.</p> <p><u>Link to the target:</u> KPI 3,4</p> <p><u>Tentative timeline:</u> Q1 2023 - Q2 2025</p>
Budget or other resources allocated or planned:	EU RRF (allocated): 10M euros and relevant human resources mobilized
Expected impact and related timing:	<p>The project aims to support households in getting Gigabit connections, through the reduction of the setup costs and a subsidy to cover the first 12 months of subscription. The voucher scheme will offer households, without a subscription to a connection providing at least a 100 Mbps download speed, a voucher of 120 euros to cover part of the set-up cost and the first 12 months of the monthly subscription for a connection with a download speed of at least 200 Mbps. The direct beneficiaries and end users of the scheme are households in selected areas of Cyprus. The voucher is expected to benefit approximately 82,000 households from 2023 to 2025.</p>

3. Digitalization of businesses (KPI 9, 10, 11, 12, 13)

The digital transformation of businesses will depend on their ability to adopt new technologies rapidly and across the board, including in industrial and service ecosystems that are lagging behind. This will enable more efficient resource use, boost material productivity, and reduce vulnerability to supply shocks. SMEs play a central role in this process, not only because they represent the bulk of EU companies, but also because they are a critical source of innovation. Therefore, as part of the Digital Compass, EU’s proposed level of ambition is that by 2030:

- 75% of European enterprises have taken up cloud computing services, big data, and AI **(KPIs 9, 10 & 11)**
- More than 90% of SMES have reached at least basic level of digital intensity **(KPI 12)**
- The number of European unicorns has doubled **(KPI 13)**

According to the Digital Decade Country Report 2023, the share of SMEs in Cyprus with at least a basic level of digital intensity is with 70% above the EU average of 69%. On the use of advanced digital technologies, the situation is mixed. 42% of enterprises in Cyprus used cloud services in 2021. This is 8 percentage points above the EU average of 34%, but still below the EU target of 75% for 2030. Also, only 6% of enterprises in Cyprus used big-data analysis in 2020, below the EU average of 14%, and only 3% used AI in 2021.

An overview of the current values of the KPIs related to Digitalization of businesses is presented in the figure below along with the 2030 projected values (based on historical data) and the 2030 target values.

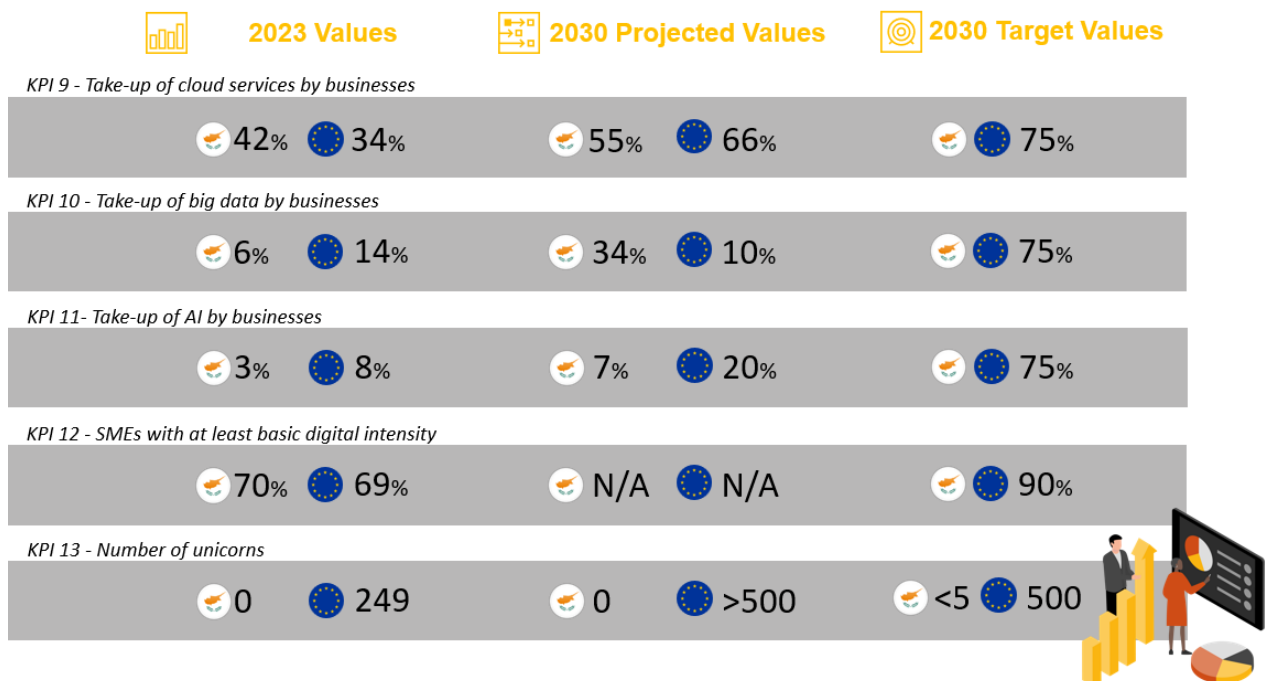


Figure 11 Digitalization of businesses KPIs

Overall, through the development and implementation of the measures and actions described in this National Roadmap, the general objectives of DMRID for the “Digitalisation of Businesses” cardinal point are:

- Explore and implement initiatives that will facilitate the spread of AI, Cloud computing and big data integration in the business world;
- Remove administrative barriers that hinder SMEs digitalisation and foster initiatives that support knowledge transfer;
- Boost digital entrepreneurship aiming to enable the creation of new digital ventures as well as a fast and smooth adoption of existing digital technologies.

3.1 Analysis of the State of play of digitalization of businesses in Cyprus

3.1.1 State of play

Business digitalization is pivotal for economic growth and success, especially in an unpredictable environment. Amidst economic fluctuations and uncertain supply chains, going digital, enhances company business strategies, boosts efficiency, strengthens resilience, and unlocks new revenue avenues, particularly for SMEs. Digitalization not only fuels growth and productivity but also enhances diversification capabilities and reduces administrative expenses.

- On the Digitalization of businesses (KPI 11), the share of SMEs in Cyprus with at least a basic level of digital intensity is at 70% which is above the EU average of 69%, making a positive contribution to the EU’s Digital Decade target of having 90% of SMEs in Europe with at least a basic level of digital intensity.
- On the use of advanced digital technologies, 42% of enterprises are using cloud services in 2021 (KPI 8), above the EU average of 34%.
- On the other hand, in 2020, a very low percentage of 6% of enterprises in Cyprus were using big-data analysis (KPI 9), below the EU average of 14% and only 3% use AI (KPI 10), below the EU average of 8%.
- The EU aims to support the growth of its innovative scale-ups and improve their access to finance, aiming to double the count of unicorns (from around 250 to more than 500).

In recent years, Cyprus businesses have proven to be faced with reduced competitiveness, mainly due to low productivity, high production costs and, in general, increased costs in the supply chain resulting from the small size of the market and the geographical and energy "isolation" of Cyprus. In terms of incorporation of digital technologies by businesses, Cyprus is making slow but steady progress. Companies use social media and e-commerce, but are less willing to adopt new technologies such as cloud computing, big data and AI.

In this context, the Cyprus Digital Decade Country report 2023 mentions that “Cyprus should accelerate its efforts in the area of digitalisation of businesses. In particular, the swift implementation of the RRP actions and the roll out of several support schemes will contribute to enhance the percentage of enterprises, which could benefit from the adoption of emerging technologies in particular big data and AI.”

From the above it is evident that, except for the adoption of cloud services, the adoption of digital technologies by companies in Cyprus is still below the Digital Decade targets and more action is required in order to ensure the achievement of DD targets.

3.1.2 Challenges

There are several reasons why the adoption of digital technologies by Cypriot companies and SMEs is still well below the European average.

Challenge 1 – Risk aversion: Cypriot companies are generally more risk averse than their European counterparts regarding digital technologies integration. This may be caused due to several factors, such as the smaller size of the Cypriot economy and the limited availability of funding for projects and activities like this.

Challenge 2 – Lack of awareness and understanding: Many Cypriot companies, especially SMEs especially very small companies (<10 employees), are not fully aware of the benefits of digital technologies and how they can be used to improve their businesses. They may also lack the understanding of how to implement and use these technologies effectively. There is also a lack of industrialists' culture to create business partnerships/clusters or joint ventures in matters of technological upgrading and digitization.

Challenge 3 – Cost and resources: Digital technologies can be expensive to implement and maintain, especially for small businesses. Cypriot companies also lack in many cases the resources, such as skilled IT staff, to implement and manage these technologies effectively.

Challenge 4 – Lack of digital skills: There is a shortage of digital skills in the Cypriot workforce. This can make it difficult for companies to find the staff they need to implement and use digital technologies effectively. The Cypriot government is aware of these challenges and is taking steps to address them. For example, the government has launched a number of initiatives to promote digital adoption among Cypriot companies, such as the Digital Skills - National Action Plan 2021-2025. The government is also working to simplify the regulatory environment and to promote investment in digital skills development.

Challenge 5 – Regulatory challenges: Cyprus needs to put in place by timely implementing the relevant EU acts (e.g., governing the use of AI and big data) a clear regulatory environment that will allow companies to adopt new technologies. For example, there is a lack of clear regulations governing the use of AI and big data.

Challenge 6 – Market Size and Dynamics: Cyprus has a relatively smaller market compared to larger European countries. Thus, companies might prioritise other areas of investment over digital technologies if they don't see an immediate need or Return on Investment (ROI).

Challenge 7 – Infrastructure: Proper digital infrastructure, including high-speed internet and data centres, is crucial for adopting technologies like cloud and big data. Any limitations in this infrastructure can be a significant barrier.

3.1.3 Strengths and assets to be leveraged

Cyprus is making progress in the digital transformation of its businesses. The Cypriot government has made digital transformation a strategic priority and has implemented several initiatives to support businesses in their digital journey. However, more needs to be done to invest in digital infrastructure, support digital skills development, and encourage digital adoption.

Strength 2 – Supporting digital skills development: The government and businesses need to continue working together to support the development of digital skills among the workforce. This will ensure that businesses have the talent they need to implement and manage digital technologies effectively. Currently, Cyprus has a high number of university graduates, however, without focus on STEM education.

Strength 3 – Encouraging digital adoption: The government and businesses need to continue working together to encourage businesses of all sizes to adopt digital technologies. This can be done through education, awareness raising, and financial incentives.

Strength 4 – Strategic location: Cyprus is strategically located at the crossroads of Europe, Asia, and Africa. This gives businesses access to a large and growing market for their digital products and services.

Strength 5 – Strong government commitment: The Cypriot government has made digital transformation a strategic priority and has implemented a number of initiatives to support businesses in their digital journey.

Strength 6 – Friendly tax regime: Cyprus has a friendly tax regime that attracts businesses of all sizes, including SMEs and startups. For example, Cyprus has a corporate tax rate of just 12.5%, which is one of the lowest in the EU. This is especially important for digital businesses, which are often highly mobile and can choose to operate from anywhere in the world.

3.2 National trajectories and target values to contribute to the EU’s digital transformation of businesses targets

This section includes information that showcases the national trajectories and target values that EU and Cyprus have set for *KPIs 8 - 11*.

In the following graphs the label “dd – historical” indicates the actual progress made in EU and CY regarding the above-mentioned KPIs in recent years (wherever data was available to Cypriot Authorities). The label “dd – baseline” indicates the trajectory that the EU and CY would have followed until 2030 in the absence of the Digital Decade Programme and respective measures/actions. Lastly, the label “dd – ideal” indicates the path that EU and CY are expected to follow until 2030 in order to reach the target value, by implementing the measures and actions related to DD targets. For the case of CY the measures described also within this National Roadmap have been taken into account for the calculation of its ideal trajectory.

KPI 9 – Cloud Computing

Currently, the percentage of enterprises that have taken-up cloud computing for their operation is 42% for CY and 34% for EU. Based on the available data, a large gap between the estimated 2030 projected value and the Digital Target set is being observed both in the case of CY and EU. In particular for the case of CY, and taking also into account the fact that CY businesses are less willing to adopt new technologies such as cloud computing, big data and AI, this gap is approximately 20%. The proposed DD 2030 target, as well as the ideal trajectory, are based on the condition that the measures presented in Section 3.3 will be implemented and that the challenges identified will be addressed.

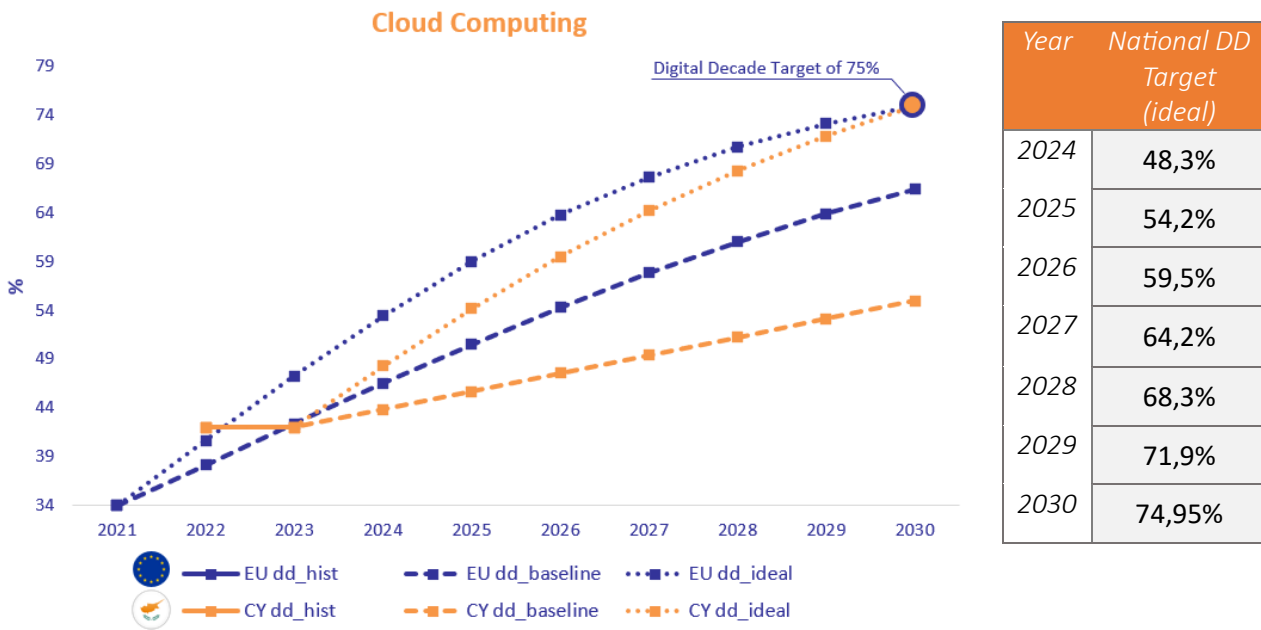


Figure 12 KPI 9 National and EU ideal and projected trajectory

KPI 10 – Big Data

Based on the available historical data, the progress in this area is limited, while currently the percentage of enterprises that have taken-up Big Data for their operation is very low (only 6% for CY and 14% for EU). In the graph below, a large gap between the estimated 2030 projected value and the DD 2030 Target set is being observed both in the case of CY and EU. In particular for the case of CY, and taking into account the fact that CY businesses are less willing to adopt new technologies such as cloud computing, big data and AI, this gap is approximately 60%. The proposed DD 2030 target, as well as the ideal trajectory, are based on the condition that the measures presented in Section 3.3 will be implemented and that the challenges identified will be addressed.

