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PART 18/27

COMMISSION STAFF WORKING DOCUMENT

Digital Decade 2025 country reports

Accompanying the document

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

State of the Digital Decade 2025: Keep building the EU's sovereignty and digital future

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European Commission

DIGITAL DECADE 2025
COUNTRY REPORTS

Luxembourg

Luxembourg

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Executive summary

Luxembourg continues to position itself as a strategic digital hub, backed by strong infrastructure but facing persistent challenges in SME digital uptake. The country asserts its role as a European frontrunner in digitalisation, notably through targeted investments in frontier technologies such as AI, quantum computing, and sovereign cloud.

Luxembourg shows a high level of ambition in its contribution to the Digital Decade having set 12 national targets, 100% of which are aligned with the EU 2030 targets. The country is following its trajectories well with 75% of them being on track (on the basis of the 2024 trajectories defined for all 8 KPIs analysed). Luxembourg addressed 71% of the 7 recommendations issued by the Commission in 2024, either by implementing significant policy changes (57%) or making some changes (14%) through new measures.

With nearly universal 5G and very high-capacity network (VHCN) coverage, the country sustains a high-performing digital environment. However significant disparities remain in cloud and data analytics adoption, particularly among SMEs. While Luxembourg's startup ecosystem is expanding, it remains constrained by limited access to private venture capital and a modest pipeline of scale-ups progressing toward unicorn status. In 2024, Luxembourg maintained strong performance in digital public services and digital skills, yet persistent gaps remain across age groups, gender, and levels of education. On sustainability, Luxembourg has launched targeted measures, but an integrated green-digital strategy is not yet fully articulated in the revised roadmap. Sovereignty and cybersecurity have emerged as central pillars of Luxembourg's digital strategy, with an increasing focus on sovereign cloud infrastructure, open-source security tools, and cross-border data resilience.

Digital Decade KPI (1)	Luxembourg				EU		Digital Decade target by 2030	
	DESI 2024 (year 2023)	DESI 2025 (year 2024)	Annual progress	National trajectory 2024 (3)	DESI 2025	Annual progress	LU	EU
Fixed Very High Capacity Network (VHCN) coverage	94.7%	95.2%	0.5%	97.5%	82.5%	4.9%	100.0%	100%
Fibre to the Premises (FTTP) coverage	78.9%	81.8%	3.7%	89.0%	69.2%	8.4%	100.0%	-
Overall 5G coverage	99.6%	99.6%	0.0%	97.4%	94.3%	5.9%	100.0%	100%
Edge Nodes (estimate)	10	20	100.0%	-	2257	90.5%	-	10000
SMEs with at least a basic level of digital intensity (2)	-	70.3%	3.0%	-	72.9%	2.8%	90.0%	90%
Cloud	32.6%	-	-	-	-	-	75.0%	75%
Artificial Intelligence	14.5%	23.7%	64.2%	40.6%	13.5%	67.2%	75.0%	75%
Data analytics	32.4%	-	-	-	-	-	75.0%	75%
AI or Cloud or Data analytics	52.0%	-	-	-	-	-	-	75%
Unicorns	2	2	0.0%	-	286	4.4%	-	500
At least basic digital skills	60.1%	-	-	-	-	-	80.0%	80%
ICT specialists	8.0%	8.0%	0.0%	8.3%	5.0%	4.2%	10.0%	~10%
eID scheme notification		Yes						
Digital public services for citizens	94.8	97.7	3.0%	96.7	82.3	3.6%	100.0	100
Digital public services for businesses	96.7	100.0	3.4%	97.9	86.2	0.9%	100.0	100
Access to e-Health records	76.1	76.1	0.0%	75.0	82.7	4.5%	100.0	100

(1) See the methodological note for the description of the indicators and other metrics
(2) DESI 2025 reports the version 4 of the Digital Intensity Index, that is comparable with the DII value from DESI 2023 (referring to year 2022) for the calculation of the annual progress. It is not comparable to the national trajectory that is based on version 3 of the index.
(3) National trajectory value if present in the national roadmap and if the indicator was measured in DESI2025 (year 2024)

According to the 2025 special Eurobarometer on 'the Digital Decade' 2025, 80% of Luxembourgish citizens consider that the digitalisation of daily public and private services is making their lives easier. On the action of the public authorities, 88% consider it important to counter and mitigate the issue of fake news and disinformation online. And on competitiveness, 86% consider it important to ensure that European companies can grow and become 'European Champions' able of competing globally.

A competitive, sovereign, and resilient EU based on technological leadership

Luxembourg's infrastructure performance remains well above the EU average, with near-universal coverage of VHCN, and 5G thanks to early and well-coordinated public strategies. However, the digitalisation of enterprises –particularly SMEs –lags behind, hindered by high integration costs and limited technical capacity. Despite this, Luxembourg shows leadership in AI and quantum computing, notably through the deployment of MeluXina-AI and its selection for the EU's AI Factories initiative. The adjusted roadmap includes measures to foster SME adoption of advanced technologies, including generative AI. While the startup ecosystem continues to grow, scale-up financing can rely on a number of public funding schemes but often struggle to access later-stage funding due to the small size of the market and a limited private risk capital culture. Sovereignty and cybersecurity remain central to Luxembourg's digital strategy, with ongoing efforts to reinforce sovereign cloud capabilities, promote open-source cybersecurity tools through the establishment of an Open Source Program Office (OSPO), and develop a national cybersecurity tools with dedicated sectoral safeguards, including for healthcare.

Protecting and empowering EU people and society

Luxembourg maintains high digital skills levels and has the second highest shares of ICT specialist employment in the EU. However, among people with at least a basic level of digital skills disparities persists between demographic groups, particularly by age and education. The country is a front-runner in digital public services, supported by mature platforms like MyGuichet.lu and centralised government IT architecture. Ongoing efforts focus on reducing administrative complexity and promoting sovereign digital solutions within the public sector, including GovCloud and open-source adoption. Although Luxembourg intends to step up its efforts to improve health data interoperability and availability, it continues to score below the EU average in access to eHealth records.

Leveraging digital transformation for a smart greening

Luxembourg is taking initial steps toward aligning digital and environmental transitions. While not yet underpinned by a fully integrated green-digital strategy, the country promotes a renewables-based and intelligent energy system, supports GovCloud sustainability, and is exploring the role of digital solutions in reducing emissions in mobility and industry. Participation in EU-level initiatives such as the Green Digital Coalition and IPCEI projects positions Luxembourg to further develop tools and metrics to measure and reduce the ICT sector's carbon footprint.

National Digital Decade strategic roadmap

Luxembourg submitted a fully revised national Digital Decade roadmap on 2 December 2024, containing more than 30 new or edited measures and revised trajectories. The roadmap notably strengthens the focus on SMEs and AI, with new support tools set to be launched in 2025. It addresses a substantial number of roadmap recommendations issued in 2024. A total of 98 measures are now

part of Luxembourg's national strategic roadmap with a budget of EUR 515 million, comprising EUR 488 million from public sector budgets, equivalent to 0.57% of Luxembourg's GDP in 2024.

Funding & projects for digital

Luxembourg allocates 38% of its total recovery and resilience plan to digital (EUR 24 million)[1]. In addition, under cohesion policy, EUR 6 million, representing 15% of the country's total Cohesion policy funding, is dedicated to advancing Luxembourg's digital transformation[2]. Luxembourg is a member of the three established EDICs; the Alliance for Language Technologies EDIC, the Local Digital Twins towards the CitiVERSE EDIC and of the EUROPEUM EDIC. Luxembourgish entities are indirect partners in the IPCEI on Next Generation Cloud Infrastructure and Services (IPCEI-CIS). Luxembourg is also a participating state of the EuroHPC Joint Undertaking (JU) and of the Chips JU.

The country has contributed to the Best Practice Accelerator[3] by sharing three best practices. Two of them are part of the Digital Skills cluster: the Girls in ICT Day national awareness action and Girls Deploy your Digital Talent. One has been shared in the Green IT Cluster: the Creation and promotion of Product Circularity Data Sheet (PCDS).

Digital Rights and Principles

According to a support study, Luxembourg has been one of the most active Member States in implementing the **European Declaration on Digital Rights and Principles**, with over 100 initiatives overall and 20 new initiatives launched in 2024. Luxembourg is most active in the area of digital education, training and skills. Less activity has been identified with regards to a fair digital environment. Measures in the area of putting people at the centre of the digital transformation appear to have most impact on the ground, in contrast to those addressing sustainability.

Recommendations

- **Digital Skills:** Scale up targeted programs to reach older citizens, women, and populations with lower education background.
- **SMEs:** Further support the uptake of advanced digital technologies (cloud, AI, data) by SMEs, who currently lag significantly behind larger enterprises.
- **Cybersecurity**: Continue efforts in cybersecurity to address evolving threats, particularly regarding employees' awareness.
- **Green**: Adopt an integrated green-digital strategy with measurable targets, leveraging EU tools to scale up low-carbon digital solutions, especially for SMEs, and implement a national framework to monitor ICT-enabled emission reductions across key sectors like energy, transport, and industry.
- **FTTP:** Explore targeted measures to increase take-up and extend coverage of FTTP in remaining underserved areas, ensuring that high-speed connectivity is accessible to all households.

[1] The share of financial allocations that contribute to digital objectives has been calculated using Annex VII to the Recovery and Resilience Facility Regulation. Last data update: 16 May 2025.

[2] This amount includes all investment specifically aimed at or substantially contributing to digital transformation in the 2021-2027 Cohesion policy programming period. The source funds are the European Regional Development Fund, the Cohesion Fund, the European Social Fund Plus, and the Just Transition Fund.

[3] The Best Practice Accelerator (BPA) is a platform that enables Member States to share successful measures and challenges encountered in their efforts to meet their Digital Decade targets and objectives. Best practices are made available to Member States via the BPA Repository and showcased in regular workshops, currently focused on three thematic clusters: Digital Skills, Green IT, and the Uptake of Digital Technologies.

- **Unicorns:** Strengthen the growth pipeline for scale-ups by facilitating greater access to private venture capital.

