



LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG

Digital Decade

ADDENDUM FOR ADJUSTMENTS TO THE NATIONAL
STRATEGIC ROADMAP FOR LUXEMBOURG

NOVEMBER 2024



Section I: Overview of the roadmap adjustment

This introductory section can be used by Member States to provide a brief, high level overview of the updated policy context and of the key elements adjusted to their roadmaps (such as new targets, new measures, etc). It should outline the rationale behind the adjustments, which may stem from the State of the Digital Decade report 2024 recommendations (see section III) or may be due to reasons beyond these.

An introductory preface and contextual framework have been incorporated into the Luxembourg roadmap to enhance the readers' comprehension of the document.

Section 1 - Analysis of the state of play of digital transformation in Luxembourg - has been revised to reflect the most recent Key Performance Indicator (KPI) values.

The trajectories of Section 2 - National trajectories and target values to contribute to the EU's digital targets - have been revised to incorporate the latest Key Performance Indicator (KPI) values. The trajectory on Edge Nodes has been removed as it was not aligned with the newly received detailed explanations of the KPI. Additionally, textual modifications have been made in the description of the trajectories to reflect recent developments in 2024.

The layout of all measures in Section 3 - Policies, measures, and actions to achieve the digital targets – and Section 4 - Main policies, measures, and actions to contribute to the general objectives has been revised to align with the Commission guidance document “Guidance to the Member States on the preparation of the national Digital Decade strategic roadmaps”. This revision has led to the modification of existing measures to address previously missing information and reflect developments occurring in 2024. Furthermore, new measures corresponding to the digital targets, general objectives, or Commission recommendations have been introduced, with the new measures in Section 3 distinctly marked as such. Additionally, the general objectives in Section 4 have been linked to the European declaration on digital rights and principles. Finally, a handful of measures have been removed from the roadmap due to their misalignment with the Commission guidance document or their obsolescence.

Similarly, the layout of all the multi-country projects in Section 5 - EU level cooperation – has been revised and updated to incorporate previously missing information, ensuring alignment with the Commission guidance document “Guidance to the Member States on the preparation of the national Digital Decade strategic roadmaps”. Developments of multi-country projects occurring in 2024 have furthermore been incorporated in the description part.

Section 6 - Stakeholder consultations – has been revised to incorporate the stakeholder consultation conducted in 2024. Additional information can be found in the Section II – Stakeholder feedback.

Only minor textual changes have been made to Section 7 - Overall impact and conclusions.



Section II: Stakeholder feedback

This section should describe the overall activities, detailing the consultation strategy and mechanisms undertaken to involve private and public stakeholders in the preparation of the adjustment to the national roadmap, including:

- *a detailed description of who was consulted,*
- *a summary of the comments made,*
- *how the feedback has been taken into account.*

From June to July 2024, a public stakeholder consultation was held to gather inputs on the 2023 Digital Decade National Strategic Roadmap for Luxembourg from stakeholders across the national digital ecosystem, including private companies, SMEs, public institutions, social partners, civil society, and research. In accordance with Article 9 of the Digital Decade Policy Programme, the consultation aimed to engage the national digital ecosystem on Luxembourg's 2023 Digital Decade National Strategic Roadmap.

The consultation was open from June to July 2024 on the “Zesumme Vereinfachen” platform, where participants could access and complete the online questionnaire. The inputs received were shared with the Interministerial Committee on Digital Policies in the context of the 2024 update of the national roadmap.

The consultation challenged the participants on the targets and general objectives of the Digital Decade Policy Programme as well as the measures proposed within the national roadmap. The survey indicates a diverse mix of participants, with the majority being from commercial companies. The consultation confirmed the strengths and weaknesses of Luxembourg's digital ecosystem that have already been considered in the Commission recommendations. A high number of participants pointed to the challenge to realise their twin transition in conjunction with their digital transition while being under high economic, administrative, and regulatory pressure.

In addition to the public consultation, regular consultations of the digital ecosystem are organised by the different governmental departments. Those consultations involve a wide range of digital stakeholders, including for example research and educational institutions, regulators, social partners, chambers and industry representatives, telecom and satellite operators, healthcare professionals, or private tech companies. This broad consultation ensures that Luxembourg's digital policies are well-rounded and consider the perspectives of all key stakeholders, including representatives from civil society and the broader digital ecosystem.