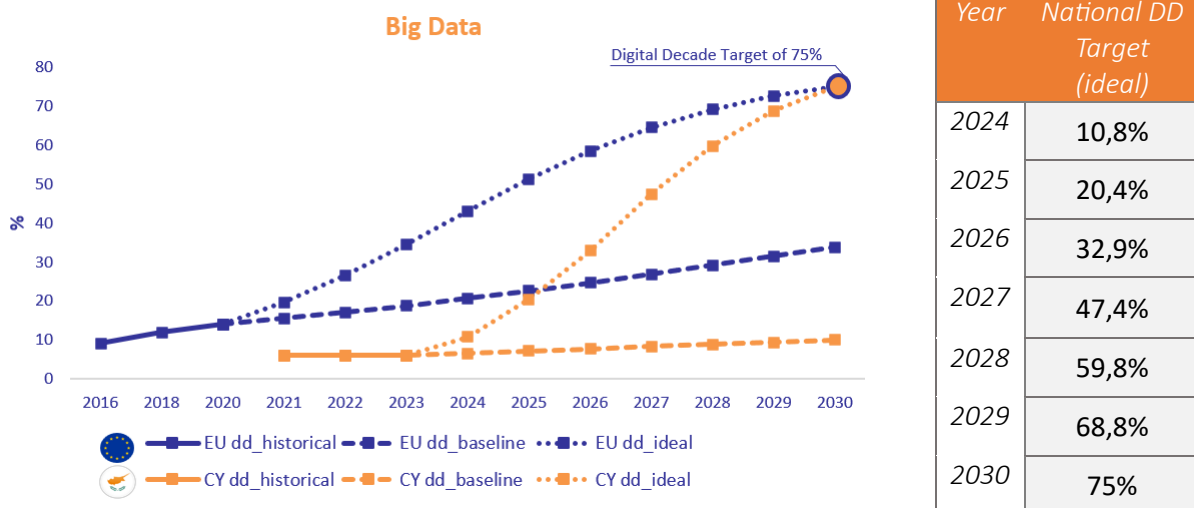


Figure 13 KPI 10 National and EU ideal and projected trajectory

KPI 11 – Artificial Intelligence

In this area, a very low percentage of businesses that have intergraded AI is being observed both in CY and EU. Regarding both cases, there is also very limited historical data availability for the KPI, since the AI area is a relatively new. Under current conditions, the percentage of CY businesses that would have taken-up AI would be close to 10% by 2030. The resulting difference between the estimated 2030 value and the Digital Target set is 65% in the case of CY. The proposed 2023 target, as well as the ideal trajectory, are based on the condition that the measures presented in Section 3.3 will be implemented and that the challenges identified will be addressed.

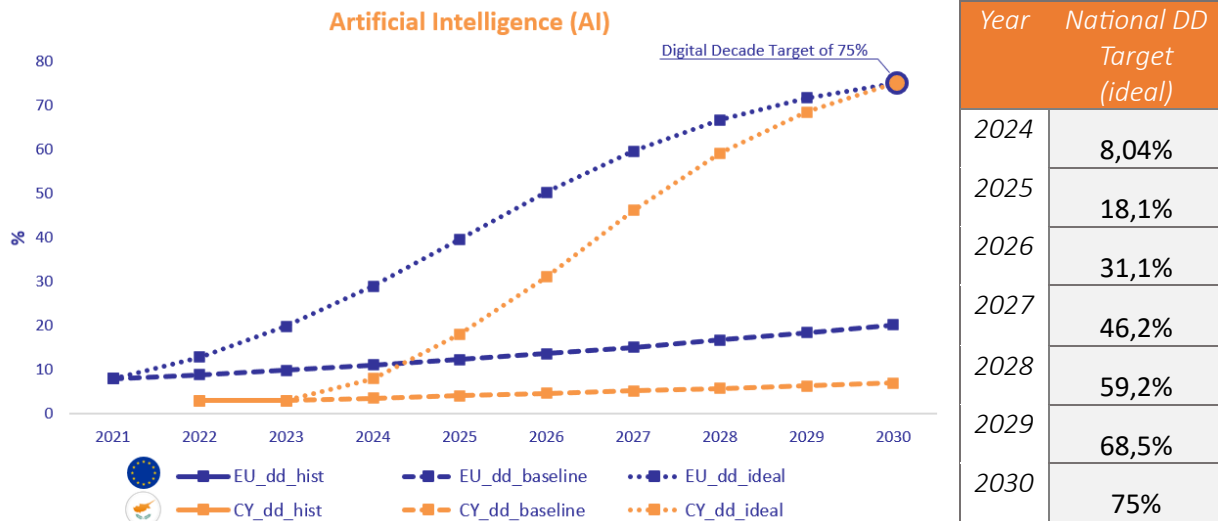


Figure 14 KPI 11 National and EU ideal and projected trajectory

KPI 12 – SMEs Basic Digital Intensity

Currently, the percentage of SMEs with basic digital intensity is 70% for CY and 69% for EU. The proposed 2023 target, as well as the ideal trajectory, are based on the condition that the measures presented in Section 3.3 will be implemented and that the challenges identified will be addressed.

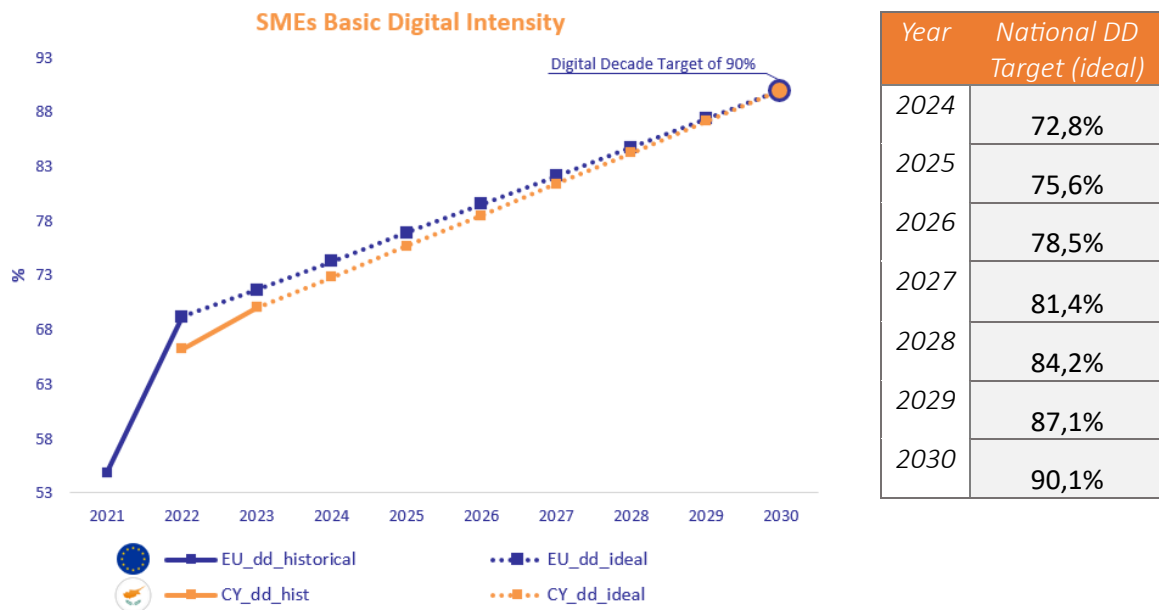


Figure 15 KPI 12 National and EU ideal trajectory

3.3 Policies, measures and actions to achieve the digital transformation of businesses targets

3.3.1 General overview of measures

Based on the strengths and challenges described above, Cyprus and specifically DMRID has invested on the development of two complementary strategies which will create the framework and will guide Cyprus’ private sector to a smooth digitalisation process while showcasing the strong political commitment to the digital technologies’ adoption. In addition, specific measures regarding facilitating Cypriot businesses’ digital transition and sharing of knowledge about AI, Cloud computing and big data have also been designed to increase the uptake of emerging technologies in Cypriot enterprises. These measures are expected to effectively address the lack of awareness and understanding by Cypriot companies and especially SMEs.

Regarding cost and resources challenge, the measures implemented are providing grants thus encouraging investments in digital entrepreneurship. Also, taking into account the developing legal framework challenge, Cyprus is examining the establishment of Units/Sectors within or under the Deputy Ministry of Research Innovation and Digital Policy, that will oversee the implementation monitoring and enforcement of Data Governance and AI Acts, therefore providing for a clear regulatory environment regarding these new technologies.

The DMRID is expecting that the measures will have several positive impacts on facilitating the digitalisation of businesses in Cyprus overall.

Measures	2023	2024	2025	2026	2027	2028	2029	2030
Measures that contribute to the KPI 8-12								
Measure 1: National Digital Strategy 2020-2025								
Measure 2: New Cyprus Industrial Strategy Policy 2022								
Measure 3: Current and Future (tbd) funding programmes for facilitating Cypriot businesses’ digital transition.								
Measure 4: European Digital Innovation Hub (EDIH)								
Measure 5: Knowledge Transfer and Innovation Initiative								
Measure 6: Establishment of a Data Policy Unit/Sector								
Measure 7: Establishment of an AI Unit/Sector								
Measure 8: Participation in multi-county projects in AI and Blockchain through EDICs								

Budget of all the measures that can be attributed to KPI 8-12

Measures	1	2	3	4	5	6	7	8
Target Impact (KPI)	8-12	8-12	8-12	8-12	8-12	8-12	8-12	8-12
Total Budget (€)	tbd	tbd	30M	5.2M	3M	tbd	tbd	tbd
National Funds	-	-	-	1.3M	-	-	-	-
Allocated	-	-	-	-	-	-	-	-
Planned	-	-	-	-	-	-	-	-
Eu Funds			30m	3.9m	3m			
Allocated	-	-	-	-	-	-	-	-
Planned	-	-	-	-	-	-	-	-

3.3.2 Description of the measures

Measure 1: National Digital Strategy 2020-2025	
New measure	NO
Short description of the measure	<p><u>Content of the measure:</u> The Cypriot National Digital Strategy 2020-2025 is a comprehensive plan to accelerate the digital transformation of Cyprus. The implementation of the National Digital Strategy 2020-2025 is expected to have several positive impacts on the Cypriot economy and society. The strategy is expected to boost economic growth, create jobs, and improve the quality of life for all Cypriots. The strategy sets out several targets and actions to be achieved by 2025, including:</p> <ol style="list-style-type: none"> 1. Technology that works for people: <ul style="list-style-type: none"> - Increase the percentage of businesses that use e-commerce to 80% by 2025 - Increase the number of digital startups by 50% by 2025 - Increase the percentage of businesses that use cloud computing to 60% by 2025 - Introduce a new law that makes it easier for businesses to operate online 2. A vibrant, sustainable and resilient digital economy: <ul style="list-style-type: none"> - Establish a digital transformation fund - Create a digital innovation centre - Partner with the private sector to develop and implement digital transformation initiatives 3. An open, democratic and inclusive digital society: <ul style="list-style-type: none"> - Increase the percentage of the population with digital skills to 80% by 2025 - Develop and implement a national cybersecurity strategy - Promote digital literacy and inclusion 4. A green, digital transition for Cyprus: <ul style="list-style-type: none"> - Reduce the environmental impact of the digital sector by 20% by 2025 - Promote the use of digital technologies to support sustainable development <p><u>Link to the target:</u> The Cypriot National Digital Strategy 2020-2025: This strategy sets out several targets and actions to promote the digital transformation of Cyprus, including businesses. Some of the key targets include:</p>

	<ul style="list-style-type: none"> - Increasing the percentage of businesses that use e-commerce to 80% by 2025 - Increasing the number of digital startups by 50% by 2025 - Increasing the percentage of businesses that use cloud computing to 60% by 2025 <p>The government of Cyprus is committed to implementing the National Digital Strategy 2020-2025, and it has already begun to make progress on several targets and actions. For example, the government has launched the Digital Transformation Scheme for Companies, which provides grants to businesses to invest in digital technologies and services. The government has also established a digital innovation hub (measure 3) and partnered with the private sector to develop and implement digital transformation initiatives.</p> <p><u>Tentative timeline:</u> The initiative will run from 2020 until 2025.</p>
Budget and other resources allocated or planned:	N/A
Impact	By 2025, the proper implementation of CY Digital Strategy in cooperation with the relevant measures that stem from it and have been included in the CY RRP, will result in boosting the digital transformation of the public and private sector and promote innovation in line with the Country's level of digital maturity.

Measure 2: New Cyprus Industrial Strategy Policy 2022	
New measure	NO
Short description of the measure	<p><u>Content of the measure:</u></p> <p>In 2022, Cyprus put forward initiatives for increasing the uptake of emerging technologies in enterprises in line with the New Cyprus Industrial Strategy Policy 2022 and the objectives set up in the RRP. Subsidy schemes have been launched to support the SMEs' digital transition and innovative start-ups. In addition, Cyprus aims to increase the adoption rate of digital production systems and applications and encourage the setting-up of smart factories and the use of cutting-edge and emerging technologies and digital services infrastructures, thus reinforcing the country's transition to Industry 4.0.</p> <p><u>Link to the target:</u></p> <p>The New Industrial Policy 2022 of the Ministry of Energy, Trade and Industry, aims to re-launch of the Cypriot economy through the promotion and strengthening of industrial production and investment, as part of the strategic framework for a sustainable economic growth model, based on the regeneration of existing industrial sectors and the development of new sectors and technologies through the promotion of research, technological development and innovation.</p> <p><u>Tentative timeline:</u> 2022-2030</p>
Budget and other resources allocated or planned:	To be determined through the various actions over the years to come
Expected impact:	With an Horizon until 2030, the Cyprus industrial strategy will provide the strategic framework and relevant priorities guiding the digitalisation of businesses and the industry related sector in general, not only through promoting the adoption of digital production systems and applications, modern equipment and state-of-the-art technologies, but also through the creation of smart factories and digital service infrastructures.