A competitive, sovereign and resilient EU based on technological leadership

Luxembourg is asserting itself as a strategic contributor to the Digital Decade by capitalising on its strong infrastructure, and targeted investments in emerging technologies such as AI, quantum technologies, and sovereign cloud. While its small size limits its capacity for achieving industrial scale, Luxembourg leverages its strengths as a highly connected and trusted environment to conduct a certain number of best practices and contribute to EU-wide digital resilience and innovation. The country's near-universal 5G and very high-capacity network (VHCN) coverage contributes to a robust environment for digital innovation. This ecosystem supports advanced initiatives such as the deployment of MeluXina-AI, a EUR 126 million supercomputer optimised for artificial intelligence, as well as the new associated Luxembourg AI Factory. According to the 2025 Eurobarometer[4], 87% of Luxembourgish people think that building efficient and secure digital infrastructures and data processing facilities should be a priority for the public authorities.

While labour productivity is among the highest in the EU, Luxembourg continues to face structural challenges in productivity growth. This is largely due to limited private investment in R&D and intangible assets, which constrains innovation-driven efficiency gains. Start-ups can rely on a number of public funding schemes but often struggle to access later-stage funding due to the small size of the market and a limited private risk capital culture.

To address these issues, the start-up ecosystem can rely on existing instruments such as the Digital Tech Fund (DTF) and Luxembourg Future Fund II. Such instruments have been complemented by new initiatives such as the 10-point action plan of March 2025, to further bolster start-ups, with EUR 300 million over the next five years. It introduces targeted tax credits for investments in young innovative firms, co-financing of up to EUR 200 000 for spin-offs, and enhanced employee stock option schemes to support scale-up growth. In addition to improving access to financing, the action plan aims to attract international talent, aligned with the 'From Seed to Scale' roadmap, and related initiatives. These include the launch of the Automobility Incubator in Bissen (December 2024), and a national scale-up programme. The Luxembourg Venture Days 2024 also attracted over 1 800 participants and more than 200 investors, reflecting growing ecosystem visibility.

While the startup ecosystem expands, SMEs still encounter significant barriers to digital adoption and AI integration. High entry costs, lack of technical capacity, and limited data interoperability are cited as major obstacles. To address this, Luxembourg launched Fit 4 Digital – AI in early 2025, with seven consultants already accredited and assisting SMEs with creating tailored digital transformation plans. The Ministry of the Economy also launched dedicated 'SME Packages' for cybersecurity and AI in March 2025, to help SMEs implement practical AI solutions and strengthen their resilience against cyber threats through easy-to-access support covering up to 70% of eligible costs.

[4] Special Eurobarometer 566 on 'the Digital Decade' 2025: https://digital-strategy.ec.europa.eu/en/news-redirect/883227

Building technological leadership: digital infrastructure and technologies

Luxembourg is a frontrunner in digital infrastructure deployment, with fibre and 5G networks already nearing full national coverage and significantly outperforming EU averages, though recent growth rates indicate a need to accelerate efforts to reach the target by 2030.

Connectivity infrastructure

Luxembourg's VHCN coverage for all households is significantly higher than the EU average. In 2024, it reached 95.2%, while the EU's coverage was 82.49% The country is on track according to its national trajectory. However, Luxembourg's growth rate of 0.5% lagged behind the EU's 4.9%. For households in sparsely populated areas, Luxembourg's coverage was 80.3% in 2023 and 82.8% in 2024, both higher than the respective EU average of 55.59% and 61.89%. Luxembourg's growth rate of 3.1% was lower than the EU's 11.3%.

Luxembourg is at 81.80% of FTTP coverage after a progression of 3.7% in 2024 and stands above the EU average of 69.24%. However, the growth rate was lower than the EU's 8.4% and the country is lagging behind compared to its national trajectory. For households in sparsely populated areas, Luxembourg's coverage was 61.9% in 2023 and 68.0% in 2024, both higher than the respective EU averages of 52.55% and 58.78%. At 9.9%, Luxembourg's growth rate was lower than the EU average of 11.9%.

Luxembourg's overall 5G coverage is exceptionally high. In 2024, total 5G coverage in Luxembourg was 99.6%, as in 2023, compared to the EU's 94.35%. The country is on track according to its national trajectory. For households in sparsely populated areas, Luxembourg's coverage was 96.8% in 2024, higher than the EU's 79.57%. Luxembourg's 5G coverage in the 3.4–3.8 GHz band is also above the EU average with 70.6% covered in 2024, while the EU's coverage was 67.72%. Luxembourg's growth rate of 11.9% was significantly lower than the EU's 32.6%. For households in sparsely populated areas, Luxembourg's coverage was 14.1% in 2024, lower than the EU's 26.19%. Regarding 5G spectrum, Luxembourg's assignment of harmonized spectrum in 5G pioneer bands was 60.83% in 2025 (same value as last year), below the EU's 74.63%

Luxembourg's broadband take-up indicators show a mixed performance compared to the EU average. In 2023, Luxembourg had 78.81% of fixed broadband subscriptions at speeds of 100 Mbps or more, surpassing the EU average of 65.9%. By 2024, this figure rose to 83.11%, still ahead of the EU's 71.88%. However, the growth rate for this indicator in Luxembourg was 5.5%, which is lower than the EU average of 9.1%. Luxembourg's share of fixed broadband subscriptions at speeds of 1 Gbps or more was 9.86% in 2023, below the EU average of 18.47%. In 2024, it increased to 15.14%, still behind the EU's 22.25%. Nevertheless, Luxembourg's growth rate of 53.5% outpaced the EU's 20.5%. The share of the population with 5G SIM cards was 114.71%[5] in Luxembourg in 2023, significantly higher than the EU average of 21.7%. This figure rose to 135.17% in 2024, also above the EU's 35.56%. However, the growth rate of 17.8% was significantly lower than the EU's 63.9%.

VHCN and FTTP

Luxembourg's VHCN and FTTP targets remain at 100%, as per the initial roadmap submitted in 2023. Given the latest good figures and the continued pace of roll-out, both VHCN target appear realistic.

[5] Note that the percentage of the population with 5G SIM cards can exceed 100% because people can have more than one SIM card.

However, for FTTP the latest performance, suggests that maintaining momentum will be crucial. As the current Ultra-high-speed broadband strategy is set to conclude in 2025, additional targeted measures may be needed to ensure full completion of the roll-out.

Luxembourg's national strategy for ultra-high-speed broadband (2021–2025) prioritises closing remaining coverage gaps, particularly in white spots. Authorities are closely monitoring deployment progress and evaluating potential market failures to determine whether additional public interventions will be necessary to achieve full FTTP coverage by 2030. For VHCN deployment, the main challenges are geographical — such as difficult topography and remote locations — and economic, particularly in relation to operator investment incentives. Monitoring efforts are coordinated by the Institut Luxembourgeois de Régulation (I.L.R), notably through detailed geographical mapping of VHCN coverage.

The copper network is being progressively phased out, with full migration to fibre expected by 2030. The I.L.R. has coordinated a public information campaign with telecom operators to ensure a smooth transition. Customers receive advance notice through a two-step letter process, and an online tool allows them to check switch-off impacts based on postal code.

Highlighting Luxembourg's broader shift towards automation and next-generation network management, POST Luxembourg, the country's state-owned telecom and postal operator, has partnered with Nokia to deploy Europe's first nationwide autonomous fibre network. The full transition to a software-defined access network is planned by the end of 2025. The aim is to increase operational efficiency, enable real-time fault detection, support energy management, and accelerate service innovation.

To boost take-up of fixed connectivity, Luxembourg launched a voucher scheme in 2023 targeting beneficiaries of social aid. In 2024, approximately 24 000 vouchers were issued, of which around 43% (10 200) were activated – an increase from 40% in 2023. The initiative has been extended into 2025 and aligns with Luxembourg's commitment to ensure universal and affordable high-speed digital connectivity under the European Declaration on Digital Rights and Principles.

Regarding spectrum policy, a **public consultation on key bands** (800 MHz, 900 MHz, 1 800 MHz, 2.6 GHz) ran from April to July 2024. It was open to all stakeholders and is currently under evaluation by the I.L.R. For now, **no new spectrum policy framework or regulatory changes** are envisaged.

5G

Following the roadmap adjustment, Luxembourg's 5G target remains at 100% with a completion date by 2030, as per the initial roadmap submitted in 2023. Given the latest solid figures and pace of roll-out, the target seems realistic.

Luxembourg continues to address the remaining challenges to achieving 100% 5G coverage by 2030, notably the difficulties faced in remote or topographically difficult areas and the high deployment costs for operators. Monitoring is ensured by the I.L.R through detailed regular 5G coverage reports.

Due to the country's small market size and limited number of infrastructure players, implementing certain EU toolbox for 5G security measures, like multi-vendor strategies, remains complex. Nevertheless, all national mobile networks deliver excellent non-HRV (high-risk vendors) connectivity and the Comité national des communications remains committed to liaising with them in order to push them to a higher level of resilience across all of their networks.

In 2024, the 5G MELUSINA initiative completed its inception study for cross-border rail coverage of the North Sea Mediterranean TEN-T corridor between Metz (France) and Luxembourg City (Luxembourg), with a strong interest by national actors' in moving toward implementation to enhance rail connectivity and operations.

2024 recommendation on connectivity infrastructure: Ensure sufficient access of new players to spectrum for innovative business-to-business (B2B) and business-to-consumer (B2C) applications and encourage operators to speed up the deployment of 5G stand-alone core networks.

In 2024, Luxembourg continued the implementation of existing measures but did not take any new measures. A public consultation on spectrum access (800 MHz, 900 MHz, 1800 MHz, 2.6 GHz) was held between April and July 2024, open to all stakeholders. However, no new spectrum policy framework or regulatory changes are foreseen at this stage. The consultation notably showed that there is still no commercial demand for the 26 GHz band. Regarding 5G standalone, there is no evidence of nationwide deployment by operators. Nonetheless, Luxembourg is supporting innovative use cases through the 5G MELUSINA project, which aims to deploy 5G along cross-border railway for enhanced connectivity. Further actions are needed to facilitate access for new players and accelerate standalone 5G core deployment.

Semiconductors

Luxembourg does not have a national semiconductor production strategy but supports EU objectives by contributing to niche areas of the value chain. The country currently hosts two companies active in semiconductor-related fields, notably in materials and coating technologies, and aims to increase this to four by 2030. No new measures were introduced in the 2024 roadmap, and support continues through monitoring and targeted RD&I funding.

Edge nodes

According to the Edge Nodes Observatory, Luxembourg is estimated to have deployed a total of 20 edge nodes by 2024, a progression of +100% since 2023. This is double the amount estimated for 2023 (10, number revised since SDDR 2024).