Section III: Adjustments to the national strategic roadmap to address the specific recommendations for Luxembourg

Member States are invited to describe, for each recommendation, how the roadmap has been adjusted, using the table below. When one or more recommendations are not addressed by the current adjustments to the roadmaps, the Member State is invited to indicate what these recommendations are and to provide the reasons for not proposing adjustments.

National digital decade strategic roadmap

Luxembourg specific SDD 2024 recommendation - Target and trajectory for unicorns	<i>Examine the opportunity of providing a target and trajectory for unicorns.</i>
Overview of main policies, measures and actions taken/planned	<p>There is no specific target that Luxembourg will set when it comes to the number of Unicorns.</p> <p>The small size of the country as well as its natural propensity to be a "test bed" for innovative companies that will subsequently grow operations in other larger EU countries points to potentially few Unicorns in number and renders very complex carrying out such a forecasting exercise.</p> <p>Luxembourg published in June 2023 a startup and scaleup roadmap called "From Seed to Scale" which aims at enhancing Luxembourg ecosystem to provide a better environment for start-ups and scale-ups to thrive and contribute to the Digital Decade goals to increase the number of European Unicorns.</p>

Luxembourg specific SDD 2024 recommendation - Target and trajectory for edge nodes	<i>Examine the opportunity of providing a target and trajectory for edge nodes.</i>
Overview of main policies, measures and actions taken/planned	<p>For this digital target, no quantitative target is set. However, Luxembourg will contribute to achieving the EU target.</p> <p>Since the Luxembourg territory is small, and high-speed Internet coverage of Luxembourg is close to 100%, all cloud-like IT services in Luxembourg can be reached within a few milliseconds substantially reducing the need of edge-nodes.</p> <p>In the context of the IPCEI on Next-Generation Cloud Infrastructure and Services, Luxembourg is currently developing edge-nodes for a cybersecurity data space.</p>

Luxembourg specific SDD 2024 recommendation - Addressing key challenges	<i>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.</i>
Overview of main policies, measures and actions taken/planned	<p>To accelerate Luxembourg's progress across all digital targets, particularly those that are most challenging to achieve, it is essential to continuously monitor and, where necessary, reinforce existing measures.</p>



	<p>Luxembourg’s measures are regularly assessed, and its progress toward the Digital Decade targets is closely monitored. As part of the roadmap adjustment process, both existing measures were reviewed and new measures introduced, with clear indications of the additions. More information can be found in the specific recommendations hereafter.</p>
--	--

<p>Luxembourg specific SDD 2024 recommendation - Implementing and contributing to digital rights and principles</p>	<p><i>Provide more information on the implementation of digital rights and principles, including what national measures contribute to it.</i></p>
<p>Overview of main policies, measures and actions taken/planned</p>	<p>In the adjustment exercise, the digital rights and principles have been duly considered. The section dedicated to the main policies, measures, and actions contributing to the general objectives of digital citizenship, fostering leadership and sovereignty, and supporting the green transition includes a mapping of these initiatives to the digital rights and principles, ensuring alignment with the overarching goals.</p>

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

<p>Luxembourg specific SDD 2024 recommendation - Connectivity infrastructure</p>	<p><i>Ensure sufficient access of new players to spectrum for innovative business-to-business (B2B) and business-to-customer (B2C) applications and encourage operators to speed up the deployment of 5G stand-alone core networks.</i></p>
<p>Overview of main policies, measures and actions taken/planned</p>	<p>Sufficient access of new players to spectrum for innovative business-to-business (B2B) and business-to-customer (B2C) applications will be ensured through a new spectrum policy framework. A public consultation on 26Ghz has shown no interest at the moment, another consultation is planned to be launched in 2025. The deployment of 5G stand-alone core networks is dependent on the development of necessary equipment.</p>

<p>Luxembourg specific SDD 2024 recommendation - 5G Cybersecurity Toolbox</p>	<p><i>Continue the implementation of the 5G Cybersecurity Toolbox to ensure secure and resilient 5G networks.</i></p>
<p>Overview of main policies, measures and actions taken/planned</p>	<p>Luxembourg is continuously working on the implementation of the 5G Toolbox Measures. While some of the measures are rather difficult to implement due to the size of the market, the players on the market and the networks, Luxembourg has advanced on the implementation of the measures foreseen in our legislation. Luxembourg has established a solid inventory of devices, firmwares and softwares used in its critical networks and is making sure that the inventory is kept up to date. A dedicated expert group has also been established to support the</p>



	government with the analysis of the inventory and is advising the government in the case specific measures have to be imposed on the ISPs. The expert group is also in regular contact with the security experts of the Luxembourgish ISPs.
--	---