Measure 3: Current and Future (tbd) funding programmes for facilitating Cypriot businesses' digital transition.	
New measure	NO
Short description of the measure	<p><u>Content of the measure:</u> In 2022, the Ministry of Energy, Commerce and Industry launched several funding programmes for facilitating businesses' digital transition. One of these programmes is the 'Digital Upgrade of Enterprises' part of 2021-2027 THALIA programme, with a total budget of 20M euros. In November 2022, a first call for proposals was launched (budget 10M euros) aimed at encouraging investments in digital entrepreneurship and strengthening the integration of digital technologies by businesses. The second call was launched in March 2023 (with an additional RPP budget of 10M euros) and a third call is scheduled for the third quarter of 2024. In total, the funding programme will make 30M euros available. The first call resulted in awareness-raising activities, a landscaping of the digital roadmap, and activities to facilitate and promote SMEs' investment in digital transformation. The programme is open to existing SMEs wanting to invest in digital upgrading (including e-commerce) and new SMEs planning to invest in e-commerce or on-line store or the application of advanced digital technologies.</p> <p><u>Link to the target:</u> 'Digital Upgrade of Enterprises' part of 2021-2027 THALIA funding programme with a total budget of 30M euros</p> <ul style="list-style-type: none"> • first call was launched November 2022 with a budget of 10M euros • second call was launched March 2023 with a budget of 10M euros • third call is scheduled for the Q3 2024 with a budget of 10M euros <p><u>Tentative timeline:</u> 2022-2030</p>
Budget and other resources allocated or planned:	The 'Digital Upgrade of Enterprises' part of 2021-2027 THALIA funding programme has a total budget of 30M euros
Impact	<p>With a medium-term horizon until 2030, current and future funding programmes like THALIA are expected to contribute to the digital transformation of the Cypriot economy by boosting digital entrepreneurship and integration of advanced digital technologies like artificial intelligence (AI), Blockchain, cloud computing and big data.</p> <p>Their immediate results will include an increase in the number /percentage of SMEs that use ICT, including e-commerce, thus strengthening the digital identity of businesses. An indirect result of them is the creation of new opportunities for further expansion of businesses through digital transformation.</p>

Measure 4: European Digital Innovation Hub (EDIH)	
New measure	NO
Short description of the measure	<p><u>Content of the measure:</u> In June 2022, the 'Cyprus DIGital INNovation Hub' (DiGiNN) was selected for funding as a European Digital Innovation Hub (EDIH). DiGiNN is a strategic partnership in the fields of high technology, research, and entrepreneurship. Coordinated by the Cyprus Institute (Cyl),</p>

	<p>DiGiNN is to act as a national one-stop shop to accelerate the broad uptake of digital skills and technologies and support the digital transformation of SMEs and the public sector.</p> <p>DiGiNN will act as a coordinated group of 11 organisations from academia, research, business and the technology industry. The parties will be working in synergy and complementing each other for the provision of integrated services covering the entire value chain of innovation.</p> <p>Some high level objectives of the measure include:</p> <ul style="list-style-type: none"> - Increase the SMEs’ digital maturity - Innovations with high market creation potential - Mobilisation of investment for digital transformation projects - More market-ready innovations - Increase in the uptake of advanced digital technologies by SMEs - Making the public administration a catalyst for elevating productivity and competitiveness <p><u>Link to the target:</u> The DiGiNN will cover a variety of areas including High-Performance Computing (HPC), AI, big data, cloud, the Internet of Things (IoT), blockchain, digital twins, sustainability and digital skills.</p> <p><u>Tentative timeline:</u> 2022-2030</p>
Budget and other resources allocated or planned:	Establishment of Cyprus DIGital INNOvation Hub’ (DiGiNN) with a total budget of 5.195.091 euros of which 25% is nationally funded
Expected Impact:	The DiGiNN Cyprus is to offer a rounded package of AI, cybersecurity and HPC services raising awareness and providing Cypriot businesses an end-to-end experience in their digitisation journey; from coaching and mentoring by reputable experts, access to the most advanced infrastructure and facilities, support to find investments, to networking and access to innovation ecosystems. This measure is therefore expected to help addressing the lack of understanding and awareness of the benefits of digital technologies and how they can be used to improve the businesses, which has been identified as a current challenge in the Cypriot Business and SMEs ecosystem.

Measure 5: Knowledge Transfer and Innovation Initiative	
New measure	NO
Short description of the measure	<p><u>Content of the measure:</u> In 2022, Cyprus and the Research and Innovation Foundation (RIF) launched the Knowledge Transfer and Innovation Initiative. The initiative has two objectives: (i) to develop an ecosystem of trainings and capacity building for moving research inventions, knowledge, and know-how into industry; and (ii) to support the transfer of specific inventions and innovations from research organisations to companies for the development of new products and services.</p> <p><u>Link to the target:</u> Through this initiative, Cyprus aims to encourage innovative behaviour of businesses, and to increase the uptake of innovative technologies by them. A total of 3M euros will be allocated</p>

	<p>to companies via the related RRP investment in ‘Enhanced R&I’. The RIF also rolled out other initiatives:</p> <ul style="list-style-type: none"> i. INNOVATIVE targets SMEs and large companies to help them growth and to provide funding for R&I investment and the development of competitive innovative products or services with quick global market penetration prospects; ii. DISRUPT targets all companies regardless of size to help them scale-up by adopting cutting-edge ideas and technologies. <p><u>Tentative timeline:</u> 2022-2030</p>
Budget and other resources allocated or planned:	Launch of the Knowledge Transfer and Innovation Initiative with a total budget of 3M euros
Impact	Significant contribution to the digital transformation of Cypriot businesses until 2030

Measure 6: Establishment of a Data Policy Unit/Sector	
New measure	YES
Short description of the measure	<p><u>Content of the measure:</u> Cyprus currently examines the establishment of a Data Policy Unit/Sector within or under the Deputy Ministry of Research Innovation and Digital Policy, that will oversee the implementation monitoring and enforcement of Data Governance Act, Data Act and the existing Open Data Directive (currently under the authority of another governmental body).</p> <p><u>Link to the target:</u> The Data Governance Act introduces regulations that foster a positive environment for data by emphasizing voluntary sharing, enhancing trust in data interactions, increasing its availability, and addressing technical challenges for its reuse. The Data Act builds on this by specifying legal access and usage of data, paving the way for a unified European data marketplace. Open Data Directive already contributes to the reuse of open data that helps the growth of the European economy, the development of artificial intelligence and to aid work to overcome societal challenges. Moreover, the creation of Common European data spaces in strategic economic sectors, such as health, agriculture, energy, transport and environment, will ensure that more data becomes available for use in the economy and society, while keeping the companies and individuals who generate the data in control.</p> <p><u>Tentative timeline:</u> 2024/2025 to 2030 and beyond (establishment of a permanent structure)</p>
Budget and other resources allocated or planned:	Budget and Human resources to be defined
Impact	The establishment of the Data Policy Unit/Sector within or under DMRID will suggest a focused approach to managing and shaping data related policies in Cyprus. The unit is expected (if created) to play an important role in developing and implementing strategies for data governance, privacy and security. Its impact will also include guiding Cypriot Businesses to comply and gain maximum benefits from the EU Data Governance Act and Open Data Directive.

Measure 7: Establishment of an AI Unit/Sector	
New measure	YES
Short description of the measure	<p><u>Content of the measure:</u> Cyprus currently examines the establishment of an AI Policy Unit/Sector within or under the Deputy Ministry of Research Innovation and Digital Policy, that will oversee the AI national strategy aiming at increasing the use of AI by Business and Public Sector and the implementation, monitoring and enforcement of AI Act.</p> <p><u>Link to the target:</u> The EU's AI Act introduces a comprehensive regulatory framework for AI, classifying systems based on risk. Businesses face stricter regulations for high-risk AI applications, requiring conformity assessments before market entry. Emphasizing transparency, the Act mandates that AI interactions be identifiable and traceable, impacting AI-driven customer engagements. While the Act may increase operational costs due to compliance, it offers a standardized AI ecosystem, potentially boosting trust and AI adoption by businesses. AI, with its ability to process vast amounts of data, it's able to boost key performance metrics in businesses such as revenue, productivity, business growth, digital transformation and efficiency. AI can help businesses to automate routine tasks, freeing up employees to focus on more creative and strategic work.</p> <p><u>Tentative timeline:</u> 2024/2025 to 2030 and beyond (establishment of a permanent structure)</p>
Budget and other resources allocated or planned:	Budget and Human resources to be defined
Impact	The establishment of the AI Unit/Sector within DMRID signifies a dedicated effort toward advancing artificial intelligence initiatives and technology in Cyprus. This unit is expected (if created) to have a substantial impact in CY Businesses digitalisation by driving innovation, shaping AI policies and strategies and fostering strategic collaborations.

Measure 8: Participation in multi-county projects in AI and Blockchain through EDICs	
New measure	YES
Short description of the measure	<p><u>Content of the measure:</u> European Digital Infrastructure Consortium (EDICs) represents a key instrument for public authorities to collaborate for the development of innovative and interoperable digital solutions. EDICs will contribute to the deployment of joint infrastructures, the delivery of services and will bring together public entities, private entities, final users and industry. They would allow to gather essential resources such as toolkits, dataspace, and project groups which will become available and reusable among public authorities in Europe.</p> <p>Cyprus expects to benefit, by, inter alia, improving its cooperation with other MS and reinforcing its competitiveness in advanced digital technologies, by developing robust infrastructure and services that are essential for economic recovery and growth, by addressing strategic challenges in order to enhance its resilience and overall by contributing to an inclusive and sustainable digital transformation of its economy and society that benefits its citizens and businesses, with special focus in SMEs.</p> <p><u>Link to the target:</u></p>

	<p>Cyprus, responding to the call of European Commission, expressed interest to participate, inter alia, to a AI and Machine Learning (ML) and a Blockchain multi country projects and is already collaborating with other interested Member States in exploring the possibility to set up EDICs on these areas.</p> <p><u>Tentative timeline:</u> 2024/2025 to 2030 and beyond (establishment of EDICs)</p>
<p>Budget and other resources allocated or planned:</p>	<p>Budget to be defined following the establishing EDICs, the final decision for Cyprus' participation and the definition of annual participation fees for the participating Member States (MS).</p>
<p>Expected Impact:</p>	<p>The participation of CY in multi-county projects in AI and Blockchain through EDICs is expected to have a significant contribution to the digital transformation of Cypriot businesses, mainly through promoting collaboration and sharing of best practices and knowledge. The EDIC's are also expected to facilitate the integration of Cypriot Businesses into the broader European Digital landscape.</p>

4. Digitalization of public services (KPI 14, 15, 16, 17)

As EU's needs to leverage digitalization is becoming more essential, online accessibility of public services under fair and non-discriminatory conditions for all citizens and businesses is becoming crucial. The use of user-friendly online tools adhering to robust security and privacy standards is a growing need in all EU Member states. In addition. The concept of "government as a Platform", a new holistic way of building digital public services, should ensure interoperability across all levels of government. Therefore, as part of the Digital Compass, EU's proposed level of ambition is that by 2030:

- there is 100 % online accessible provision of key public services and, where relevant, it is possible for citizens and businesses in the Union to interact online with public administrations **(KPI 14 & KPI 15)**
- 100 % of Union citizens have access to their electronic health records **(KPI 16)**
- 100 % of Union citizens have access to secure electronic identification (eID) means that are recognised throughout the Union, enabling them to have full control over identity transactions and shared personal data **(KPI 17).**

An overview of the current values of the KPIs related to Digitalization of Public Services is presented in the figure below along with the 2030 projected values (based on historical data) and the 2030 target values.

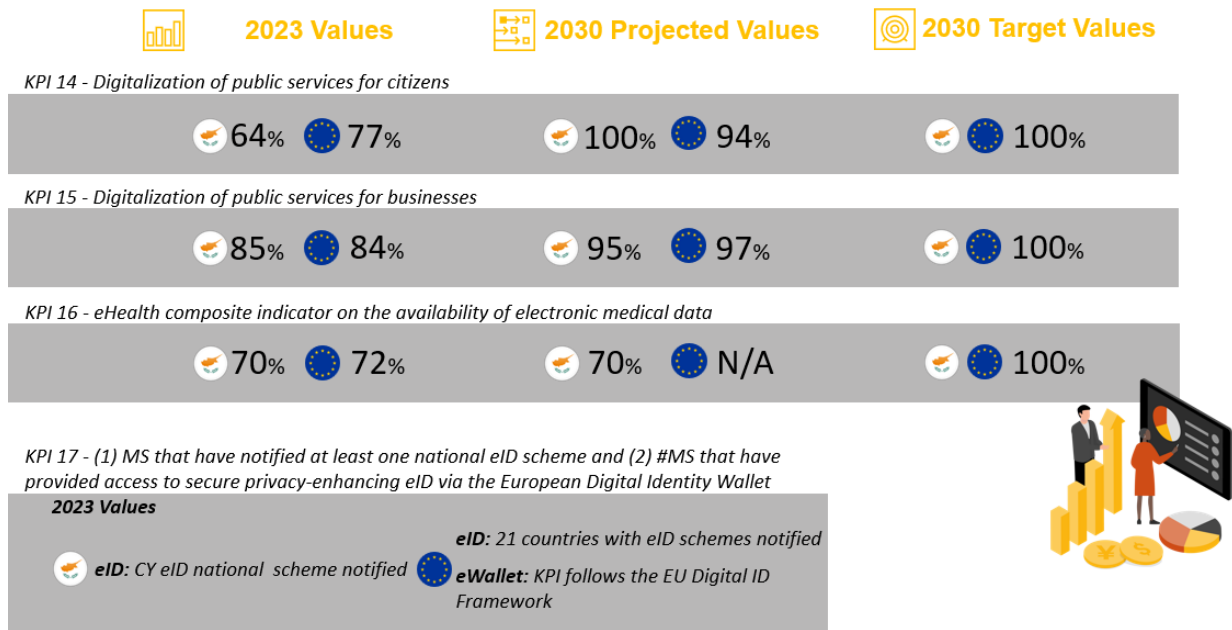


Figure 16 Digitalization of Public Services KPIs

Overall, through the development and implementation of the measures and actions described in this National Roadmap, the general objectives of DMRID for the "Digitalisation of Public Services" cardinal point are:

- Foster the creation of a government that is digital to its core, uses its data effectively, adopts new and existing technologies and drives the efforts to digitalisation of Cypriot economy;
- Promote “government as a platform” concept supporting and facilitating digital exchanges and transactions of its citizens and businesses;
- Ensure resilience and robustness of critical government infrastructure and main IT systems.

4.1 Analysis of the State of play of digitalization of public services in Cyprus

4.1.1 State of play

According to Cyprus 2023 Digital Decade Country Report, Cyprus has been consistent in the recent years in taking the required measures to improve the provision of digital public services. The latest Cyprus Competitiveness report mentions that¹⁵, the country has improved its performance in eGovernment development, since 2018. At that time, Cyprus ranked much lower in the rankings of both dimensions examined by the United Nations E-Government index¹⁶ (eGovernment and e-Participation).

Additionally, the recent experience of COVID-19 pandemic has demonstrated that Cyprus has great potential to transform and grow through digitalisation. During the pandemic outbreak, the Cypriot authorities moved with unprecedented agility and speed, under pressing timeframes, to meet the needs dictated by the “new normal” of lockdowns and social distancing through digitalising services. This proved Cyprus’ digital transformation potential and its ability to embody the ethos of the digital era.