In its revised roadmap, Luxembourg did not provide a national target for edge nodes but continues to monitor the work on the definition of a methodology for the KPI assessment. The revised roadmap introduces additional details for the related existing measures. In 2024, Luxembourg advanced its edge-node deployment by preparing the publication of a full open-source technology and governance stack, including APIs, user management systems, contracts, and governance models. This work, scheduled for release between 2025 and 2026, aims to lower investment barriers and facilitate the large-scale roll-out of secure private, semi-public, and public edge nodes. Progress was also made under the Important Project of Common European Interest for Next-Generation Cloud Infrastructure and Services (IPCEI-CIS), with Luxembourg developing two cybersecurity-focused edge nodes for the European cybersecurity data space. Looking ahead, Luxembourg will launch sector-specific R&D&I calls aligned with GAIA-X standards to drive uptake in strategic sectors such as health, finance, and mobility. These measures, alongside continuous open-source publication efforts, are set to accelerate trusted edge-cloud deployment and strengthen cross-border interoperability through to 2030.

Quantum technologies

Luxembourg's national quantum strategy, by the beginning of 2025, focuses on integrating quantum technologies into its high-performance computing ecosystem and on developing a national quantum communication. Following a call launched by the EuroHPC Joint Undertaking in December 2023, Luxembourg was selected in 2024 to host a European quantum computer, which will be integrated with the national MeluXina supercomputer. In line with this strategic vision, the country also plans to deploy a quantum simulator connected to MeluXina.

Supporting EU-wide digital ecosystems and scaling up innovative enterprises

Luxembourg hosts a dynamic ecosystem of startups and scaleups, particularly in sectors such as fintech, healthtech, cleantech, and cybersecurity. However, a large share of enterprises – especially SMEs – still lag behind in adopting advanced digital technologies. Strengthening the diffusion of ICT capabilities across all firms, notably through tailored support for SMEs, would address structural bottlenecks in digital uptake and unlock productivity gains critical for sustaining inclusive economic growth.

SMEs with at least basic digital intensity

As of 2024, 70.27% of SMEs in Luxembourg reached at least a basic level of digital intensity, up from 66.25% in 2022[6], with an annual growth rate of 3.0%. Therefore, the degree of digital intensity of Luxembourgish SMEs was just below the EU average of 72.91%. Looking specifically at more digitally engaged SMEs, 34.02% had high or very high digital intensity, slightly exceeding the EU average of 32.66%. This indicates a relatively good level of digital engagement by SMEs in Luxembourg, though with room for further improvement to reach the EU averages and the Digital Decade target.

Luxembourg still aims for 90% of SMEs to have basic digital intensity, in line with the EU target for 2030. However, given current levels and uptake trends, this objective might be difficult to achieve, due to persistent uptake challenges, especially among the smallest firms. Structural barriers – such as limited internal capacity, cost sensitivity, and a lack of familiarity with advanced technologies – continue to hold back many SMEs. To address this, the revised roadmap introduces two major new SME-specific measures in the section related to the take-up of advanced technologies. Fit 4 Digital – AI supports SMEs in identifying relevant AI use cases, conducting feasibility studies, and drafting tailored implementation roadmaps. Several consultants, accredited by Luxinnovation, are already working directly with SMEs under this programme, and public co-funding is available to support implementation. The new SME Packages focusing on AI and cybersecurity extends existing aid schemes by providing financial support for concrete investments in AI and cybersecurity tools.

These measures complement existing tools such as Fit 4 Digital, which offers digital maturity assessments and co-funding for improvements in IT, cybersecurity, and software; and Fit 4 Innovation, which covers consultancy costs for operational audits to help SMEs redirect resources towards innovation. However, one persistent barrier remains: the fixed EUR 15 000 cost of a full operational audit under Fit 4 Innovation, which – despite public co-funding of 50% – can discourage smaller companies from participating. To address this, the government launched a reform of the Fit 4 programmes in 2024 to increase accessibility, improve promotion, and highlight successful use cases to build trust and engagement. Additional support tools include the SME Packages – Digital (supporting

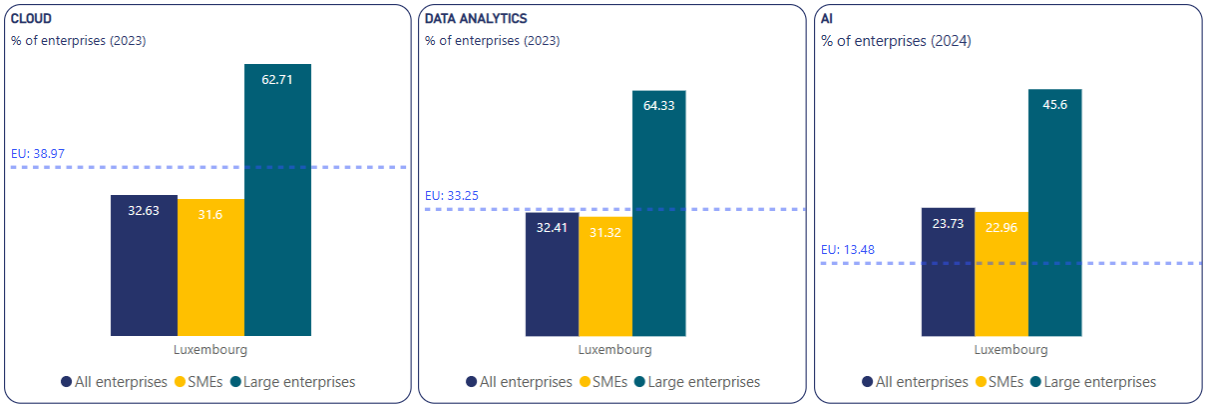
[6] 2022 is the last comparable year that used a similar methodology for measuring the digital intensity of enterprises.

digital marketing, business management tools, and e-invoicing, with guidance from certified advisors) and the continued operation of the Letzshop.lu platform, helping local retailers establish an online presence. Luxembourg is also developing an Open Cybersecurity Dataspace and open-source cybersecurity services to give SMEs access to secure, low-cost tools and data environments.

2024 recommendation on digitalisation of SMEs: Aim to reach the 2030 target by adopting further measures, when necessary, to convince less digitalised SMEs to engage in a digital transition to boost their growth.
Luxembourg addressed fully the recommendation by putting significant policy actions into place in 2024. The country notably launched new major SME-focused measures and initiated programme reforms to lower access barriers. While these actions show strong commitment, continued attention will be needed to engage less digitalised SMEs and accelerate progress towards the 2030 target.

In 2024, Luxembourg's **European Digital Innovation Hub L-DIH** continued supporting the digital transformation of the manufacturing sector, notably through AI and cybersecurity. It offers a combination of 'test before invest' services, training, and digital maturity assessments. Through a structured three-level approach – including awareness-raising Tech Talks, hands-on Tech Test workshops, and tailor-made support – manufacturing SMEs can trial digital solutions like AI, IoT, and augmented reality before investing, with co-financing options available to lower barriers and reduce the risks associated with adoption.

Take up of cloud/AI/data analytics



The latest available data shows that in 2024, 23.73% of enterprises in Luxembourg were using AI technology, significantly above the EU average of 13.48%. While this is an impressive 74.19% increase from 2023, when AI adoption was 14.45%, the country lags behind its national trajectory (40.63%). More specifically, 22.96% of SMEs in Luxembourg integrated AI solutions, whereas large enterprises had a higher uptake rate of 45.6%. This resulted in a 22.64 percentage point gap between SMEs and large enterprises, which was narrower than the EU-level gap of 28.53 percentage points. While Luxembourg demonstrates strong AI adoption compared to the EU, closing the adoption gap between SMEs and large enterprises remains crucial to ensuring widespread digital transformation.

Adoption of cloud, data analytics, and the three technologies together were not measured in 2024.

The latest available data shows that in 2023 cloud uptake in Luxembourg was 32.63%, falling short of the EU average of 38.97%. More specifically, among SMEs, the adoption rate was 31.6%, while that

of large enterprises was almost double (62.71%) used cloud services. This resulted in a difference of 31.11 percentage points in uptake between SMEs and large enterprises in Luxembourg, which was consistent with the EU-level gap.

In 2023, 32.41% of enterprises in Luxembourg performed data analytics, slightly lower than the EU average of 33.25%. Among these, SMEs had an adoption rate of 31.32%, while the percentage for large enterprises was significantly higher at 64.33%. This indicates a gap of 33.01 percentage points between SMEs and large enterprises, which is lower than the EU average gap of 39.72 percentage points.

According to the latest available data (2023), over 1 out of 2 enterprises (52.01%) in Luxembourg engaged with AI technologies, sophisticated or intermediate cloud computing services, or data analytics, just below the EU level uptake of 54.7%. More specifically, the uptake among SMEs was slightly lower at 50.96%, while large enterprises had a notably higher rate of 82.84%. This indicates a percentage point difference of 31.88 in uptake between SMEs and large enterprises in Luxembourg.

In conclusion the rate of adoption of cloud computing, data analytics, and AI technologies in Luxembourg was mixed compared to the EU averages, with particularly strong uptake of AI but slightly lower uptake of cloud services and data analytics. A significant disparity in technology adoption was observed between SMEs and large enterprises, with the latter exhibiting much higher uptake rates across all three technologies. Despite SMEs constituting most enterprises with 10 or more employees (95.6%) and contributing a larger share of the country's economic value added than large enterprises (44.3% vs 40.7%), their comparatively lower adoption rates indicate untapped potential for digital transformation. Bridging this adoption gap is vital for enhancing the overall digital maturity of Luxembourg's economy and sustaining its competitive edge within the EU.

In its adjusted roadmap, Luxembourg maintained its ambition for 2030, namely a 75% adoption rate of technologies by enterprises by 2030, in line with the EU target. While the ambition remains high, current uptake levels are significantly below target – particularly for cloud services, where adoption by businesses remains limited. The roadmap outlines a gradual acceleration starting from 2024, particularly for cloud services, once national platforms and SME-oriented applications are in place, and for AI, driven by the launch of Fit 4 Digital – AI and improved SME packages. These initiatives aim to lower barriers through feasibility studies, co-funding, and targeted outreach. However, given the slow uptake to date and the resource constraints of many SMEs, sustained effort and close monitoring will be needed to ensure the planned acceleration materialises and to avoid a last-minute push closer to 2030.

- **Cloud**

Luxembourg's target for Cloud uptake by enterprises remains at 75% by 2030. It is in line with the EU target. The updated roadmap confirms that while first implementation steps will begin in 2024, the significant impact on SME cloud adoption is only expected in the second half of the decade. By 2025, Luxembourg cloud providers will launch the first services adapted to national needs, including accounting, ERP, and tax tools. These applications will be designed for interoperability with government APIs and will ensure data portability. In parallel, the SME Packages have been extended to cover cloud and cybersecurity OPEX by the end of 2024. These foundational measures, while already outlined in earlier plans, are now entering an operational phase, with take-up expected to accelerate markedly from 2026 onwards.

On 4 February 2025, the CLAUSEN project – linked to the IPCEI-CIS – was formally launched by two ministers. It will implement an Open Cybersecurity Dataspace and set up a national Open Source

Promotion Office (OSPO). These structures will promote open-source tools developed by the Computer Incident Response Center Luxembourg (CIRCL) and the NC3 Cybersecurity Competence Center and facilitate access to trusted cloud and edge services beyond the direct IPCEI participants, including to SMEs. In addition, Luxembourg contributes to the IPCEI-CIS with open-source tools for Security operations centre (SOC) and Computer Security Incident Response Team (CSIRT) functions and technologies that preserve privacy and trade secrets, capable of running on edge nodes.

- **Data Analytics**

Luxembourg's target for Data Analytics take-up by enterprises remains at 75%. It is in line with the EU target by 2030. While no new standalone new measure for big data was introduced in the revised roadmap, the strategy to integrate it with SME cloud onboarding reflects a horizontal approach aimed at scaling analytics adoption through digital infrastructure investment.

- **Artificial Intelligence**

Luxembourg's target for Artificial Intelligence take-up by enterprises remains at 75%. It is in line with the EU target by 2030.

The adjusted roadmap introduces two new targeted measures to support AI adoption, especially among SMEs (see section above). The first one is Fit 4 Digital – AI, launched in February 2025, which helps SMEs identify AI use cases, conduct feasibility studies, and develop tailored roadmaps. The second one is the newly introduced SME Packages – AI, a financial support scheme aimed at co-funding concrete investments in AI tools and services, bundled under State aid rules. These two instruments are strategically coordinated to facilitate the implementation of the action plans emerging from the diagnostic phase. It builds on existing programmes and addresses key barriers such as cost, expertise, and technical readiness. While the policy shift is notable and well-aligned with the 2030 target, the adequacy of the approach will depend on sustained outreach, accessibility for smaller enterprises, and visible success stories to build trust and confidence in AI use.

A major milestone was reached in late 2024 with Luxembourg being selected to host one of the European 'AI Factories'. This will significantly accelerate the country's AI ambitions through the deployment of MeluXina-AI – a supercomputer optimised for artificial intelligence – and the creation of a dedicated AI Factory to drive innovation and application development in the years ahead.

The 2025 Eurobarometer shows that 85% of Luxembourgish people think that public authorities should prioritise shaping the development of Artificial Intelligence and other digital technologies to ensure that they respect our rights and values. It represents a big increase of 9 percentage points compared to last year, reflecting the growing interest of the citizens at this respect.

2024 recommendation on AI and Data Analytics: Consider further awareness-raising measures and/or training directed at SMEs to adopt AI and data analytics as means to boost competitiveness.
Luxembourg addressed fully the recommendation by putting significant policy actions into place in 2024. The country added two major new measures in its adjusted roadmap to support the adoption of AI by enterprises, strengthening SME capacity to adopt AI technologies competitively (described above). On data analytics, no information is available on measures taken to address the recommendation.

Unicorns, scale-ups and start-ups

At the beginning of 2025, Luxembourg had two unicorns - the same number as the previous year. Luxembourg has not set a national target for unicorns, acknowledging that its small market size and its role as a testbed for innovation make such forecasting particularly challenging. Many startups launched in Luxembourg scale their operations in larger EU markets, limiting the likelihood of unicorns emerging locally.

Although, Luxembourg did not introduce new measures in the revised roadmap it advanced on a number of existing policy actions, reinforcing their implementation and impact. The flagship **Fit 4 Start** acceleration programme, launched in 2015 and running in its 14th edition in 2024, remains a cornerstone of early-stage start-up support. It provides coaching and grant funding of up to EUR 150 000 for start-ups in digital technologies, healthtech, and space. In 2024, the programme received 429 applications from across the globe, reflecting its growing international visibility.

The country continued to implement 'From Seed to Scale' its strategic framework to boost the national scale-up ecosystem. Rather than duplicating existing support mechanisms like Fit 4 Start, this roadmap focuses on the next growth phase – helping high-potential start-ups become scale-ups and eventually global players. Key actions launched under 'From Seed to Scale' in 2024 include the Scaleup pilot programme, which supports companies with a strong team, proven traction, and international ambitions. Three Luxembourg-based firms were selected in the pilot's first round. The roadmap also guided the launch of the Automobility Incubator in Bissen, a dedicated facility designed for innovative mobility companies, offering 2 500 m² of R&D and co-working space.

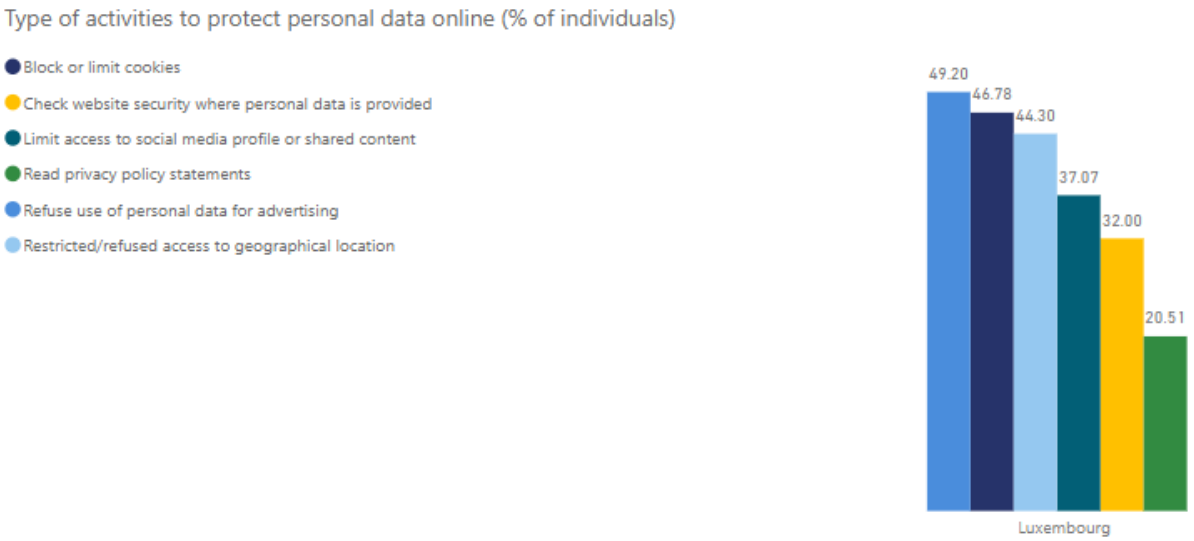
Furthermore, the roadmap supports the Luxembourg Venture Days, a major matchmaking event for start-ups, scale-ups, and investors. In 2024, the event gathered over 1 800 participants and more than 200 investors, underlining Luxembourg's emergence as a venture capital-friendly environment. Complementary instruments like the Digital Tech Fund (DTF), with nearly EUR 40 million in seed funding, and the Luxembourg Future Fund II further improve access to financing in strategic sectors such as fintech, cybersecurity, and space. In 2024, the DTF provided funding for 17 investments. The financed companies employ around 500 people in strategic sectors. However, limited market size, challenges in talent attraction, and high living costs continue to act as structural barriers to scaling locally. To address this, Luxembourg simplified access to public support in 2024 by standardising the Fit 4 programme family, while maintaining central roles for Luxinnovation and the L-DIH in guiding companies through digital and innovation funding opportunities. The national ecosystem now includes over 500 start-ups, with international visibility enhanced through platforms like Startup Luxembourg and events such as the Luxembourg Venture Days. Altogether, this coordinated policy mix is steadily reinforcing the country's profile as a dynamic and investor-ready innovation hub in Europe.

Strengthening Cybersecurity & Resilience

In Luxembourg, 3 out of 4 (75.49%) people took at least one action to protect their data online, exceeding the EU average of 69.55% [7]. More specifically, 44.16% took three or more actions (deeming them as having above basic digital safety skills). Refusing the use of personal data for advertising was

[7] Most of the indicators mentioned in the country report are explained in the DESI 2025 Methodological Note accompanying the State of the Digital Decade report 2025.

the most common measure (49.2%), while reading privacy policy statements was the least frequent (20.51%).



Luxembourgish enterprises tend to experience less incidents related to cyberattacks, but employees are less aware of their ICT security related obligations compared to the EU average. The number of enterprises that experienced ICT security incidents leading to unavailability of ICT services due to attack from outside (e.g. ransomware attacks, denial of service attacks) dropped slightly from 4.34% in 2022 to 3.34% in 2024 thus falling below the European average (3.43%). In addition, Luxembourgish enterprises are less prone to incidents related to hardware or software failures (13.01%) than their EU peers (17.97%). In terms of measures, 86.80% of enterprises deployed some ICT security measures (below the EU average of 92.76%) and only 54.12% made their employees aware of their obligations in ICT security related issues, below the EU average (59.97%).

Luxembourg is among the EU leaders in the roll-out of the secure Internet Protocol version 6 (IPv6) for end users. Concerning the deployment of secure internet standards, Luxembourg is performing well in the roll-out of IPv6 for end users (40%, vs an EU average of 36%) and is slightly above the EU average on the server side (24%, vs an EU average of 17%). IPv6 is an important protocol as it ensures the scalability, stability, and security of the Internet. The deployment of this new version is increasingly urgent, as traditional IPv4 addresses have been long depleted. Domain Name System Security Extensions (DNSSEC) is also an important standard to be rolled out as it introduces security features to DNS. In Luxembourg, the DNSSEC validation rate (i.e. verification of the authenticity of responses sent by name servers to clients, using a digital signature technology) is 83% (Q3 2024), well above the EU average of 47%.