In this direction, Cyprus has untapped potential to contribute further to the collective efforts to achieve the EU’s Digital Decade targets and therefore DMRID focus its efforts in the following areas:

Rebuilding Government IT Infrastructure including:

- Building a solid, integrated and modern government digital architecture blueprint and standards (key for the digital transformation of the government entities and the way they operate),
- integration of the various public sector information systems and databases to ensure adherence to the once-only principle and to provide efficient and secure digital public services that will make citizens and businesses lives easier, redesign of the single government website portal,
- establishment of a government cloud to consolidate systems and data scattered across government IT systems and implement a “cloud first” migration strategy, and adoption of an as-a-service (AAS) model - Infrastructure as a Service, Platform as a -) across government to ensure that the public sector can refresh their IT systems more quickly and upgrade to new technologies more easily.

Building a “Digital Services Factory” capable of delivering standardised end-to-end digital micro services that will meet citizen’s needs by:

- adopting a model to ensure the rapid implementation of services using Agile/Scrum methodologies,

¹⁵ Cyprus Economy and Competitiveness Council, https://economy-finance.ec.europa.eu/system/files/2022-03/2021_cyprus_competitiveness_report.pdf

¹⁶ UN, <https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/44-Cyprus/dataYear/2022>

- supported further by the development of strong governance mechanisms to safeguard the sustainable deployment of services.

Improving delivery, maintenance and operating model of large-scale IT projects including the redesign of the lengthy procurement processes currently in place (reduction in project life cycle from 7-10 years to 2-3 years). Reorganising institutional structures, operating models, roles and responsibilities, processes, skills (upskilling and certification) and competencies, human capital and performance management to support the operation of the DMRID in an effective and efficient manner. During the reform and reorganisation phase, bridging the gap (skillset and human resources) through the acquisition of services from the private sector (Enterprise Architect, Cloud Architect, data Architect etc). In parallel, there will be on going and on the job training of DMRID staff to acquire the necessary competences in house.

According to the Digital Decade Country Report 2023, in the Digitalization of public services sector, the level of online interaction between public authorities and the general public is very high, with 99% of internet users actively engaging in the use of e-government services, well above the EU average of 74%. On pre-filled forms, Cyprus underperforms with a score of 49, still below the EU average of 68 but significantly up on the 2021 figure. On transparency of service delivery design and handling of personal data, Cyprus scores below the EU average (32 against 65 for the EU). On user support, Cyprus performs close to the EU average (82 against 84 for the EU). The public services provided online by the Cypriot authorities are mobile friendly, but there is still room for improvement (83 against 93 in the EU). Cyprus scores below the EU average on digital public services provided to citizens (64 versus 77 in the EU). On the other hand, Cyprus performs well and slightly above the EU average on digital public services for businesses, scoring 85 against the EU average of 84, making a significant contribution to reaching the Digital Decade target.

In respect to interoperability, Cyprus' results show an overall good implementation of the European Interoperability Framework (EIF) Principles, scoring above the European average for Multilingualism and Assessment of Effectiveness and Efficiency. However, areas of improvement are concentrated in Transparency and Administrative simplification, whose score goes below the EU average. More specifically, Cyprus should further ensure internal visibility and provide external interfaces for European public services as well as put more emphasis on simplifying processes and using digital channels whenever appropriate for the delivery of European public services, to respond promptly and with high quality to users' requests and reduce the administrative burden on public administrations, businesses, and citizens.

The Cypriot results for the implementation of interoperability layers show an overall good performance in line with the European average, except for the recommendations related to the area of legal interoperability. To further enhance Cyprus' score in this area, Cyprus should put in place 'interoperability checks' when it introduces new legislation to identify any barriers to interoperability. In addition, when drafting a new legislation, it should seek to make it consistent with relevant legislation, perform a 'digital check' and consider data protection requirements.

Furthermore, Cyprus shows an overall good performance in the implementation of all recommendations, aligned with the European average, except for the area related to the conceptual model itself. This is due to a lack of data on the presence or not of a common scheme for the interconnection of service components and the necessary infrastructure for establishing and maintaining European public services. Some areas of improvement have also been identified. Cyprus should, for example, where useful and feasible to do so, further use external information sources and

services while developing European public services as well as use trust services according to the Regulation on eID and Trust Services as mechanisms that ensure secure and protected data exchange in public services.

Finally, the results of Cyprus concerning Cross-border Interoperability show an at least upper-middle performance of the country. However, Cyprus has still margin for improvement in relation to three indicators where the country obtains a low performance. For instance, efforts could focus on the simplification of processes and use digital channels whenever appropriate for the delivery of European public services, to respond promptly and with high quality to users' requests and reduce the administrative burden on public administrations, businesses and citizens and on the development of a shared infrastructure of reusable services and information sources that can be used by all public administrations.

Based on all the above, 2023 Digital Decade Country Report recommends that "Cyprus should accelerate its efforts to digitalise public services. In particular, it should take measures that further improve the interoperability, effectiveness, and availability of online public services."

Digital in Cyprus Recover and Resilience Facility (RRF)

The DMRID has submitted a comprehensive plan for reforms and investments in digital transformation of the government amounting to a total of 136M euros. Proposals in the areas of research and innovation have also been included.

Total investments in the digital transformation of the government amounting to a total of 350M euros (state budget, RRF, structural funds)

4.1.2 Challenges

The context in which the state of e-government in the public sector has been developed so far consists of various challenges and impediments which are described below:

Challenge 1 – Service Delivery Model: The Cypriot government was implementing a digitisation-focused approach to digital transformation, that is improving operational efficiency by digitising paper-based government processes without considering the modernisation and optimisation of existing service models for the digital era i.e., their digitalization, hence resulting in digital government services which were not embraced by the public, and also caused issues of vendor lock-in.

Challenge 2 – E-government projects implementation and IT systems: Public procurement philosophy does not focus on value and benefits assessment and is time consuming. Stumbling blocks of faster digital enablement consist of vendor lock-in, lack of agility, substantial investments in systems that have now become legacy, very long project life cycle (almost 7-10 years from the starting date until the full implementation of the project) and low interoperability of government ICT.

Challenge 3 – Lack of skilled resources: The poor or inappropriate allocation of resources and the lack of specialist skillsets and experience within the government. It also prevented the government from identifying its overall deficiencies and expanding its resource pool with domain-specific competencies in areas such as portfolio/program/project management, cyber security, data analytics, DevSecOps, change management and others that are crucial to digital transformation.

4.1.3 *Strengths and assets to be leveraged*

Strength 1 – Greater Impact: Based on our small geographical footprint as a country (in comparison to other EU member states), targeted and specific designed actions and measures, are expected to have a greater impact and effect on the achievement of the strategic goals set on a national level.

Strength 2 – Whole-government approach: having one single authority with horizontal responsibility, establishing an efficient collaboration with the private sector: one national coordinator (DMRID), follows up the implementation of the National strategy with a Governance committee including private sector. Cyprus has successfully designed and implemented this multi-stakeholder approach, where all parties join forces efficiently and in harmony to achieve common objectives.

4.2 National trajectories and target values to contribute to the EU’s digitalization of public services

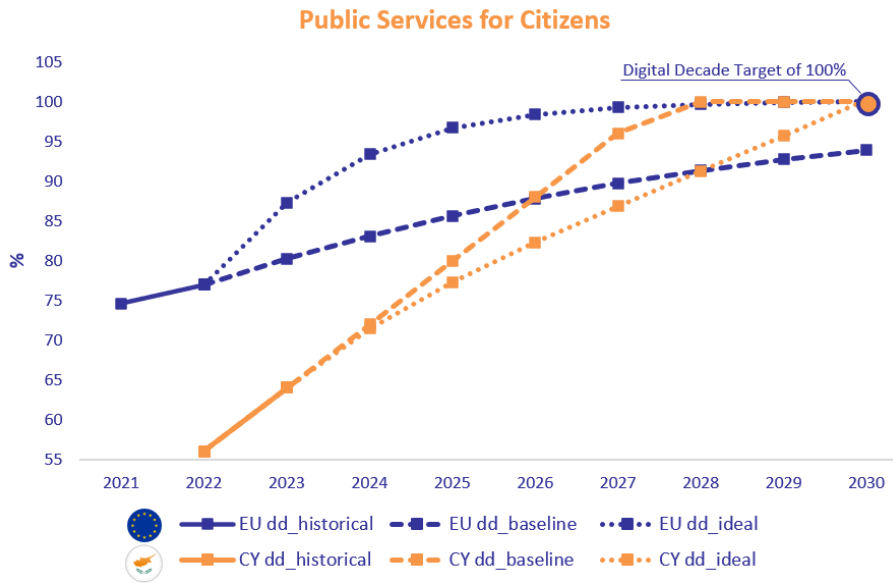
This section includes information that showcases the national trajectories and target values that EU and Cyprus have set for *KPI 13 – Public Services for Citizens, KPI 14 - Public Services for Business and KPI 15 - Access to eHealth Record.*

In the following graphs the label “dd – historical” indicates the actual progress made in EU and CY regarding the above-mentioned KPIs in recent years (wherever data was available to Cypriot Authorities). The label “dd – baseline” indicates the trajectory that the EU and CY would have followed until 2030 in the absence of the Digital Decade Programme and respective measures/actions. Lastly, the label “dd – ideal” indicates the path that EU and CY are expected to follow until 2030 in order to reach the target value, by implementing the measures and actions related to DD targets. For the case of CY the measures described also within this National Roadmap have been taken into account for the calculation of its ideal trajectory.

KPI 14 – Digitalization of Public Services for Citizens

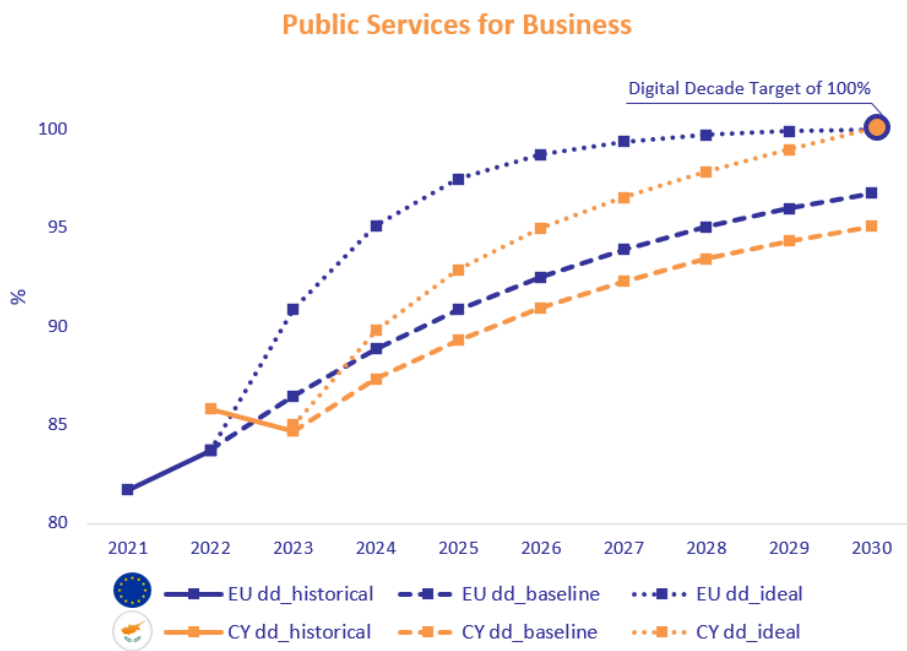
Based on available historical data, an increase on the percentage of digital public services for citizens is being observed both in EU and CY. Under current conditions, the percentage of digital public services for citizens is estimated to reach very close to 100% (98-99%) earlier than 2030, given also the momentum achieved following COVID-19 pandemic changes. However, the proposed 2030 target, as well as the ideal trajectory, are based on the condition that the measures presented in Section 4.3 will be implemented and that the challenges identified will be addressed.

Year	National DD Target (ideal)
2024	71,5%
2025	77,3%
2026	82,3%
2027	86,8%
2028	91,2%
2029	95,7%
2030	100%



KPI 15 – Public Services for Business
 Currently, the percentage of digital public services is 85% for CY and 84% for EU. Based on the available data, comparing the estimated 2030 projected value and the Digital Target set results in a difference

of approximately 4% for the case of CY. The proposed 2030 target, as well as the ideal trajectory, are based on the condition that the measures presented in Section 4.3 will be implemented and that the challenges identified will be addressed.



Year	National DD Target (ideal)
2024	89,8%
2025	92,8%
2026	94,9%
2027	96,5%
2028	97,8%
2029	98,9%
2030	100%

Figure 18 KPI 15 National and EU ideal and projected trajectory

KPI 16 – Access to eHealth Record

Currently, the percentage of Access to eHealth Record is 70% for CY and 72% for EU. The proposed 2030 target, as well as the ideal trajectory, are based on the condition that the measures presented in Section 4.3 will be implemented and that the challenges identified will be addressed.

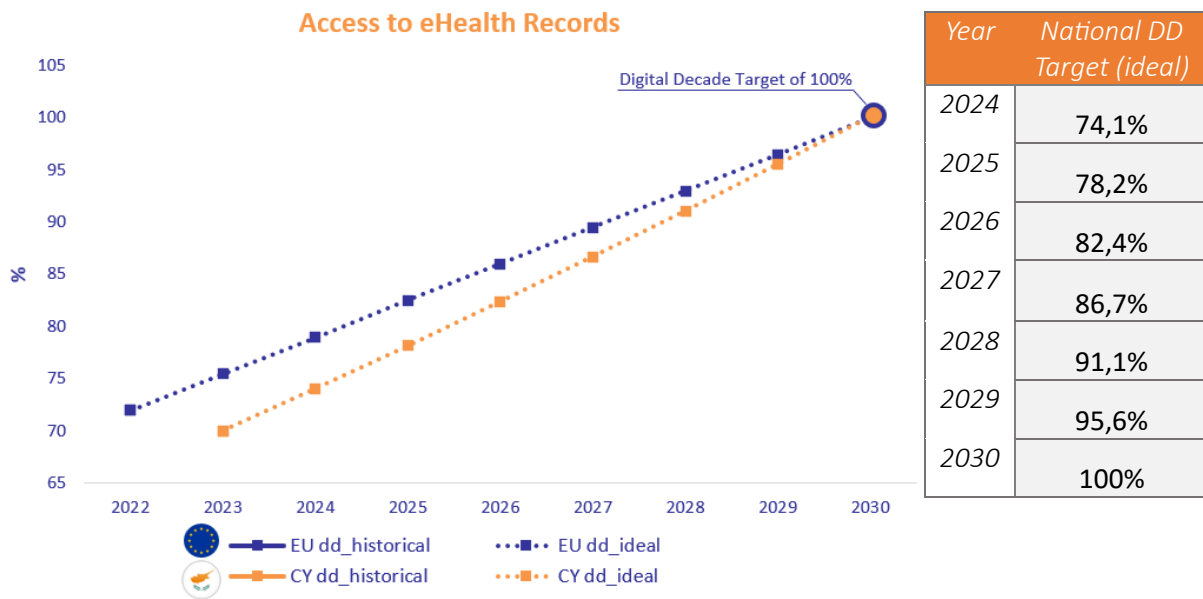


Figure 19 KPI 16 National and EU ideal trajectory

4.3 Policies, measures and actions to achieve the digital transformation of businesses and citizens

Policies

A solid, secured, integrated and modern government digital architecture will be key to achieve the transformation to a digital government and society where various IT systems interact with each other and through the government-to-government communication and interoperability framework, achieve the once-only principle (citizen to provide data to the government only once). Moreover, no duplication of data should exist in the various databases of the governmental organisations and each database should become the single source of truth for the data that it has the responsibility for, according to the Law. The database of the Civil Registry Department and the Company Registrar Department should be the single source of data for the citizen and company respectively. There is no need to collect and verify similar datasets by each governmental department.

Building a new delivery model is key for the development of end-to-end quality digital services (Digital Services Factory) where an Agile/Scrum methodology for the development of micro services will be applied, through redesigning and reengineering of procedures, and following a citizen journey that provides adaptability, response to change and is based on user experience. Open standards for the development of eServices will be used. The digital services factory will cover the needs of the Government in the development of micro-services, such as forms/applications of the government (almost total 500 public services) which are currently paper based and legacy backend systems exist.

The services will be provided securely to citizens through a single government website portal gov.cy that will be designed to meet user needs. Single-Sign-On and digital identity, are also key enablers for the secure provision of eServices. Furthermore, common mechanisms like ‘ePayments’ offering several methods of payments (visa, instant payments, direct banking etc) and ‘notification’ (SMS, email etc.) will be utilised.

Improvements in the delivery, maintenance and operating model of large-scale e-government projects are also a necessity. The project life cycle should be significantly reduced following Agile/Scrum methodologies for the implementation of e-government projects. Moreover, the policy of cloud first will be applied, where a hybrid approach, government cloud or public cloud, depending on the data classification, will be followed. The government cloud will consolidate systems and data scattered across government IT systems and implement a “cloud first” migration strategy. The government will stop owning equipment and support functions such as maintenance, backups will be provided by the private sector. It is noted that in all Ministries, the DMRID will appoint project managers to manage and monitor the implementation of strategic projects. The project managers will plan and coordinate the implementation of these projects and determine the appropriate measures to be taken to monitor the progress of the projects, manage the allocated resources and perform the necessary corrective actions where necessary.

To deliver the expected results, the DMRID and the Department of Information Technology Services (DITS) that falls under it, need to be properly organised and the necessary capacity needs to be acquired in terms of human capital, resources, and infrastructure components to successfully execute the service delivery model. To this effect, the DMRID with the support of an external consultancy agency (project funded by DG REFORM), is in the process of establishing new organisational structures and the capacity build-up to create in house the necessary skills-sets required to drive the digital transformation.

4.3.1 General overview of measures per digitalization of public services target

Based on the strengths and challenges described above, Cyprus and specifically DMRID has designed measures for building a solid, integrated and modern government digital architecture, actively addressing the related challenge regarding lengthy public procurement and project life cycles. In particular, one of the main objectives of the measures under this cardinal point of the National Roadmap is to improve delivery, maintenance and operating model of large-scale IT projects including the redesign of the lengthy procurement processes currently in place (reduction in project life cycle from 7-10 years to 2-3 years).

In addition, regarding the lack of relevant skilled resources challenge, the reorganising of institutional structures as well as roles, responsibilities and skills (upskilling and certification) has been prioritised for DMRID. During the reform and reorganisation phase, there will be a bridging the gap (skillset and human resources) through the acquisition of services from the private sector (Chief Information Security Officer, Enterprise Architect etc). In parallel, there will be on going and on the job training of DMRID staff to acquire the necessary competences in house.

The DMRID is expecting that the measures described below will actively contribute to the development of end-to-end quality digital services aiming to improve the quality of life of citizens and businesses.

Measures	2023	2024	2025	2026	2027	2028	2029	2030
KPI14								
Measure 1: Digital Service Factory (5m)								
Measure 2: eJustice (7m)								
Measure 3: Government Cloud (10.3m)								

Measures	2023	2024	2025	2026	2027	2028	2029	2030
Measure 4: New Tax System (29.2m)								
Measure 5: New System for Road Transport (11.5m)								
KPI 15								
	2023	2024	2025	2026	2027	2028	2029	2030
Measure 6: Digital Audio Recording for Judicial Service (6.4m)								
Measure 7: eLaw (3m)								
Measure 8: New System for the Department of Registrar of Companies and Intellectual Property (8m)								
Measure 9: Enhancing e-system for issuing building permits (2m)								
Measure 10: Union Customs Code Work Plan (15.5m)								
KPI 16								
	2023	2024	2025	2026	2027	2028	2029	2030
Measure 11: Electronic Health application for mobile devices (eHealth mobile app) and other access devices to the PC ecosystem. MyHealth@CY								
Measure 12: Creation of interface specifications for Health Service providers								
Measure 13: Creation of registers for holders, providers of Health Services and provider banks								
Measure 14: Creation of regulations and mechanisms for supervision of providers and banks of providers of Health Services								
Measure 15: Extended EHR@EU Data Space for Primary Use - Xt-EHR								
Measure 16: European Health Data Space for Secondary Use @CY CY-EHDS-2ND								
Measure 17: VELES Excellence Hub - Strengthening the South-East Europe Smart Health								

Measures	2023	2024	2025	2026	2027	2028	2029	2030
Regional Excellence and Boosting the Innovation Potential								
Measure 18: Expanding the European EHRxF to share and effectively use health data within the EHDS xShare								
KPI 17								
Measures	2023	2024	2025	2026	2027	2028	2029	2030
Measure 19: Notify the National eID scheme								
Measure 20: Acquiring a number of eIDs from the national eID provider in order to provide them for free to Cypriot citizens								
Measure 21: Large Scale Pilot Projects for European Digital Identity Wallet (Consortium Potential)								

Budget of all the measures that can be attributed to KPI 14,15

Measures	1	2	3	4	5	6	7	8	9	10
Target Impact (KPI)	14	14	14	14	14	14	14	15	15	15
Total Budget	5M	7M	10.3M	29.2M	11.5M	6.4M	3M	8M	2M	15.5M
National Funds	0	2.5M	5.8M	12.7M	7M	0	2.8M	0	0	3M
Allocated	-	-	-	-	-	-	-	-	-	-
Planned	-	-	-	-	-	-	-	-	-	-
Eu Funds	5M	4.5M	7.1M	16.5M	4.5M	6.4M	1.2M	8M	2M	12.5M
Allocated	-	-	-	-	-	-	-	-	-	-
Planned	-	-	-	-	-	-	-	-	-	-

Budget of all the measures that can be attributed to KPI 16, 17

Measures	11	12	13	14	15/16	17	18	19	20	21
Target Impact (KPI)	16	16	16	16	16	16	16	17	17	17
Total Budget	1.8M	-	-	-	7.4M	47.3k	62.8K	70K	8M	2.5M
National Funds	1.8M	-	-	-	-	-	-	70K	8M	1.7M

Allocated	-	-	-	-	-	-	-	-	-	-
Planned	1.8M	-	-	-	-	-	-	-	-	-
Eu Funds	-	-	-	-	7.4M	-	-	-	-	800K
Allocated	-	-	-	-	-	-	-	-	-	-
Planned	-	-	-	-	7.4M	-	-	-	-	-

4.3.2 Description of the measures

KPI 14,15

Measure 1: Digital Service Factory	
New measure	NO
Short description of the measure	<p>The project concerns the development of services to meet the needs of the Public Service within the Digital Services Factory (DSF) Project, which is a project of the Cyprus National RRP. Based on the relevant mapping of needs for eServices carried out by the Deputy Ministry of RID and the needs arising from the relevant EU Regulation for the creation of the Single Digital Gateway (Regulation EU2018/1724).</p> <p>The purpose of the Digital Services Factory (DSF) is to build a new delivery model for the development of end-to-end quality digital services aiming to improve the quality of life of citizens and businesses. The provision of digital services to the public, in a user friendly, efficient and effective way will ultimately facilitate the interaction with public services, without the need for physical presence. The DSF will develop advanced digital services following an Agile/Scrum methodology, through redesigning and reengineering of procedures, by following a citizen journey that provides adaptability, response to change and is based on user experience. Open standards for the development of eServices will also be used. Services will be provided securely to citizens through a single government website portal Gov.Cy that will be designed to meet user needs. Single-Sign-On and digital identity, are the basic key enablers for the secure provision of eServices. Furthermore, existing common mechanisms like ‘ePayment’ offering several methods of payments (visa, instant payments, direct banking etc.) and ‘notification’ (SMS, email etc.) will be utilised</p> <p>Link to the KPI 14: Digitalization of public services for citizens Tentative timeline: Dec 2026</p>
Budget and other resources allocated or planned:	National (planned): 5M euros
Expected impact and related timing:	70 new e-services are expected to be deployed by December 2026

Measure 2: EJustice	
New measure	NO

<p>Short description of the measure</p>	<p>The project concerns the development of an online Court administration information system (e-Justice System) to modernize public and local authorities, making justice more efficient and fighting corruption. It is a project of the Cyprus National RRP.</p> <p>The operations of the Courts are almost entirely based on manual and paper-based systems, with only rudimentary ICT facilities in place. In the 2020 EU Justice Scoreboard Cyprus scored poorly in the area of providing statistical information about the justice system to the public and other court users. To address the current respective problems, a project is currently underway for the implementation of a holistic e-justice system. The project currently under implementation is a fully functional, fully fledged digital solution aimed at improving the operations, processes and management of the judicial system, as well as its interactions with the public, addressing existing inefficiencies and delays.</p> <p>Besides the courts, access will be provided to other internal users which include the Law Office of the Republic, the Police and other Governmental authorities, as well as external users, which include law firms and other private sector entities including individual citizens. It is a highly complicated project but one with high added value and impact for the Cypriot society.</p> <p>Link to the KPI 14: Digitalization of public services for citizens</p> <p>Tentative timeline: Dec 2026</p>
<p>Budget and other resources allocated or planned:</p>	<p>National (planned): 7M euros</p>
<p>Expected impact and related timing:</p>	<p>The system is expected to be deployed in December 2026 and as a result of it a more efficient delivery of justice will be achieved, minimising time and administrative costs, while increasing transparency and quality of output.</p>

<p>Measure 3: Government Cloud (G-Cloud)</p>	
<p>New measure</p>	<p>NO</p>
<p>Short description of the measure</p>	<p>The project concerns the Implementation of a new cloud policy with regard to Government IT systems and services in order to promote e-government. It is a project of the Cyprus National RRP.</p> <p>The Government of Cyprus has taken the decision to follow a Cloud-First policy approach and embark on a cloud journey. In this context, the cloud policy is currently being formulated and will include criteria regarding data classification, data residency and the hosting and operation of the government IT systems either in a public cloud or a government private cloud (G-Cloud) environment.</p> <p>G-Cloud will be centrally managed (cloud broker) and will be providing co-location, infrastructure as a service (IaaS), platform as a service (PaaS) and SaaS, as appropriate, to Government institutions. It will be implemented on the premises of Tier 3 data centre providers in Cyprus. The decision regarding the initial beneficiaries that will utilise the G-Cloud will be taken after consideration of the</p>

	<p>readiness of each system. Initially, the G-Cloud will be utilised by a limited number of Departments and Ministries of the Government that will use it to host their IT systems and digital services.</p> <p>Link to the KPI 14: Digitalization of public services for citizens</p> <p>Tentative timeline: Dec 2026</p>
Budget and other resources allocated or planned:	National (planned): 10.3M euros
Expected impact and related timing:	The first engagement that will leverage the benefits of Public Cloud will be the collaboration platform for circa 16,000 government employees which is included in this measure and will be acquired as software as a service (SaaS). The system is expected to be fully deployed in December 2026.

Measure 4: New Tax System (Improving Tax collection and effectiveness of the Tax Department)

New measure	NO
Short description of the measure	<p>Implementation and Operation/ Maintenance of a new Unified Tax Management System for improving tax collection and effectiveness of the Tax Department (Safeguarding Fiscal and Financial Stability). It is a project of the Cyprus National RRP.</p> <p>“Improving Tax collection and effectiveness of the Tax Department” is a significant e-Government project that has three distinct sub projects. The “Integrated Tax Information System” which will replace the current systems of the Tax Department, as well as electronic communication applications with the public, such as Taxisnet, the use of the Ariadne electronic portal for settlement of overdue debts and the intermediate use of the Tax Portal for electronic payments and will provide its staff with modern tools. The second project titled “Online Fiscalisation” involves connecting businesses to a server held within the Tax Department and it will inform the Tax Department in real time (online) about the transactions that take place. The third project titled “Digitisation of immovable property and capital gains sector of the Tax Department”, involves the scanning and electronic storage of all documents that exist in paper taxpayer files regarding the real estate (immovable property) sector and capital gains sector (District Immovable Property and Capital Gains Tax Units) of the Department, in order to create a paperless environment.</p> <p>Link to the KPI 14: Digitalization of public services for citizens</p> <p>Tentative timeline: Dec 2026</p>
Budget and other resources allocated or planned:	National (planned): 29.2M euros
Expected impact and related timing:	The system is expected to be fully deployed in December 2026. New systems and procedures are expected to be in place and key personnel within the Integrated Tax will have been transformed completely so as to treat the taxpayer as a single entity when dealing with all his/her taxes, allowing for a better quality of the services offered to the public and providing a single service point for Citizens.

Measure 5: Development of a new integrated information system for the Road Transport Department	
New measure	NO
Short description of the measure	<p>Development of an integrated new information system for the Road Transport Department. It is a project of the Cyprus National RRP.</p> <p>Through this project the Road Transport Department (RTD) will redesign all its services to be provided electronically, thus minimising bureaucracy, improving customer service and raising productivity, while better utilising human resources. The said measure will result in lower government expenses and lower fees. The complete digitalisation of RTD's services, while taking advantage of B2G and G2G interfaces, will streamline current processes and provide flexibility for implementing new functionality and services. This project, because of its necessity to interconnect with various other departments, will be a catalyst of digital change. This project is a unique opportunity for enhancing citizen services and reducing the operating cost of public sector and social prosperity in order to achieve a step change in Cyprus' digital transformation journey. The vision of the Road Transport Department (RTD) through this project is to become a fully functioning electronic Road Transport Department (eRTD).</p> <p>Link to the KPI 14: Digitalization of public services for citizens</p> <p>Tentative timeline: Dec 2026</p>
Budget and other resources allocated or planned:	National (planned): 11.5M euros
Expected impact and related timing:	The complete digitalisation of RTD's services, while taking advantage of B2G and G2G interfaces, will streamline current processes and provide flexibility for implementing new functionality and services. This project, because of its necessity to interconnect with various other departments, will be a catalyst of digital change. This project is a unique opportunity for enhancing citizen services and reducing the operating cost of public sector and social prosperity in order to achieve a step change in Cyprus' digital transformation journey. The system is expected to be deployed in December 2026

Measure 6: Digital Audio Recording for Judicial Service	
New measure	NO
Short description of the measure	<p>Digital Audio Recording (DAR) in Cypriot Courts for the Judicial Service. It is a project of the Cyprus National Recovery Program (RRP). A Project Action Plan has been prepared specifying the functionality requirement of the system. The contractor will be selected through a tender procedure. As part of the project, the contractor will provide a comprehensive solution - services and equipment. The Project Scope includes the procurement of DAR as a Service, that includes the following: Construction (Building works to improve the sound quality of Court Rooms), networking, DAR Solution (necessary devices in courts providing audio recording and digital archiving of court proceedings), training, operational support including helpdesk.</p> <p>Link to the KPI 15: Digitalization of public services for businesses</p>

	Tentative timeline: Dec 2026
Budget and other resources allocated or planned:	National (planned): 6.4M euros
Expected impact and related timing:	The system is expected to be deployed in December 2026. The implementation of the Digital Audio Recording of court proceedings, will allow for consistent and timely production of transcripts, as well as the replaying of evidence in court, should the need arise. It will also facilitate accurate transcript management and eliminate the current dependency on individuals to produce transcripts which carries the risk of human errors. In addition, digital records of proceedings eliminate the risk of destruction associated with paperbased transcription systems. The cost of the system will be substantially lower and will allow for expandability when required to cover increased needs/ new courts. The DAR shall integrate with the e-Justice system in order to provide access to proceedings per case.