According to the Digital Decade Eurobarometer 2025, 87% of Luxembourgish citizens think that an improved cybersecurity, better protection of online data and safety of digital technologies would facilitate their daily use of digital technologies.

Luxembourg's cybersecurity strategy takes a multi-layered, sector-specific approach, combining regulatory alignment, institutional capacity building, and public-private collaboration. For SMEs, the strategy relies on awareness-raising campaigns and practical tools such as the SME Packages – Cybersecurity, launched in March 2025, to offer subsidised access to secure digital tools. These

packages are deployed in cooperation with the House of Entrepreneurship, the Chambre des Métiers, and the Luxembourg House of Cybersecurity (LHC), and are complemented by events such as the 'Future Ready Days' focused on AI and cybersecurity.

On 4 February 2025, the 'CLAUSEN' project, led by the Luxembourg House of Cybersecurity (LHC), was officially launched with two ministers signing the contract. The project will now begin to implement the Open Cybersecurity Dataspace and establishing the Open Source Promotion Office (OSPO), both set to be operational in 2025. The OSPO will promote open-source tools developed by LHC entities CIRCL and NC3 Cybersecurity Competence Centre and will also play a key role in the European Cybersecurity AI Factory coordinated by the LHC.

In the healthcare sector, Luxembourg's strategy prioritises alignment with the GDPR, the upcoming European Health Data Space (EHDS) regulation, and the requirements of the NIS2 Directive, whose national transposition is currently underway. This is complemented by strong incident response systems, high-end authentication, encryption of sensitive data, and systematic audits. Collaboration with cybersecurity entities helps healthcare institutions remain updated on evolving threats. The effectiveness of these actions will be measured through indicators such as reduced incident frequency, faster response times, and improved compliance and staff awareness.

On the skills and awareness front, initiatives range from expert training to public campaigns. The national **BEE SECURE** programme – highlighted as a best practice in last year's Digital Decade report – continues to provide cyber awareness trainings, activities and resources for children, families, and educators. For professionals, cybersecurity skills are developed through programmes embedded in national digital upskilling strategies and partnerships led by the LHC.

Protecting and empowering EU people and society

Empowering people and bringing the digital transformation closer to their needs

Luxembourg approaches digitalisation with a strong emphasis on inclusiveness, targeting persistent divides in gender, age, education, and socio-economic background. Although the country performs above the EU average in digital skills overall, disparities remain – most notably between men and women, and between higher- and lower-educated individuals. In response, the revised roadmap includes expanded partnerships with civil society, tailored digital literacy programmes, and new tools for different learning contexts. The labour market benefits from the Skillsbridges initiative and targeted actions to attract more women into ICT careers, yet the stagnation in ICT specialist growth and declining share of women in tech highlight persisting challenges. Luxembourg is expanding the accessibility of public services through measures such as the new Digital Mandate and a redesigned Guichet.lu interface, structured around life events, simplified language, and inclusive access tools. Luxembourg also maintains a strong focus on child protection and online safety through structured initiatives such as BEE SECURE. While civic engagement online is not explicitly addressed, the country's efforts towards digital equity put in a good position to ensure that the benefits of digitalisation are shared across all societal groups. Moreover, according to the 2025 Eurobarometer, 84% of Luxembourgish people think that accessing public services online will be important for their daily life in 2030. Concerning human support to help access and use digital technologies and services, 74% consider it would improve their daily use of digital technologies, and 91% think public authorities should consider it important to ensure that people receive proper human support to help them adapt to the changes in their lives brought about by digital technologies and services.

Equipping people with digital skills

Basic Digital Skills

In 2023, Luxembourg stood above the EU average, with 60.14% of its population proficient in basic digital skills. Without updated data for 2024, analysing different demographics offers valuable information.

- **Gender Gap:** Luxembourg has a notable gender gap with 63.60% of men and 56.56% of women having basic digital skills, creating a 7.04 percentage point disparity. This gap is significantly larger than the EU average (2.23pp), pointing to scope for improvement.
- **Education Level:** The correlation between education and digital skills is clear in Luxembourg. For those with higher education, the proficiency rate stands at 79.68%, on par with the EU average (79.83%). Those with no or low formal education have a much lower proficiency rate at 31.70%, with a gap of 28.44 percentage points from the national average, which is wider than the EU average gap (21.95pp).
- **Living Areas:** Residents in towns and suburbs of Luxembourg have the lowest levels of basic digital skills at 56.42%, still above the EU average for those areas. The gap between these residents and the national average is 3.72 percentage points, which is marginally higher than the EU average, the country being quite homogeneous in this dimension

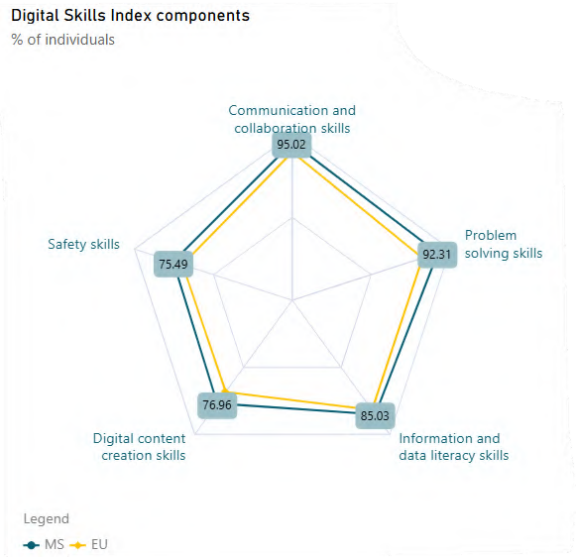
- **Age Groups:** Interestingly 35-44-year-olds are the most digitally skilled age group in Luxembourg, with a 70.80% proficiency rate, surpassing the EU average (65.26%). The youngest (16-24-year-olds) have a 59.66% proficiency rate and are lagging behind the EU average for this age group (69.98%). The least skilled are the 65-74-year-olds at 39.26%, but this group is above the EU average for their age cohort (28.19%).
- **Digital Skills Index components:** Luxembourg excels in the Digital Skills Index competencies, scoring above the EU average in all five areas. It boasts the highest score in communication and collaboration skills at 95.02%, significantly outperforming the EU average. Its lowest score is in safety skills at 75.49%, which is still above the EU average.

In summary, Luxembourg's digital skills landscape is strong, particularly in communication and problem solving. Despite the high overall digital proficiency, there is a clear need to address the gender gap and support lower-educated individuals. With its solid performance across all skill areas, Luxembourg is well-positioned to tackle these challenges and continue to enhance its digital capabilities.

Luxembourg's target for the basic digital skills of the population remains at 80% by 2030, in line with the EU target. In its revised roadmap, Luxembourg introduces several new measures towards achieving this target and expanding access to upskilling opportunities to all population segments, expanding partnerships and diversifying its training offer.

Several new or renewed agreements have been introduced to enhance inclusiveness and tailored learning, including cooperation with the non-profit organisations Digital Inclusion and GoldenMe, which target vulnerable groups: migrants and older adults respectively. Participants notably learn how to use Windows, set up and use an email account, browse the internet and use myGuichet and other common online services in Luxembourg.

To raise awareness and engagement in a variety of settings, Luxembourg has developed new learning formats adapted to different age groups and learning contexts These include 'Big Data Life', an interactive tool introducing children and young adults to online privacy issues, and the 'Changemaker Games', a hybrid escape game designed to encourage critical thinking about responsible consumption among secondary school pupils.



In 2024, Luxembourg's employment agency ADEM ran two full-time digital skills programmes to support jobseekers. The *Basic Digital Skills* course helped adults over 30, while *Digital Fundamentals* targeted those aged 16 to 29. Together, they trained nearly 150 participants - with a female participation of 70% in the former and 45% in the latter - in essential digital tools for today's job market.

In addition, the Skillsbridges programmes, launched in September 2024, aim to address the shortage of qualified labour and support professional transitions with courses covering areas such as artificial intelligence, data analysis, cloud computing, and e-marketing. The courses show strong early demand

and promising results, with high registration rates, waiting lists, and completion rates between 71% and 92%, indicating effective alignment with labour market needs and strong participant engagement. Furthermore, the Ministry for Digitalisation launched an online trainer platform and supports monthly IT trainer meetups with ErwuesseBildung to foster a national network of digital educators and amplify local training capacity.

Finally, the government Zesummendigital platform, centralises information on digital inclusion initiatives, key stakeholders, and educational resources in Luxembourg. It also provides awareness tools and self-help materials to promote digital inclusion for all audiences.

While these developments reflect a strong commitment to inclusivity and innovation, the roadmap also recognises persistent challenges such as the gender digital divide and lower uptake among older populations. Ensuring adequacy will thus require continued efforts to scale, evaluate, and adjust these measures to meet the evolving needs of all demographic groups.

2024 recommendation on basic digital skills: Strengthen the strategy to develop the population's basic digital skills.

Luxembourg addressed fully the recommendation by putting significant policy actions into place in 2024. The country added six new measures on basic digital skills to its revised roadmap. Initiatives continue across formal and non-formal education for children and students, including new measures on digital responsibility and privacy. For older people, ongoing workshops are under way to support digital inclusion. The workforce benefits from expanded training via *Skillsbridges*, and jobseekers are supported through tailored courses such as *Basic Digital Skills* and *Digital Fundamentals*. These actions are complemented by the implementation of the OECD Skills Strategy for Luxembourg.

ICT specialists

In Luxembourg, the percentage of ICT specialists as a share of total employment was 8.0% in both 2023 and 2024, which was higher than the EU's 4.8% and 5.0% respectively. The country is on track according to its national trajectory. However, Luxembourg recorded no growth in this area (0.0%), compared to the EU average of 4.2%.

Regarding the gender distribution among ICT specialists, Luxembourg had 22.5% of women ICT specialists in 2023, higher than the EU average of 19.4%. However, by 2024, this figure dropped to 17.4%, below the EU average of 19.5%. The growth rate for women ICT specialists in Luxembourg was -22.7%, significantly lower than the EU average of 0.5%. In 2022, the percentage of enterprises providing ICT training was 21.84%, lower than the EU average of 22.37%. However, by 2024, Luxembourg's figure rose to 24.84%, surpassing the EU's 22.29%. The annual growth rate for Luxembourg in this area was 6.6%, significantly higher than the EU average of -0.2%.