Measure 7: ELaw	
New measure	NO
Short description of the measure	<p>Digitization of Documents to enhance the capacity of the Law Office as part of modernize public and local authorities, making justice more efficient and fighting corruption. It is a project of the Cyprus National RRP.</p> <p>The ultimate goal of this project is the digital transformation of the Law Office, aiming to increase its efficiency and effectiveness, as well as the productivity, quality of work and working conditions of the employees of the Law Office. Currently there is no IT system available and all the procedures are paper based and carried out manually. Therefore, the implementation of a case and records management system and the scanning/digitalisation of its documents are essential to ensure the efficiency and effectiveness of the operations of the Law Office.</p> <p>Link to the KPI 15: Digitalization of public services for businesses</p> <p>Tentative timeline: Dec 2024</p>
Budget and other resources allocated or planned:	National (planned): 3M euros
Expected impact and related timing:	This measure will result in digitalisation (scanning) of the existing paper files, which will eventually be migrated into the core eLaw System. The system is expected to be deployed in December 2026.

Measure 8: New System of the Department of Registrar of Companies and Intellectual Property	
New measure	NO
Short description of the measure	<p>The project involves an integrated Information system for the Registrar of Companies and Official Receiver to support Businesses for competitiveness. It is a project of the Cyprus National RRP.</p> <p>The proposed project has a twofold objective: ,</p> <ol style="list-style-type: none"> 1. to facilitate the digital transformation of the DRCOR by covering and automating the desired end-to-end processes and services of the department and increasing staff productivity

	<p>2. to enhance the registrar’s enforcement capabilities to monitor compliance and keep an up-to-date register of legal and identity owner information</p> <p>Link to the KPI 15: Digitalization of public services for businesses</p> <p>Tentative timeline: Dec 2026</p>
Budget and other resources allocated or planned:	National (planned): 8M euros
Expected impact and related timing:	The measure is expected to facilitate the digital transformation of the Department of Registrar of Companies and Intellectual Property by covering and automating the desired end-to-end processes and services of the department and increasing staff productivity while on the other, they aim to enhance the registrar’s enforcement capabilities to monitor compliance and keep an up-to-date register of legal and identity owner information. The system is expected to be deployed in December 2026.

Measure 9: Enhancing e-system for issuing building permits

New measure	NO
Short description of the measure	<p>The project involves enhancing the national e-application “Hippodamos” of the Department of Town Planning and Housing for issuing building permits. It is a project of the Cyprus National Recovery Program (RRP).</p> <p>The "e-Application" environment of the "Hippodamos" System for the acceptance of applications for Planning and Building Permits needs further development and should be expanded to support all the Planning and Building Authorities. Specifically, the objectives of this measure are:</p> <ul style="list-style-type: none"> • Upgrade/expand “e-Application” environment of "Hippodamos" System for the acceptance of online applications for Planning and Building Permits. The expansion will support all the Planning Authorities and Building Authorities. • The “Hippodamos” System will be upgraded in order to enable the process of applying, studying and issuing Planning and Building Permits digitally. • Supply of additional Hardware/System software necessary for the implementation of the above. <p>Link to the KPI 15: Digitalization of public services for businesses</p> <p>Tentative timeline: Dec 2026</p>
Budget and other resources allocated or planned:	National (planned): 2M euros
Expected impact and related timing:	The digital platform to be set up that will enable applying, studying and issuing Planning and Building Permits digitally. Consequently, this will enable faster implementation of investor’s projects and will have a trickledown effect on local communities due to job creation opportunities. It will also impact planning authorities as it will remove the burden of the strategic investment applications from their workload. The system is expected to be deployed in December 2026.

Measure 10: Union Customs Code Work Plan

New measure	NO
Short description of the measure	<p>The project involves the modernisation of Customs and Electronic Payment System as part of safeguarding fiscal and financial stability. It is a project of the Cyprus National RRP.</p> <p>The development of the UCC related systems is a legal obligation of every EU Customs Administration which has to be fulfilled within a timetable provided for in the UCC Work Program. The operation of these systems will create a level playing field for European businesses and boost competitiveness. All customs formalities for the movement of goods will be completed swiftly in a paperless environment and all transactions will be recorded.</p> <p>Link to the KPI 15: Digitalization of public services for businesses</p> <p>Tentative timeline: Q4 2023 - At least 2 large import-related systems completed and operational Q4 2025 - Completion Acceptance installation and operation of at least 10 systems</p>
Budget and other resources allocated or planned:	National (planned): 15.5M euros
Expected impact and related timing:	The measure is expected to simplify and expedite customs formalities (basically moving fully to a paperless environment for customs formalities) and reduce the administrative cost for all stakeholders (Customs, other Government Services and the Trade) making revenue collection more efficient. The system is expected to be deployed in December 2026.

KPI 16

Measure 11: Electronic Health application for mobile devices (eHealth mobile app) and other access devices to the PC ecosystem (MyHealth@CY)	
New measure	YES
Short description of the measure	<p>The National Electronic Health Authority (NeHA) in full cooperation with the Deputy Ministry of Research, Innovation and Digital Policy and the Ministry of Health has decided to proceed with the development of a European Interoperable application of health services on mobile devices at a national level for Cypriot Citizens (myHealth@CY).</p> <p>The main objectives of the project are:</p> <ul style="list-style-type: none"> • Strengthening the implementation of the MyHealth@EU initiative: access to complete medical records digitally by 2030 • Giving citizens access to their health data • Providing citizens with information on health services (overnight pharmacies, hospitals, approved doctors, etc.) on their mobile phone. • Providing the Ministry of Health and the organized bodies with a tool for immediate information to the citizens or the members of the organized bodies (e.g. blood donors, heart patients, etc.) • Providing citizens with updates from organized patients groups or the Ministry of Health. <p>Link to the KPI 16: Access to eHealth records</p>

	Tentative timeline: Dec 2024
Budget and other resources allocated or planned:	National (planned): 1.8M euros
Expected impact and related timing:	As part of the Cypriot Government's efforts for digital transition of the healthcare sector and strengthening the health system's effectiveness and resilience on a harmonised cross border basis, the Mobile App is expected to have a significant impact on the electronic accessibility of eHealth records. The App is to be deployed in December 2024.

Measure 12: Creation of interface specifications for Health Service providers

New measure	YES
Short description of the measure	The National e-Health Authority (NeHa) will proceed with the issuance of specifications and written instructions to the users and operators of the health databases on issues of privacy policy, security, interoperability and control (NeHA and DRMID) Link to the KPI 15: Access to eHealth records Tentative timeline: November 2024
Budget and other resources allocated or planned:	Human resources mobilized
Expected impact and related timing:	Issuance of specifications and written instructions to the users and operators of the health databases on issues of privacy policy, security, interoperability and control.

Measure 13: Creation of registers for holders, providers of Health Services and provider banks

New measure	YES
Short description of the measure	The NeHa will proceed with the implementation of registers of providers and citizens for the purpose of secure authorization and authentication EAUH in collaboration with Population Archive, Medical services, Cyprus Medical Association and HIO Link to the KPI 16: Access to eHealth records Tentative timeline: Oct 2024
Budget and other resources allocated or planned:	Human resources mobilized
Expected impact and related timing:	This measure is expected to have a significant impact on the electronic accessibility of eHealth records.

Measure 14; Creation of regulations and mechanisms for supervision of providers and banks of providers of Health Services

New measure	YES
Short description of the measure	NeHA's process provides for the establishment of routine and emergency audit mechanisms of providers and provider database owners. Collaboration: CMA and Medical scientific societies, HIO, biobanks Link to the KPI 16: Access to eHealth records

	Tentative timeline: Nov 2024
Budget and other resources allocated or planned:	Human resources mobilized
Expected impact and related timing:	The NHS will establish safety teams and procedures for this purpose

Measure 15: Extended EHR@EU Data Space for Primary Use - Xt-EHR	
New measure	NO
Short description of the measure	<p>The Xt-EHR joint action supports the EC’s policy priority for “A Europe fit for the digital age” by implementing the EU4Health Programme’s general objective of “strengthening health systems”. This project will enhance the cooperation among MS regarding the interoperability and exchange of healthcare data, contribute to the preparation of the foundations for the improved primary use of electronic health data, the upcoming new regulation for the European Health Data Space (EHDS), and empower individuals to control their health data.</p> <p>More specifically, the Xt-EHR proposal will prepare implementation guides, technical specifications, and a conformity assessment framework for the adoption of the European Electronic Health Record Exchange Format (EEHRxF), at a European Level. The activities under this joint action will effectively perform common actions across MS as above-mentioned for:</p> <ul style="list-style-type: none"> • The adoption of the EEHRxF common requirements and specifications on interoperability and health information exchange for patient summary, electronic prescriptions, and electronic dispensations, as well as for medical images, laboratory results and discharge letters into EHR solution in the European digital single market. • Evaluate telemedicine, mobile health, and other health software in the context of the EEHRxF and the EHDS Regulation proposal. • Evaluate common EHR requirements for electronic identification for health professionals and patients (based on the European Digital Identity framework), and the necessary metadata layer needed. • Evaluate the sustainability of cross-border telemedicine services, including telemonitoring. • Prepare a guideline and interoperability requirements for mobile wellness applications and provide a respective conformity assessment and or labelling scheme. • Provide a conformity assessment scheme for the certification of EHRs in Europe under the EHDS regulation. <p>Through Xt-EHR, the interoperability and cross-border exchange of different types of health data will be promoted by proposing the necessary implementation guidelines for the implementation of new services that will complement the MyHealth@EU initiative. The necessary integration profiles of EHRs in the European market will be defined for improving the coordination of MS joint efforts towards interoperability in the EHDS proposal for primary use of health data.</p>
Budget and other resources allocated or planned:	Total Budget: €5,896,848 (NEHA Total budget: €974,884.49)

Expected Impact of the measure and related timing:	This measure is expected to enhance the cooperation among EU MS regarding the interoperability and exchange of healthcare data. It will also contribute to the preparation of the foundations for the improved primary use of electronic health data.
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Measure 16: European Health Data Space for Secondary Use @CY CY-EHDS-2ND

New Measure	NO
Short description of the measure	<p>The European Health Data Space (EHDS) is a health specific ecosystem comprised of rules, common standards and practices, infrastructures and a governance framework. The EHDS will provide a better European Health Union for its citizens and thus needs the active participation of all the Member States in an interoperable and health data exchange environment not only for primary but also for secondary use.</p> <p>EHDS objectives:</p> <ul style="list-style-type: none"> • Empowering individuals through increased digital access to and control of their electronic personal health data, at national level and EU-wide. • Fostering a single market for electronic health record systems, relevant medical devices and high risk AI systems. • Providing a trustworthy and efficient set-up for the use of health data for research, innovation, policy-making and regulatory activities (secondary use of data). <p>The European Health Data Space is a key pillar of the European Health Union. It builds further on the General Data Protection Regulation (GDPR), and the NIS 2 Directive.</p> <p>Cyprus aspires to become an active member of the EHDS. The main objective is to support Cyprus’ efforts to implement the national health data access body (HDAB) as envisaged in the proposed EHDS Regulation, thus becoming part of the European secure peer-to-peer infrastructure to foster secondary use of health data.</p> <p><u>The National eHealth Authority (NeHA), is the Competent Authority to be the HDAB, because it is the national health data controller</u> and in charge of the cross-border health services, and according to the eHealth Law (N.59 (I)/2019) the NCP for eHealth. With this direct funding NeHA will be expanding its digital business capabilities, establishing its connection with HealthData@EU and related services for the development of the EHDS for secondary use of health data. In this respect Cyprus through NeHA and the partners in this proposal will address how its legal framework and the technical set up will be able to address the secondary use of health data - HealthData@EU – by addressing Legal and Governance issues, Health Data and Quality, Infrastructure Needs, and Capacity Building, aiming at offering better policy making nationally and at EU levels, while enhancing services for research and innovation activities. The goal at National and EU levels should be the better healthcare services by means of prevention and early diagnosis when it comes to primary care for better serving the citizen.</p>
Budget and other resources allocated or planned:	Total Budget: €1,497,465 (NEHA Total budget: €687,475.00)
Expected Impact of the measure and related timing:	This measure is expected to draw on the creation of a new and decentralised EU infrastructure for secondary use of health data (HealthData@EU) that will connect

	health data access bodies which should be set up in all Member States. This infrastructure will be piloted in a EU4Health project starting in 2022.
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Measures 17: VELES Excellence Hub - Strengthening the South-East Europe Smart Health Regional Excellence and Boosting the Innovation Potential¹⁷

New measure	NO
Short description of the measure	<p>Smart Health is EU Strategic Value Chain that contributes to growth, jobs and competitiveness. Health Data is the main enabler for the value chain, but it also depends on cutting edge technologies - AI, cloud computing, IoT, to integrate the dispersed knowledge and support innovative healthcare solutions and services. EC sets the creation of a European Health Data Space as a main priority, to promote better exchange and access to health data.</p> <p>On a regional level, the RIS3 strategies of the involved countries - Bulgaria, Romania, Greece and Cyprus emphasize the need for based on Big Data, AI and IoT digitalized healthcare, to enable personalized medicine, informed decisions, and improved disease prediction. Research and Innovation Smart Specialisation Strategies (RIS3) also outline the need for more funding for R&I, policy coherence and development of territorially join innovation strategies. A cross country coordinated approach is needed to align the separate endeavours towards an Excellent South-East Europe Smart Health Innovation Ecosystem enabled by a Regional Smart Health Data Space. VELES raises the level of innovation excellence in the South-East EU through creating a sustainable place-based innovation ecosystem, enabled by Regional Smart Health Data Space, including novel transformational framework, R&I and investment strategy and action plan for research, development and adoption of innovative and secure digital solutions that underpin the delivery of sustainable healthcare services. The Regional Smart Health Data Space will be demonstrated through the design of 4 interrelated pilots on:</p> <ul style="list-style-type: none"> • Cancer treatment (Greece); • Personalised/precision medicine of Alzheimer (Bulgaria); • Cerebral tumours (Romania) and • Dementia (Cyprus). <p>The aim of VELES is to foster health data sharing regional and national strategies, to secure improved clinical practice, to preserve patient’s privacy and to empower citizens’ smart healthcare through access to innovative, cyber secure and data driven digital health services.</p>
Budget and other resources allocated or planned:	Total Budget= €4,750,000 (NEHA Total budget: €189,375.00)
Expected Impact of the measure and related timing:	This measure is expected to produce research results and share knowledge on how Big Data, AI and IoT can support innovative healthcare solutions and services. Therefore, it is expected to have an indirect impact on e-health services solutions able to offered to citizens in the future.

Measure 18: Expanding the European EHRxF to share and effectively use health data within the EHDSxShare

New measure	NO
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¹⁷ CORDIS, <https://cordis.europa.eu/project/id/101087483>

Short description of the measure	<p>xShare envisions everyone sharing their health data in EHRxF with a click-of-a-button. The xShare button to be featured across health portals and patient apps and allow people to exercise their data portability rights under GDPR. Hence, the European EHRxF will be the driver for research and innovation in EHDS. xShare will establish the European EHRxF Standards and Policy Hub, the “Hub” partnership of six standards developing organizations (CEN/TC251, HL7 Europe, IHE Europe, SNOMED, CDISC, IEEE) market actors (DIGITAL Europe, MedTech-Europe and EUCROF), supported by competence centers, nationals and regional authorities and European SMEs.</p> <p>xShare will develop:</p> <ul style="list-style-type: none"> • Harmonized common specifications, create and maintain xBundles i.e., collection of common data specifications including FHIR implementation guides, tools and data sets, and educational support for key EHRxF health information domains as noted in the EHDS draft regulation Annex 1. 2) A set of common elements across EHRxF health information domains applicable across EHDS-1 (JA-9), public/population health (EHDS-2), and clinical research. • Extended harmonized IPS specification to include care plans and making it fit for the purpose of clinical research use cases i.e. clinical trial eligibility, real world data, patient reported outcomes, and returning clinical research data to patients. • xShare feature the xShare Button in 8 adoption settings in Hospital network (Italy), National portal (Greece, Ireland, Cyprus), regional network with emphasis in medical tourism and the connection of the public to the private sector (Catalunya and Madeira), entry of digital health applications to the myHealthSpace ecosystem in France. Care plans will be demonstrated in Denmark. <p>xShare investigate the feasibility and value of the EU xShare Industry label as a vehicle towards implementing the draft EHDS regulation. Lastly open calls at the last year of the project aim to onboard with EHRxF almost 100 settings across Europe.</p>
Budget and other resources allocated or planned:	Total budget: €7,999,882.50 (NEHA Total budget: €188.437,50)
Expected Impact of the measure and related timing:	This measure is expected to facilitate the cross-border exchange of data in certain health information domains, which should constitute the baseline for a European electronic health record exchange format.

KPI 17

Measure 19: Notification of Cypriot eID scheme	
New measure	YES
Short description of the measure	<p>The Republic of Cyprus has decided to proceed with the notification to the European Commission and to the other Member States of the Cypriot electronic identification scheme pursuant to article 9 of the Regulation (EU) 910/2014 (eIDAS Regulation), aiming for the high assurance level.</p> <p>DEC has been designated as the Competent Authority for the implementation of the said Regulation. According to the national law and the relevant Regulations (2021), the DEC is the responsible body for licensing Trust Service Providers (TSPs) to provide electronic identities (eID) to Cypriot citizens aged over 18. The TSPs are required to follow a remote server solution using public key infrastructure (PKI). Until today, only one TSP has already been authorised by the DEC in February 2022 and started issuing eIDs in January 2023.</p>

	<p>The government is working on identifying use cases for eID and has already launched the first stage in the process of purchasing and distributing a number of EIDs for public servants.</p> <p>The main objectives of the project are:</p> <ul style="list-style-type: none"> • the Cypriot electronic identity to be mutually recognized by the other Member States (that is, to be able to use the Cypriot electronic identity in the other Member States). • The public will be able to use EID to access digital public services through the CY login mechanism (official website of the Government). • In addition, the public will be able to use EID to sign documents with qualified electronic signatures through a signing platform. <p>Before the official notification of the system to the EU, the Cypriot scheme should be pre-notified (pre-notification) to the EU and to the other MS so that the scheme can be evaluated by the other MS (peer evaluation) which is done by “Cooperation Network (eIDAS Cooperation Network).” The MS evaluates, among other things, the level of assurance of the scheme.</p> <p>The Member States draw up and submit a report with the results of the evaluation to the Cooperation Network. The desired outcome of this assessment is for the Cyprus electronic identification scheme to contribute to building trust between Member States and to ensure the interoperability and the security of the notified electronic identification scheme (e.g., to be assessed with a high level of assurance).</p> <p>In July 2023, the pre-notification request was submitted to the EIDAS Cooperation Network to start the peer review process. The kickoff meeting of the peer review evaluation started on the 29th of August 2023, and it is estimated to end in November 2023.</p> <p>Link to the target: notification of the eID electronic identification scheme to the European Commission and the other Member States, aiming for a high level of assurance.</p> <p>Tentative timeline: The project started in March 2023, and it is estimated to be completed in January 2024. (i.e., the system to be officially notified to the EU by January).</p>
Budget and other resources allocated or planned:	National (planned): 0,07M euros
Expected impact and related timing:	The expected impact is one Cypriot notified electronic identification scheme to the European Commission and the other Member States.

Measure 20: Acquiring eIDs from the national eID provider	
New measure	YES
Short description of the measure	The Republic of Cyprus has decided to proceed with acquiring a number of eIDs from the national eID provider in order to offer them with no fee to the Cypriot

	<p>citizens. The plan is to proceed with a negotiation process to purchase at least 250k eIDs. eIDs will be distributed to public servants and to also to Cypriot citizens</p> <p>The government is also working on identifying use cases for eID.</p>
Budget and other resources allocated or planned:	National (planned): 8M euros
Expected impact and related timing:	Promote the use of eIDs in the country

Measure 21: Large Scale Pilot Projects for European Digital Identity Wallet (Consortium Potential)

New measure	YES
Short description of the measure	<p>Assembling 143 participants from 19 EU Member States (MS) plus Ukraine, POTENTIAL pilots the EU Digital Identity Wallet Pilot implementation (EUDIW) reference by implementing six use cases (UC): “eGov Services”, “Account opening”, “SIM registration”, “mDL”, “rQES” and “ePrescription”. POTENTIAL’s technical implementation features are implemented in two Work Packages (WP): WP2 aims at collectively defining and implementing an interoperable cross-border wallet infra-structure, as technical prerequisite for the UC. WP3 pilots the functionalities of the wallets in cross-border usage scenarios providing complementary UC as basis for further development of a EUDI ecosystem in different areas. Interoperability and scalability of the developed solutions are tested in each UC, laying the foundation for a unified and synchronized approach benefiting the usage of overall resources, the alignment architecture and scope of technical implementation, with focus on enhanced security and common standards for personal data exchange.</p> <p>POTENTIAL fosters competitiveness in Europe by enabling accelerated business processes and creating new business opportunities in multiple sectors. The different UC target a wide spectrum of public and private stakeholders to ensure a broad service provision contributing to the enablement and empowerment of citizens, including persons with difficulties to access services. To ensure high usability, POTENTIAL’s communication and dissemination strategy promote opportunities for the new infrastructure and enable MS to build the necessary expertise and infrastructure. POTENTIAL also intends to engage with other EU funded projects and with other successful consortia in the same Call to enhance synergies. Cooperation possibilities to observe, participate or integrate with POTENTIAL shall be offered to non-participatory MS which may choose from varying integration intensity levels.</p> <p>Link to the target:</p> <p>The pilots contribute to the overall EU Digital Strategy which highlights the necessity of a universally accepted eID for citizens. In her State of the Union address in September 2020, Ursula von der Leyen announced that Europe should secure digital sovereignty in 2030, based on clear goals and principles with special emphasis on a secure DI for all European citizens.</p>

	<p>POTENTIAL shall test the sample wallet and its updated releases starting in April 2023. It supports the EUDI Framework and the implementation of the OOTS under the SDGR.</p> <p>POTENTIAL applies for funding under DIGITAL to accelerate best use of technologies, contributing to the successful implementation of DSMS.</p> <p>Tentative timeline: The Project’s starting date is 1 April 2023 (fixed date). It’s end date will be 31 May 2025 (Project duration: 26 months).</p>
Budget and other resources allocated or planned:	<p>National: 1.767.640 euros (For DMRID only)</p> <p>EU: 809.774.64 euros (For DMRID only)</p> <p>Human resources mobilized</p>
Expected impact and related timing:	<p>In 20 participating countries POTENTIAL expects to engage more than 7.000 wallet users with more than 70.000 wallet transactions (more than 30.000 in the pre-production environment) in a production environment by the end of the Large Scale Pilot (LSP). One quarter is expected to be cross-border transactions. The LSP key performance indicators for all UC refer to the pre-production environment.</p>

V. Main policies, measures and actions to contribute to the general objectives

Taking into account the Declaration of Digital Rights and principles, Cyprus has elaborated a significant number of nations policies and actions which are expected to contribute also to the general objectives of the Digital Decade Policy Programme 2030 (Article 3). These policies and actions are briefly presented in the following table.

	General Objectives	Policies and Actions that will possibly contributions
human-centred, non-discriminatory, transparent and open digital environment	Referring to the objectives mentioned under Article 3(1) (a) & (i)	The DMRID has developed and is responsible for the implementation and monitoring of the National Digital Strategy of Cyprus 2020-2025 ¹⁸ . The strategy sets an aspirational vision for Cyprus to become fit-for the future society and knowledge-based economy. Two out of the four strategic objectives of the Strategy refer to developing technology that works for people and creating an open democratic and inclusive society.

¹⁸ DMRID, https://www.dmid.gov.cy/dmid/research.nsf/planning01_el/planning01_el?OpenDocument

		<p>In addition, among the guiding principles of the National Digital Strategy is:</p> <ul style="list-style-type: none"> • being user-centered, placing user needs at the heart of every action to develop and implement digital infrastructure and services; • being inclusive and universal, creating a non-discriminatory digital society for all citizens.
bridging the digital divide	Referring to the objectives mentioned under Article 3(1) (b) & (d)	<p>One of the ways to help reduce the digital divide and accelerate digitalization is to spur competition between providers which in turn will lead to lower prices, making ultrafast internet more affordable for the subscribers. Therefore, the Government has to intervene to expand the ultrafast broadband coverage in areas where there are no private investments and at the same time to increase the demand (take-up) in ultrafast broadband services by applying demand side measures. The National Broadband Plan 2021-2025 and the 5G Action Plan can be a catalyst in this direction.</p> <p>The Cyprus Broadband Plan sets the following strategic objectives for 2025:</p> <ul style="list-style-type: none"> • Objective A: Promote private investments as much as possible, remove administrative barriers and encourage stakeholders' co-operation. • Objective B: Ensure comprehensive availability and the widest adoption of ultrafast broadband services. <p>In this regard, it sets the following connectivity targets, to be achieved by 2025:</p> <ol style="list-style-type: none"> 1. Synchronous Gigabit connectivity for all main socio-economic drivers (schools, hospitals etc.). 2. All premises in organized communities (urban or rural) to have access to internet connectivity offering a download speed of at least 100Mbps, which can be readily upgradable to 1 Gbps. 3. 100% of the population living in organized communities (urban or rural), and all major terrestrial transport paths to have uninterrupted 5G coverage with a download speed of at least 100 Mbps. 4. 70% of households to have an internet connection (take-up) with a download speed of at least 100Mbps.
supporting the competitiveness and sustainability of the EU's industry and economy	Referring to the objectives mentioned under Article 3(1) (c)	<p>Cyprus has developed its national Broadband Plan 2021-2025. The Plan is aligned with the EU's policy objectives as regards the transition of Europe towards a Gigabit Society and complements market efforts and includes detailed and targeted actions making effective use of available financial instruments at European level including the RRF.</p> <p>The actions aim on the one hand at creating a private investment-friendly environment by removing of administrative barriers and on the other hand at the wide availability and adoption of high-speed broadband services for the benefit of the citizens and businesses of Cyprus.</p>

Contributing to the green transition	Referring to the objectives mentioned under Article 3(1) (h)	RRP of Cyprus has included a specific Policy Pillar aiming to contribute to the green transition and environmental sustainability, through the achievement of national targets for climate neutrality, energy efficiency and renewable energy sources. Complementarily with the measures described in sections 1.3, 2.3 and 3.3 and 4.3 of this Roadmap the measures under green transition Pillar of Cyprus' RRP are expected to help the country become more sustainable, resilient and better prepared for the challenges and opportunities of the green and digital transition.
R&I and sustainability of the digital future	Referring to the objectives mentioned under Article 3 (1) (c) & (d) and Principle 6 of EU Declaration of Digital Rights and principles	The DMRID has developed the "Cyprus research and innovation strategy framework 2019/2023" which has recognised the principle of sustainability as a major goal to be achieved for the country. Specifically, the strategic framework proposes nine strategic pillars that will act as key enablers of the national strategy for achieving sustainable economic development and social prosperity.
Accessible health and care Services in a trusted and secure online environment for everyone	Referring to the objectives mentioned under Article 3(1) (g)	The Strategy of the Ministry of Health 2021-2023 includes among its basic activities for the promotion of e-health and the development of a coordinated approach on e-health actions. The reforming of the healthcare system imposes the development of flexible e-health tools that will enable the easiest access of patients to healthcare and the more effective and efficient management of public health and the healthcare system overall.

VI. EU level cooperation

Although the EU and its Member states individually are already supporting the Digital Decade programme through several measures, initiative and policies, a smooth achievement of the EU's digital transformation is far from guaranteed. Instead, this digital transformation will require additional policy measures, actions and investments. To this end, the Digital Decade Policy Programme establishes a framework for multi-country projects (MCPs), highlighting the importance of joining forces between Member States. The European Commission will work towards accelerating and facilitating the launch of multi-country projects, large-scale projects that no single Member State could develop on its own.

These MCPs could combine investments from the EU budget, including funds from the Recovery and Resilience Facility, from Member States national budgets, and private sector investments. Their objectives could be to address gaps in the identified critical capacities of the EU and/or support an interconnected, interoperable and secure Digital Single Market. Cyprus already participates in many MCPs, which are presented in the following sections.

1. List of MCPs with Cyprus' participation

MCPs regarding Digital Skills

EDIC "EU Cyber Security Skills Academy"

Scope:

This EDIC would develop a Cybersecurity Skills Academy, an umbrella organisation under which different MS entities would integrate various activities/actions related to cybersecurity education and training for start-ups, SMEs, and the European public sector, as well as standardisation of procedures for cybersecurity competence recognition and professional certification.