Luxembourg's ICT training sector is on a positive trajectory, with a robust annual growth rate. However, the stagnation in the growth of ICT specialists and the decline in the percentage of women ICT specialists are areas of concern. Policies aimed at fostering growth in the ICT specialist sector and promoting gender diversity are essential to ensure Luxembourg's competitiveness and inclusivity in the ICT landscape.

In terms of demand from the labour market, Eurostat experimental statistics based on web scraping show that in Luxembourg, the profiles of 'software and applications developers and analysts' are the

most sought after, representing 62.6% of online job advertisements for ICT specialists (58.0% at EU level). In addition to this dominant group, two other profiles are in higher demand in Luxembourg than in the EU on average: 'information and communications technology operations and user support technicians' (14.0%), and 'Database and network professionals' (11.6%).

Luxembourg still aims to have 10% of ICT specialists in employment by 2030, in line with the EU target. In response to challenges such as skills shortages and gender imbalance in the digital sector, the revised roadmap introduces two targeted measures to strengthen the national pipeline of ICT professionals. First, the law of 7 August 2023 (in force since 1 September) introduced key changes to simplify the employment of third-country nationals already residing in Luxembourg. A central tool is ADEM's annually published **List of Professions Facing Significant Shortages**, based on objective labour market indicators such as vacancies, jobseeker availability, and unfilled positions. For professions on this list, the labour market test is waived, and a certificate is issued within five days – streamlining recruitment for in-demand roles like ICT specialists. This marks a strategic shift toward more data-driven and responsive workforce planning, aligning migration and training policies with real economic needs. This data-driven approach also marks a strategic shift towards proactive workforce planning, helping to ensure that ICT education and upskilling efforts translate into tangible labour market outcomes. Second, the measure **ICT specialists and gender convergence: motivate girls for STEM** – co-steered by the Department of Media, Connectivity and Digital Policy (SMC), together with the Ministry of Equality (MEGA), the Ministry of Education, the '*Maison de l'orientation*' and IMS Luxembourg - introduces dedicated mentoring and hands-on experiences for girls aged 15–16 through partnerships between schools and employers. By involving female students in real-world STEM challenges under the guidance of professionals, the initiative addresses gendered stereotypes early in the educational pipeline and seeks to build long-term interest in ICT careers. Both measures respond directly to gaps identified in past assessments and reflect a maturing strategy that couples structural insights with inclusive interventions. Their adequacy will depend on effective implementation, particularly in ensuring uptake across sectors and sustained cooperation between ministries, schools, and industry actors.

To complement the new measures set out in the roadmap, Luxembourg is stepping up efforts to address gender disparities in ICT careers. Several initiatives are underway: support sessions for women in career transitions (MEGA, WIDEANDCO SIS), Business Intelligence Academy courses for non-tech women (WeSTEM+), and women-only groups in the 'Elements of AI' program, where participation by women averages around 50%. Moreover, the study '*Identifier les causes de la faible présence des filles et des femmes dans les filières et les métiers de l'ICT*' presented during the Girls in ICT Day 2025, conducted by WIDEANDCO SIS on behalf of MEGA, highlights the need for role models and inclusive teaching. MEGA also organises school workshops promoting gender equality in digital fields. As a follow-up to the successful Girls in ICT Day 2025 round table, Luxembourg prepares a wider outreach format entitled '*Femmes & Tech: Dialogues inspirants*'. This initiative will create structured but informal encounters between female professionals and secondary school pupils, including parents and teachers, to encourage dialogue and show perspectives on careers in and with ICT. The format draws inspiration from Digital Decade best practices such as Croatia's 'Women in Digital'. Launch is foreseen during the 2025/26 school year.

Luxembourg also continues to implement targeted measures to expand Luxembourg's pool of expert digital professionals. In 2024, ADEM significantly expanded its training offer for jobseekers aiming to upskill or reskill into technical ICT roles. One of the flagship programmes is the *42 Luxembourg School*, operated by the Digital Learning Hub (DLH), which enabled 130 jobseekers in 2024 to undertake an

intensive coding training designed to prepare them for careers in software development. Furthermore, 2500 jobseekers participated in various DLH trainings, aimed at increasing access to fast evolving digital domains. Overall, in 2024, the DLH delivered 397 courses across key areas such as cybersecurity, artificial intelligence, blockchain, data science, programming, and IT administration, attracting over 4,000 enrolments, with 44% of participants being women. ADEM also collaborated with the CNFPC on a 4-month Full Stack/Web Developer programme for 30 participants and launched the *'e-Services 4 Inclusion'* training with JWAY, supporting 35 jobseekers in low-code/no-code tools for digital services.

Advanced training opportunities are reinforced through master's programmes at the University of Luxembourg in key subjects such as cybersecurity, data science, high-performance computing, and information systems security. These initiatives aim to strengthen Luxembourg's strategic capabilities in high-tech and sovereign digital infrastructures.

Key digital public services and solutions – trusted, user-friendly, and accessible to all

In 2024, Luxembourg's total score for digital public services for citizens was 97.66, surpassing the EU average score of 82.32, with a growth rate of 3.0% lower than the EU's 3.6%. The country is on track according to its national trajectory. For cross-border digital public services for citizens, Luxembourg scored 95.36 in 2023 and 98.57 in 2024, both higher than the EU averages of 68.37 and 71.28, respectively. Yet, Luxembourg's growth rate of 3.4% was lower than the EU average of 4.3%. However, the share of people using government internet websites or apps is decreasing in Luxembourg, from 90.89% in 2022 to 88.38% in 2024, but it remains far above the EU average of 74.71% in 2024.

In the realm of digital public services for businesses, Luxembourg's reached a perfect score of 100.0 in 2024, significantly higher than the EU average score of 86.23. The country is on track according to its national trajectory. For cross-border digital public services for businesses, Luxembourg scored 93.33 in 2023 and a perfect 100.0 in 2024, higher than the EU averages of 73.13 and 73.76, respectively. Luxembourg's growth rate of 7.1% significantly exceeded the EU average of 0.9%.

Regarding access to e-health records, Luxembourg's total score was 76.1 in both 2023 and 2024, falling short of the EU averages of 79.12 and 82.7, respectively. Although the country is on track according to its national trajectory, Luxembourg experienced no growth between 2023 and 2024, while average growth in the EU was 4.5%.

e-ID

In 2023, 75.30% of Luxembourgish people had used their eID to access online services for private purpose in the last 12 months (53.97% for the business sector), which is above the EU average (41.11%). By the end of 2024, the GouvID application had been downloaded 91,792 times (or by 14% of the country's population, compared to 9% end of 2023). Luxembourg's electronic signature verification and validation platform has been operational since April 2024, enabling state agents to securely verify eIDAS-compliant electronic signatures, stamps, and timestamps, thus supporting the uptake of end-to-end digital administrative procedures for citizens and businesses.

Luxembourg is actively advancing on its national implementation of the EU Digital Identity Wallet (EUDI Wallet) in line with the amended eIDAS Regulation. Following the strategic decision to discontinue the national e-wallet project due to legal and timing constraints, the country now focuses on delivering a minimum viable product (MVP) of the EUDI Wallet. This MVP, expected to be tested and refined by mid-2025 within the large-scale pilot POTENTIAL, will progressively integrate the full set of functionalities required under EU law. Once certified, the Wallet will provide citizens with secure,

interoperable access to electronic identity services and a broad range of attribute attestations across the EU.

Luxembourg is leading the work on identification for e-government services within the Advanced Project for Trusted Identity Technologies and Unified Digital Ecosystem (APTITUDE) that will pilot the usage of EUDI Wallets. The country is also working on identification for bank account opening, the mobile driving licence (mDL) and remote qualified electronic signatures.

Digitalisation of public services for citizens and businesses

Luxembourg still aims to achieve a score of 100 for the digitalisation of public services for citizen and businesses. Given the status of ongoing projects and strategic priorities, it is expected that Luxembourg will reach the Digital Decade target by 2030.

In the adjusted roadmap, two genuinely new measures have been introduced. First, the introduction of a **Digital Mandate** aims to extend the benefits of digital public services to individuals who face barriers to accessing online procedures—whether due to limited digital skills, lack of equipment, or personal preference—by enabling them to securely delegate administrative tasks to a trusted person via MyGuichet.lu. This system, whose first iteration for able adults is planned for the end of 2025, will gradually be extended to other user groups, including individuals under guardianship or curatorship and surviving relatives, thereby fostering inclusive access to fast, user-friendly, and efficient eGovernment services. In parallel, Luxembourg carried out several actions in 2024 to enhance public awareness and accessibility of its digital services, including a major redesign of Guichet.lu with content structured by life events and easy-to-read sections in simplified French and German. Accessibility features such as adjustable displays and text readers were added. New tools like a virtual meeting room and a chatbot for appointment booking were also deployed. By the end of 2024, Guichet.lu had recorded 516 182 private spaces (+11.7% compared to the end of 2023) and 130 207 professional spaces (+15.7%). The MyGuichet.lu application had been downloaded 481 041 times (+28.8% over one year). Furthermore, a national consultation involving 7 889 citizens was launched to guide the creation of local service desks, ensuring human support remains available for those less comfortable with digital channels.

The second new measure in the roadmap is the draft law on the use of data in a trusted environment and focusing on the national implementation of the 'once only' principle. It complements the implementation of the EU Data Governance Act with national provisions, creating a comprehensive legal and operational framework for the reuse of public sector data in a trusted environment. It establishes the basis for a national interoperability programme, including a harmonised public data inventory, a semantic repository, and a single point of access to public data. The bill also supports flagship projects such as the automation of procedures related to births and deaths, and the systematisation of the 'Once Only' approach on the national single digital gateway. **Its adoption, expected by end 2025, is expected to significantly reduce administrative burden and accelerate data-driven public service delivery.**

Luxembourg actively strengthens the sovereignty of its public services by prioritising national and European digital solutions. The Luxembourg National Data Service (LNDS), operational since 2023, facilitates the secure secondary use of public sector data for innovation, with over 60 staff and strong public-private cooperation. The national Luxchat system, based on open-source French technology, enhances secure mobile communication across government, businesses, and citizens. Additionally, the

GovCloud infrastructure, operated by the Government IT Centre, offers a sovereign, energy-efficient 'as-a-service' model to public administrations.

e-Health

Luxembourg still aims at a score of 100 for the access to medical records, in line with the 2030 EU target. However, the score hasn't changed since last year, so sustained efforts seem necessary.

The country did not include any new measures in its adjusted roadmap.

On eSanté, the number of patient accounts is 209 299 as of 31 March 2025, with an average of 3 749 activated per month. The agency also lists 1.2 million DSPs (*Dossier de soins partagé*), of which only half are affiliated to Luxembourg residents.

According to the 2025 Eurobarometer, 73% of Luxembourgish people think that digital technologies will be important when accessing or receiving healthcare services (e.g., telemedicine, artificial intelligence for diagnosis diseases) during their daily life by 2030.

2024 recommendation on e-Health: (i) Make the data types of e-prescription and e-dispensation available to people through the online access service; (ii) Ensure that all data types are made available in a timely manner; (iii) Enhance the authentication method for logging into the online access service by using a notified e-ID; (vi) Increase the supply of health data by onboarding more categories of healthcare providers

Luxembourg made some efforts to address the recommendation through new policy actions in 2024.

The roll-out of ePrescription and eDispensation is planned as part of the implementation of the EHDS regulation and Luxembourg's participation in the EU4Health programme. A new digital health strategy, still under development, will align with EHDS requirements and prioritise the timely availability of key health data categories, such as patient summaries, prescriptions, imaging, and lab results. Work is also underway to strengthen authentication by allowing patients to access services through a central e-ID-supported portal. Finally, increasing the supply of health data by onboarding more healthcare providers is a key objective of the upcoming strategy. However, as the strategy is still being finalised, no concrete outcomes were achieved in 2024, and regular coordination with healthcare providers continues in preparation.

Building a safe and human centric digital environment and preserving our democracy

In Luxembourg, online participation in political and civic life is rising. In 2024, 24.36% of people used the internet to participate in consultations, to vote or to share opinions online. This share is above the EU average (20.45%) and trending upward (21.47% in 2022).

To further improve democratic processes, the government has announced an analysis phase, under the 2023-2028 coalition agreement, to explore the secure and simplified implementation of electronic voting in polling stations. This would mark a significant step towards digital electoral innovation while preserving election integrity.

It is worth mentioning that Luxembourg's Parliament has adopted the Digital Services Act (DSA), aligning with EU efforts to create a safer and more transparent online environment. The DSA bans

targeted advertising to minors, strengthens tools to report illegal content, and increases algorithm transparency. The Luxembourg Competition Authority will oversee enforcement, with powers to investigate and fine violations up to 6% of global turnover. It will coordinate implementation with national authorities, such as the '*Commission nationale pour la protection des données'* (CNPD), under a cooperation agreement signed on 11 March 2025.

In 2025, Luxembourg's central bank and the ECB had to face a surge of disinformation around the digital euro, fuelling public confusion and scepticism. This highlighted the urgent need to strengthen resilience against disinformation, prompting Luxembourg to launch broader public awareness and education initiatives.

To address such challenges, Luxembourg has continued to take multifaceted measures to target disinformation. Luxembourg partners with the EDMO Belux observatory to ensure access to fact-checking services and multilingual educational resources. Furthermore, legal instruments like the Press Aid Law (2021) and the Law on Freedom of Expression in the Media uphold journalistic integrity, while the Consumer Code and Criminal Code address misleading content and reputational harm.

BEE SECURE, the national Safer Internet Centre, leads large-scale public awareness campaigns. Its 2024/25 campaign 'Monkey see – monkey do' focused on AI-generated disinformation, especially in the context of political elections. Through multimedia content and public displays, it educated citizens – particularly youth – on the risks of deepfakes and how to recognize manipulated media. In schools, over 1 200 digital safety training sessions were conducted in 2024 alone, including specific modules on disinformation like 'check your facts', requested more than 400 times for grades 8 and 9 since 2022. Due to the high demand, the training module has been upgraded and updated. It will be offered under the name Fact Check – Safe and Sound starting with the 2025/2026 school year.

Protecting minors remains a top priority. Luxembourg implements age-appropriate awareness measures, such as the National Action Plan '*sécher.digital*' launched by the Ministry of Education, Children and Youth for the 2024/2025 school year. It promotes a balanced and responsible digital culture in schools, focusing on digital well-being, AI literacy, digital skills, and administrative simplification. BEE SECURE's Stopline platform enables anonymous reporting of illegal content, and a dedicated helpline offers support to parents, educators, and children.

Data from 2023 confirms the relevance of these actions. Nearly half (45.82%) of Luxembourg residents encountered hostile or degrading online messages, with youth aged 16-24 particularly affected (58.35%). Moreover, 63.4% of individuals reported exposure to dubious online content, and 40.29% verified its accuracy – indicating a relatively strong culture of critical engagement. Young people not only experienced more disinformation (74.05%) but also checked sources more often (48.23%) than adults (41.52%).

According to the Digital Decade Eurobarometer 2025, Luxembourgish people strongly think that the action of the public authorities is urgent to protect children online regarding the negative impact of social media on children's mental health (97% of Luxembourgish people), cyberbullying and online harassment (97%) and to put in place age assurance mechanisms to restrict age-inappropriate content (95%).

Leveraging digital transformation for a smart greening

Luxembourg prioritises the green transition, linking it to digitalisation through targeted initiatives. Energy, SMEs, and agriculture benefit from digital platforms and tools supporting sustainability, circular economy, and climate resilience, reflecting a cross-sectoral approach to a greener, more competitive economy.

Regarding the awareness of its population, in 2024, a quarter of Luxembourg's population (25.73%) considered energy efficiency to be important when purchasing ICT devices (EU: 19.35%) but the eco-design of the device was considered important by only 10.81%, below the EU average of 12.04%. However, those two eco-friendly criteria are far less important to buyers than the price, the performance, and the design of the ICT device.

Luxembourgers tend to recycle more their laptop (12.84%), mobile phone (11.48%) and desktop devices (16.18%) than the EU average (11.31%, 10.93%, and 14.66% respectively).

In April 2024, the Ministry for Digitalisation handed over 334 laptops, collected by the '*Centre des technologies de l'information de l'État*' (CTIE) from various public entities, to the Digital Inclusion association. Digital Inclusion will refurbish the devices and distribute them to people who request the association's help.

In its revised roadmap, Luxembourg has added five new measures in order to twin the green and digital transition. Among these, the 'SME Packages – Sustainability' programme empowers SMEs to lower their environmental footprint by improving energy and water efficiency, enhancing waste management, and carrying out carbon assessments. Beneficiaries can access to a state aid of 70% of eligible costs between EUR 3 000 excl. VAT and EUR 25 000 excl. VAT, for implementing sustainable solutions, often complemented by digital tools to optimise customer communication and internal processes. Similarly, the '**Fit 4 Sustainability**' programme provides SMEs with comprehensive environmental diagnostics – covering decarbonisation, water use, and product life cycle analysis – followed by tailored recommendations and potential investment support to implement these changes.

Complementing these measures, the Product Circularity Data Sheet (PCDS) initiative led by *Terra Matters G.I.E.*, established by the Ministry of the Economy and the Chamber of Commerce, introduces a trustworthy system for managing circular product data. By facilitating third-party verification of circularity claims, it aims to increase transparency and trust across digital product value chains and promote responsible consumption.

In agriculture, Luxembourg is leveraging digital technology to drive green transformation. The MA-eFaST project focuses on integrating databases to optimise nutrient management, reducing nitrogen loss and the need for chemical fertilisers, thus cutting greenhouse gas emissions. Meanwhile, the ADAPT project explores smart cropping techniques – like intercropping, reduced tillage, and cover crops – to mitigate emissions and preserve soil carbon. By combining real-world testing with modelling and regional climate projections, ADAPT aims to guide farmers with data-driven advice for climate-resilient farming practices across the country.

Regarding existing measure in the previous roadmap, on 20 March 2025, Luxembourg launched *Leneda,* its national Energy Data Platform, developed by Creos Luxembourg. Mandated by law, Leneda

centralises electricity and gas data, supporting the green-digital transition by improving data accessibility, transparency, and efficiency. It offers secure access to near real-time consumption and production data, trusted data sharing, and unique Energy IDs for faster procedures. Leneda marks a key step towards a more sustainable, competitive energy system. It may also include water and heat data in the future.

The country also continued to strengthen its strategy linking the digital and green transitions, in line with the '*Ons Wirtschaft vu muer'* roadmap and the National Energy and Climate Plan (PNEC). Efforts focus on optimising the energy efficiency and greening the supply of digital infrastructures, such as datacentres, through measures like promoting renewable energy adoption, waste heat recovery, immersion cooling, and material efficiency. The MeluXina supercomputer, ranked among the most energy-efficient globally, highlights this ambition. In addition, Sector-specific initiatives, such as funding for smart agriculture solutions and AI-based smart grid projects, further support the deployment of digital solutions that reduce carbon footprints across the energy, transport, and agriculture sectors.

According to the Digital Decade Eurobarometer 2025, 77% of Luxembourgish people consider digital technologies important to help fight climate change, while 81% of Luxembourgish respondents think that ensuring that digital technologies serve the green transition should be an important action for public authorities.

2024 recommendation on green ICT: (i) Develop a coherent approach to twinning the digital and green transitions. First, promote improvements in energy and material efficiency of digital infrastructures, in particular datacentres. Second, support the development and deployment of digital solutions that reduce the carbon footprint in other sectors, such as energy, transport, buildings, and agriculture, including the uptake of such solutions by SMEs.

(ii) Monitor and quantify the emission reductions of the deployed digital solutions in line with the relevant EU guidance and with the support of the methodology developed by the European Green Digital Coalition, in view of future policy development, as well as of attracting relevant financing.

(i) Luxembourg addressed fully the recommendation by putting significant policy actions into place in 2024. Luxembourg added five new measures and continued to strengthen its strategy to twin the green and digital transitions through sector-specific initiatives, enhanced SME support, and the promotion of energy-efficient digital infrastructures such as datacentres and the national supercomputer MeluXina.

(ii) No information is available on measures taken to address the recommendation.