Specific Objectives:

- Providing information & transparency for all EU stakeholders
- Becoming a reference point for curricular design on Cyber Security education and life-long learning
- Development of dedicated training programmes – knowledge & material generation (open source) for education & training for increasing the pool of experts in the workforce
- Increasing the effectiveness of training efforts
- Coordinating Multi-Country training and exercises
- Defining KPIs for Quality Assessment and Quality assurance as regards cyber security training programmes
- Developing and implementing an EU Certification System in accordance with other EU agencies such as ENISA
- Providing an overview about the available European funding/subsidies/programmes for cyber security skills development
- Acting as an information exchange platform for EU funded cyber security research projects
- Development of focus branch centres in other MS, linked to HQ in Athens, e.g. Focus branch centre on Skills development against Fake news or Simulation games/Cyber-range in Vienna
- Bridging function to pre-accession countries
- Organisation of dedicated EU conferences to foster the dialogue between administration, science & research, trainers and industry to foster effective information exchange across the cybersecurity ecosystem.

Expected outcome:

A cybersecurity skills academy can help the digitalization of businesses in several ways including upskilling and reskilling of workforce, promoting innovation in the cybersecurity sector, building a strong cybersecurity ecosystem by connecting businesses, government agencies, and educational institutions. It can also help businesses with their digitalization efforts, namely:

- Help businesses to assess and manage their cybersecurity risks
- Assist businesses in implementing cybersecurity best practices
- Help businesses to stay up-to-date on the latest cybersecurity threats
- Provide a pipeline of qualified cybersecurity professionals.

Overall, a cybersecurity skills academy can play a vital role in helping businesses to secure their digital assets and infrastructure.

EDIC members for the EDIC “Cyber Security Skill academy”

- Actual candidates: Greece, Cyprus, Austria
- EDIC planned location: Greece
- Other MS examine their participation to EDIC “Cyber Security Skill academy”

Tentative timeline:

2024/2025 to 2030 and beyond (establishment of EDICs).

Budget

Budget to be defined following the establishment of EDICs, the final decision for Cyprus' participation and the definition of annual participation fees for the participating MS.

MCPs regarding advanced digital infrastructures

Q-EUROPE EDIC

Scope:

The area of quantum research development is one of the most dynamic and of significant attention scientific areas, which is developed by all technologically advanced economies and countries in the world. In addition, this area is of strategic importance for advanced applications, services and security. In Europe, each of the EU Member States conducts its research in this field and participates in a number of programs for the technological development and the construction of quantum infrastructures in the EU.

Specific Objectives:

- Effective use of research results and maintaining this scientific development dynamics along with the rapid commercialization processes
- Guarantying the maintenance of the built infrastructures
- Achieving synergies in the development of projects implemented in the area of quantum technology development (e.g construction of 6 quantum computers as part of the EuroHPC JU initiative, construction of national quantum communication infrastructures in 26 EU countries (Euro QCI), research in 11 quantum areas in Horizon Europe (signed Framework Partnership Agreement - FPA) or preparation for the construction of a quantum metrology infrastructure (e.g., CLONETS project under H2020)
- Integrating national research activities and developing infrastructures in order to achieve improved cooperation between the EU and its MS
- Strengthening technological excellence and innovation of European services and products
- Building new and improving existing supply chains, ranging from components to advanced technological solutions
- Address the issue of the sustainability of products, services or infrastructure and their availability, as well as to organize the administrative structure for their maintenance.
- Boosting close cooperation within European related industry, especially with SMEs, and using the structure of existing and newly established DIHs.
- Providing education and training on new digital skills in the field of quantum technologies both in the development and use of new quantum products and services.

The following KPIs are goals of the Q-EUROPE EDIC:

- Maintenance and operation of QCS, QCI, QCM infrastructures and the national infrastructure projects in the quantum area until 2034.
- Support for at least 100 products and services produced in the European Economic Area.
- Training and courses for at least 1,000 people in each country involved.

Members of Q-EUROPE EDIC consortium:

- Greece represented by GRNET with national government support
- Ireland represented by Heanet
- Poland represented by Poznan Supercomputing and Networking Center with national government support
- Cyprus represented by CYQCI

Tentative timeline:

Q-EUROPE EDIC is scheduled to start operations on January 1, 2024, and the expected period of operation is 10 years (until the end of 2034) with a possibility of extension.

Budget:

Due to the fact that both national and European quantum structures are under construction, it is difficult to estimate the final operating costs of Q-EUROPE EDIC and therefore it is estimated that in 2024 the operating costs per country are 300.000 Euro and from 2025 to 2034 these costs will climb to be at least 1MEuro per year per country. These costs would be shared under the 50/50 model between funding from the European Commission and national funding.

In the meantime, products, services and access to national quantum infrastructures built as part of national investments can be an in-kind contribution to Q-EUROPE EDIC.

MPCs regarding Digitalization of Businesses

EDIC for European Blockchain Partnership and European Blockchain Service Infrastructure (EBSIC-EDIC)

Scope:

The European Digital Infrastructure Consortium (EBSIC-EDIC) will contribute to reinforcing and broadening a joint initiative initiated with the European Blockchain Partnership (EBP). The consortium, working in cooperation with the EC, was established in 2018 and it currently gathers all EU Member States, Liechtenstein and Norway, as well as Ukraine (as an observer).

After development and piloting phase, the EBSI is now ready for operational exploitation and will continue the work of the EBP in liaison with the EC and other EU institutions/bodies. EBSIC-EDIC will create a new entity providing for reliable and long-term governance and will benefit from a legal personality recognized by all EU Member States as an International Organisation. It will give more power to drive the growth and development of the EBSI, fostering trust and confidence in its services. It will contribute to an EU strategy on decentralised technologies, including Blockchain / DLT or web3.0 and their further evolution towards the digital worlds. The EBSIC-EDIC will be set-up with the purpose to establish, operate and enhance an infrastructure for delivering EU-wide cross-border public services, serving citizens and businesses and facilitating the implementation of EU Policies. It will help address the objectives of the Digital Decade Policy Programme 2030, leveraging blockchain and decentralised technologies for reinforcing trust and security in the digital transformation of public and private services.

Specific Objectives:

- Inspiring the EU strategy and supporting the digital transformation of public and private service, addressing the evolution of the web services and the game changing role of decentralised technologies.
- Reinforcing the trust and cyber resilience of services, by leveraging decentralised technologies.
- Strengthening the European ecosystem and the European autonomy in an open manner regarding decentralised technologies.
- Accelerating the uptake of digital infrastructure solutions by government and industry, supporting the development of open standards and common practices.
- Strengthening digital skills and competencies.

Members of EBSIC-EDIC: Belgium, Italy, Slovenia, Poland, Croatia, and Portugal are the first countries currently engaged in EBSIC and many more are expected to follow.

Budget: The current annual contribution for founding MS is set at €100,000 + €125,000 in kind contribution (2023, 2024).

- Possible new Multi-Country projects (not yet included in the list of areas of activity for MCP in the Annex of the Decision), for which the Member State identifies a need

Area of the MCP	<ul style="list-style-type: none"> • EU4H-2023-JA-10: Direct grants to Member States' authorities: preparatory activities for the reuse of data in the proposed European Health Data Space (DI-g-23-79) - 4M euros EU co-funding • EU4H-2023-DGA-MS-IBA-04: Direct grants to Member States' authorities: increase health data semantic interoperability and build national capacity on health terminologies (DI-g-23-75) - EUR 5,4M euros EU co-funding • EU4H-2023-DGA-MS-IBA-05: Direct grants to Member States' authorities: development and enhancement of MyHealth@EU services, including vaccination card services (DI-g-23-77) - EUR 4M euros EU co-funding
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2. Facilitating factors at EU level

The EU and Member States can play a leading role in facilitating the digital transformation of businesses in the EU. Some key facilitation factors for cooperation at EU level are the following:

- Promoting a better use of EU programs and initiatives that support the digital transformation of businesses (Connecting Europe Facility, Digital Europe Programme, Horizon Europe)
- Promoting initiatives like EU Startup Fund or EU SME Instrument that provide funding to early-stage startups that are developing innovative digital solutions and to SMEs to help them develop and commercialize innovative products and services
- Enhancing cooperation capabilities regarding cybersecurity to protect businesses from digital threats
- Sharing of best practices between MS to support digital transformation. This could be done through organizing workshops, conferences, and other events.
- Promoting Joint initiatives that allow MS to collaborate e.g. EDICs to support digital transformation.

By working together, the EU and Member States can create a supportive environment for businesses to adopt digital technologies and transform their operations. This will help businesses to grow and compete in the global economy.

VII. Stakeholder feedback

Considering the country size of Cyprus and aiming to progress its digital transformation, the DMRID aims to actively involve and engage a variety of stakeholders in the design of its policies and strategies. As such, the DMRID has performed an initial stakeholder mapping which identified the stakeholders playing a vital role in shaping, guiding, implementing, and benefitting from the policies, measures, and actions associated with digital transformation.

This stakeholder list will be updated on a regular basis (and included also in the updated versions of the National Roadmap). The stakeholders shortlisted during this initial stage are presented below. This group of stakeholders is expected to have a key role during the implementation of the National Roadmap and will be directly benefitted from the measures, and actions associated with digital transformation:

- **Government Departments and Ministries:** Especially those related to education, digital transformation, innovation, finance and commerce, play a crucial role in policy formulation and

implementation (e.g., Ministry of Education, Ministry of Energy, Commerce, and Industry (MECI), Ministry of Finance).

- **Regulatory Bodies:** Authorities responsible for telecommunications, data protection, cybersecurity, and other relevant sectors are crucial in setting guidelines and standards (e.g. Office of Electronic Communications & Postal Regulation, Digital Security Authority).
- **Business Associations & Chambers of Commerce:** Organizations representing businesses, both large and small, can provide feedback on the needs and challenges faced by businesses in adopting digital technologies (e.g. Cyprus Chamber of Commerce and Industry (CCCI) and Cyprus Information Technology Enterprises Association (CITEA)).
- **Research Institutions & Universities:** Those stakeholder types can provide data, research, and expertise to guide the development of effective policies (Cypriot Centres of Excellence, Local Universities).
- **Technology & Digital Service Providers:** Companies and organizations offering digital solutions, platforms, and services are key partners in enabling the actual transformation.
- **SMEs and Startups:** The businesses themselves are critical stakeholders as the primary beneficiaries and participants in digital transformation efforts.
- **General Public and Consumers:** As the end-users of multiple digital services, their needs, concerns, and feedback is invaluable for shaping effective policies.

Prior to the elaboration of this National Roadmap, various departments of DMRID which are the Implementing Authorities of RRF measures have started conducting official public consultations in order to gather feedback from interested stakeholders (e.g. DEC has conducted public consultations for the Investment 2: Enhance building cabling to be “Gigabit-ready” and promote connectivity take-up and Investment 1: Expansion of Very High Capacity Networks in underserved areas). These detailed and targeted public consultations have provided valuable information for the implementation phase of the measures.

Following the finalisation of the first version of the National Roadmap, the DMRID is planning to launch an overall public consultation process for the complete National Roadmap. The results of this public consultation will be incorporated in the updated version of the document.

VIII. Overall impact and conclusions

The Cyprus Digital Decade Strategic Roadmap charts an ambitious course toward a digitally and technologically empowered future, propelled both by national policies, measures and actions and by the broader EU Framework established by the Digital Decade Policy Programme. As reflected in this National Roadmap, Cyprus has achieved significant progress over the last years, however there is still area for improvement regarding for example the challenges related to broadband coverage, digital infrastructure and the digitalization of businesses. According to Digital Decade Country Report 2023, *Cyprus should accelerate its efforts in the areas of digital skills, connectivity infrastructure (notably on fixed very high-capacity networks), digitalization of businesses and digital public services.*

In this context, Cyprus’ RRP devotes 282.2M euros (23% of total RRP funds) to the digital transition of the country. From these funds, 261.9M euros are expected to contribute explicitly to the Digital Decade targets. As depicted in this Roadmap, the DMRID utilizes funding not only from RRF, but also from Structural Funds and other European funding sources (e.g. Digital Europe). Based on the identified needs of the country, no significant funding gap has been currently identified for the implementation

of the above-mentioned projects, where the DMRID is the Implementing Authority. However, this need will be re-evaluated on a regular basis in order to avoid any lack of funding and ensure a smooth digital transition of CY in all four cardinal points.

All planned reforms and investments as well as the policies and measures that form an integral part of this National Roadmap are interconnected and expected to act complementarity towards a more digitalized Cypriot economy and society. Some characteristic examples of these interconnections are:

- the promotion of digital skills is expected to facilitate the digitalization process of businesses, since many trained citizens will be part of the active human resources ecosystem of the Cypriot businesses.
- the fast deployment of connectivity networks will act as a key facilitating factor for the digitalization of public services.
- the incorporation of new technologies and the digitalization of businesses will create a market need for more ICT professionals, since associated services such as the development, management and operation of digital systems, tools and applications will be deployed in companies and particularly SMEs in Cyprus
- the digitalization of public services will create a need for advanced connectivity, since citizens will gradually start using more the digital solutions for government and e-health services, avoiding outdated bureaucratic processes.

Overall, the swift implementation of the RRP actions and the roll out of several support schemes will serve as a catalyst for innovation and progress in the areas of the four cardinal points of the EU Digital Compass. At the same time, measures taken by Cyprus in the field of digital infrastructures will continue to help the EU become a strong market player in these areas.

IX. Annex 1 – List of Digital Decade 2030 KPIs

KPI	Definition
KPI 1	At least basic digital skills
KPI 2	ICT specialists in employment
KPI 3	Very High-Capacity Network (gigabit)
KPI 4	Fibre To the Premises (FTTP)
KPI 5	5G Coverage
KPI 6	Semiconductors
KPI 7	Edge nodes
KPI 8	Number of quantum computers
KPI 9	Take-up of cloud services by businesses
KPI 10	Take-up of big data by businesses
KPI 11	Take-up of AI by businesses
KPI 12	SMEs with at least basic digital intensity
KPI 13	Number of unicorns
KPI 14	Digitalization of public services for citizens
KPI 15	Digitalization of public services for businesses
KPI 16	eHealth composite indicator on the availability of electronic medical data
KPI 17	(1) MS that have notified at least one national eID scheme and (2) #MS that have provided access to secure privacy-enhancing eID via the European Digital Identity Wallet

X. Annex 2 – Digital Skills Programmes

Title	Numerical Target of trainees	Duration (hours)
AWS Fundamentals	128	6
AWS Cloud Practitioner - Foundational	96	12
AWS Solutions Architect - Associate	64	30
AWS Developer - Associate	64	40
Microsoft Azure Fundamentals	128	6
Microsoft Azure Data Fundamentals	96	6
Microsoft Azure AI Fundamentals	64	6
Microsoft Azure Administrator	64	40
Designing and Implementing a Data Science Solution on Microsoft Azure	64	40
Designing and implementing a Microsoft Azure AI Solution	64	40
Microsoft Power Platform Fundamentals	128	6
Microsoft Power Platform App Maker	64	30
Microsoft Power Platform Functional Consultant	64	30
Microsoft Power BI Data Analyst	64	30
Cybersecurity fundamentals	128	12
CompTIA Security+	64	40