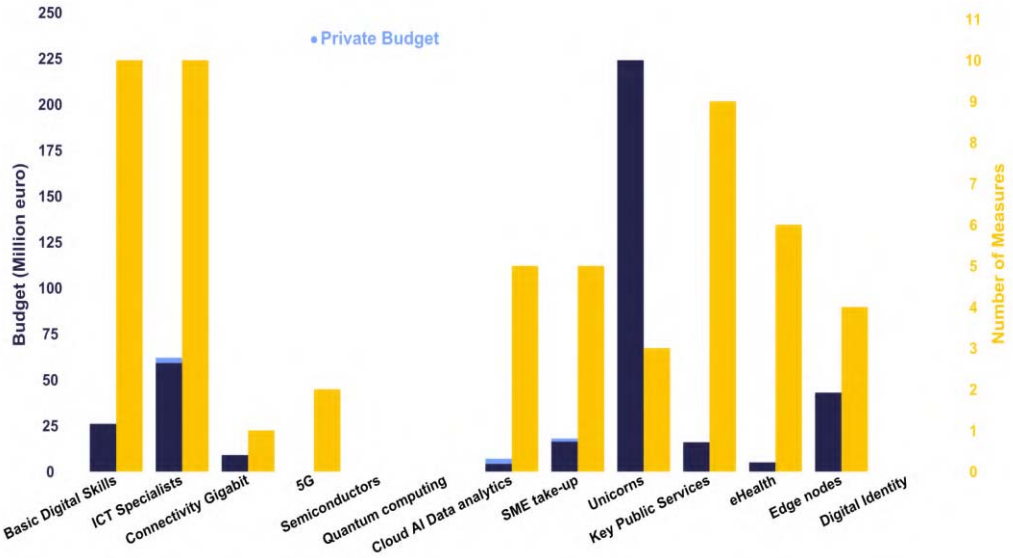
Annex I – National roadmap analysis

Luxembourg's national Digital Decade strategic roadmap

Luxembourg submitted a fully revised national Digital Decade roadmap on 2 December 2024, containing more than 30 new and edited measures and revised trajectories. The roadmap notably strengthens the focus on SMEs and AI, with new support tools set to be launched in 2025. It addresses a substantial number of roadmap recommendations issued in 2024:

- *(i) Examine the opportunity of providing a target and trajectory for unicorns, (ii) provide a target and trajectory for edge nodes*: Luxembourg has not set a national target or trajectory for unicorns or edge nodes. For unicorns, Luxembourg highlights the small market size and its role as a testbed for innovative companies as reasons why setting a target is not feasible. For edge nodes, Luxembourg considers that due to its near-complete high-speed internet coverage and small territory, the need for edge nodes is limited, and contributions will mainly occur through participation in EU initiatives like the IPCEI on Next-Generation Cloud Infrastructure and Services. In addition, in its revised roadmap, Luxembourg did not provide a national target for Edge Nodes but continues to monitor the work on the definition of a methodology for the KPI assessment.
- *Review and reinforce, if deemed necessary at this stage, measures to contribute to the targets that are the most challenging to reach, such as the digital skills for all, the basic level of digital intensity for SMEs:* six new measures were added for digital skills and two important ones for SMEs.
- *Provide more information on the implementation of digital rights and principles, including what national measures contribute to it:* Luxembourg addressed this recommendation in the roadmap adjustment by mapping national policies and measures to the digital rights and principles, ensuring alignment with the Digital Decade objectives.

Measures and budget in national roadmap[8]



[8] When referring to national roadmaps, data used in this report are those declared by the Member States in their national roadmaps, on the basis of the Commission's guidance (C(2023) 4025 final). Data might reflect possible variations in reporting practices and methodological choices across Member States. No systematic assessment of the extent to which Member States followed the guidance was carried out.

Luxembourg

The revised roadmap continues to prioritise connectivity, cybersecurity, SME digitalisation, and in general the adoption of advanced technologies such as AI and cloud. A total of 98 measures are now part of Luxembourg's national strategic roadmap with a budget of EUR 515 million, EUR 488 million comes from public budgets, equivalent to 0.57% of Luxembourg's GDP in 2024. It covers all objectives of the Digital Decade, including human-centred digital transformation, resilience and security, technological sovereignty, the twin green and digital transition, and digital rights and principles.

Annex II – Factsheet on multi-country projects (MCPs) and funding

Multi-country projects and best practices

Luxembourg is a member of the three established EDICs; the Alliance for Language Technologies EDIC, the Local Digital Twins towards the CitiVERSE EDIC and of the EUROPEUM EDIC. It has also offered to host an EDIC that is being set up in the area of genomics. Luxembourgish entities are indirect partners in the IPCEI on Next Generation Cloud Infrastructure and Services (IPCEI-CIS). Luxembourg is also a participating state of the EuroHPC Joint Undertaking (JU) and of the Chips JU.

The country has contributed to the Best Practice Accelerator[9] by sharing three best practices. Two of them are part of the Digital Skills cluster: Girls in ICT Day national awareness action and Girls Deploy your Digital Talent. Another best practice - the creation and promotion of a Product Circularity Data Sheet (PCDS) - has been shared under the Green IT Cluster.

EU funding for digital policies in Luxembourg

Luxembourg allocates 38% of its total recovery and resilience plan to digital (EUR 24 million)[10]. In addition, under cohesion policy, EUR 6 million (representing 15% of the country's total cohesion policy funding), is dedicated to advancing Luxembourg's digital transformation[11]. According to JRC estimates, EUR 28 million directly contribute to achieving Digital Decade targets (of which EUR 24 million comes from the RRF and EUR 4 million from cohesion policy funding)[12].Luxembourg's RRF and Cohesion Fund investments for digital policies are modest in volume but strategically focused. The largest share supports digital public services, including improvements to electronic health records and digital portals for citizens and businesses. Funding also targets emerging technologies such as cloud computing, AI, and data analytics, reflecting national efforts to build digital capabilities within the public sector. Resources are allocated to support digital late adopters and scale-ups, in line with Luxembourg's roadmap priorities on inclusion and innovation. However, key areas such as 5G, gigabit connectivity, and e-ID remain without dedicated EU funding.

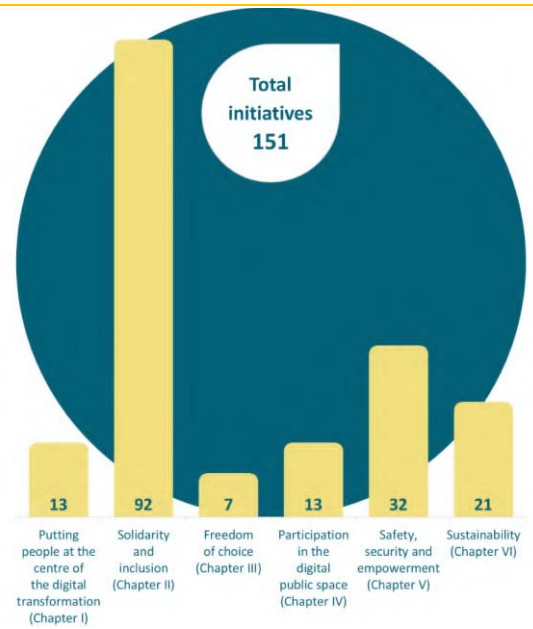
[9] The Best Practice Accelerator (BPA) is a platform that enables Member States to share successful measures and challenges encountered in their efforts to meet their Digital Decade targets and objectives. Best practices are made available to Member States via the BPA Repository and showcased in regular workshops, currently focused on three thematic clusters: Digital Skills, Green IT, and the Uptake of Digital Technologies.

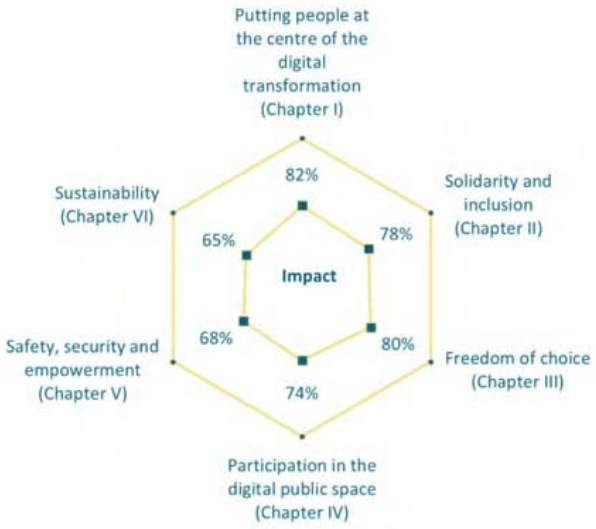
[10] The share of financial allocations that contribute to digital objectives has been calculated using Annex VII to the Recovery and Resilience Facility Regulation. Last data update: 16 May 2025.

[11] This amount includes all investment specifically aimed at or substantially contributing to digital transformation in the 2021-2027 Cohesion policy programming period. The source funds are the European Regional Development Fund, the Cohesion Fund, the European Social Fund Plus, and the Just Transition Fund.

[12] Joint Research Centre, Nepelski, D. and Torrecillas, J. Mapping EU level funding instruments 2021-2027 to Digital Decade targets – 2025 update, Publications Office of the European Union, Luxembourg, 2025, JRC141966. Last data update: 10 March 2025.

Annex III – Digital Rights and Principles[13]





Activity on Digital Rights and Principles (figure 1)

Luxembourg has been one of the most active Member States in implementing digital rights and principles, with over 100 initiatives overall and 20 new initiatives launched in 2024, showing significant progress towards its commitments. **Luxembourg is most active in the area of Digital education, training and skills** (II). There is room for improvement, especially with regards to A fair digital environment (III) where less activity has been identified.

Impact of Digital Rights Initiatives (figure 2)

Quantitative impact indicators developed by the support study illustrate the level of implementation of digital rights initiatives on the ground. Based on available data, they estimate the impact of measures implemented by key stakeholders in Luxembourg (mainly national government) and how these are perceived by citizens.

The indicators suggest that **Luxembourg is most successful in implementing commitments related to Putting people at the centre of the digital transformation** (I). Luxembourg should review and strengthen efforts in areas where the impact of digital rights initiatives appears to be limited despite relative activity, notably on Sustainability (VI).

According to the Special Eurobarometer 'Digital Decade 2025', **58% of citizens in Luxembourg think that the EU protects their digital rights well** (a 2% increase since 2024). This is above the EU average of 44%. Citizens are particularly confident about getting access to a trustworthy, diverse and multilingual digital environment (77%, above the EU average of 53%). They are most worried that their

[13] Based on a study to support the Monitoring of the Implementation of the Declaration on Digital Rights and Principles, available here. For a more detailed country factsheet accompanying the study, click here.

right to a safe digital environment and content for children and young people is not well protected (34%, below the EU average of 48%).