Luxembourg specific SDD 2024 recommendation - Digitalisation of enterprises	<i>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.</i>
Overview of main policies, measures and actions taken/planned	<p>Luxembourg continues to support the digitalisation of SMEs by offering existing programs like Fit 4 Digital, Fit 4 Innovation, and the SME Package – Digital, while also introducing new initiatives, such as Fit 4 Digital – AI and an AI-focused SME package - Digital, expected to launch by late 2024 or early 2025.</p> <p>Fit 4 Digital is a program offering businesses guidance, digital maturity assessments, and potential co-funding for implementing digital improvements in IT, cybersecurity, and software.</p> <p>Fit 4 Innovation helps SMEs to optimize operations and reallocate resources to innovation by using external experts to eliminate inefficiencies, with financial support for consultancy costs.</p> <p>In 2024, the Luxembourg Government announced a reform of the “Fit 4” performance programs to further facilitate access for businesses.</p> <p>The SME Packages - Digital program offers businesses support to improve online customer communication and business management through digital marketing, management systems, and electronic invoicing, with guidance from professionals and advisors.</p> <p>Luxembourg also aims at building the first Open Cybersecurity dataspace and a set of open-source cybersecurity services. The goal is to create a less discriminatory market in terms of costs and give SMEs an access to data and services at an accessible price.</p>

Luxembourg specific SDD 2024 recommendation - Uptake of AI, Data Analytics & Cloud	<ul style="list-style-type: none"> • <i>Consider further awareness-raising measures and/or training directed at SMEs to adopt AI and data analytics as means to boost competitiveness.</i> • <i>Support the broad uptake of the next generation of cloud infrastructure and services under development in the IPCEI-CIS by companies of all sizes, including by liaising with the direct participants to develop a country-specific dissemination strategy reaching beyond the participating organisations.</i>
Overview of main policies, measures and actions taken/planned	<ul style="list-style-type: none"> • Luxembourg will introduce new initiatives dedicated to AI, such as Fit 4 Digital – AI and an AI-focused SME package – Digital as well as a cybersecurity-focused one, expected to launch by late 2024 or early 2025. <p>Fit 4 Digital – AI will help businesses work with expert consultants to identify AI challenges, define objectives, assess use cases, and create a detailed action plan with cost estimates and ROI projections for AI solutions.</p>



	<ul style="list-style-type: none">• Luxembourg contributes to this IPCEI with a special focus on open-source cybersecurity tools like SOC (Security Operations Centre) and CSIRT (Cyber Security Incident Response Teams) tools for Cloud and edge cloud generating important positive externalities in terms of synergies. Luxembourg will also provide privacy and trade secrets preserving technologies for cloud that are capable of running on edge nodes. Luxembourg has put a special focus on cross-company and cross-border collaboration and the capitalisation of synergies.
--	---

Protecting and empowering EU people and society

Luxembourg specific SDD 2024 recommendation - Basic digital skills	<i>Strengthen the strategy to develop the population's basic digital skills.</i>
Overview of main policies, measures and actions taken/planned	<p>Luxembourg remains committed to strengthening the digital competencies of its population through a comprehensive and inclusive approach, ensuring that no demographic is left behind. This includes the continuation and expansion of existing initiatives aimed at children, students, the workforce, and senior citizens, with a focus on enhancing digital literacy across all age groups.</p> <p>For children and students, digital skills initiatives are continued within both formal and non-formal education settings, with new measures introduced to raise awareness about privacy and responsible digital consumption. Efforts to support the older generation are sustained through ongoing training programs and workshops, providing opportunities for digital upskilling and engagement.</p> <p>The workforce also benefits from strengthened measures, particularly through the "Skillsbridges" programmes, that are short-term courses designed to help adults adapt to new technologies and the constantly evolving job market, focusing on both upskilling and reskilling. ADEM, along with its partners, will furthermore continue to offer specific training courses for jobseekers to improve their employability. Programmes such as Basic Digital Skills and Digital Fundamentals will help to develop the population's digital skills. Along with these specific training programmes goes the implementation of OECD Skills Strategy for Luxembourg which aims to implement skills policies that consider more the real needs of the labour market. It must be said that the so-called Skills Gap remains a huge problem when it comes to bringing together job seekers and companies that are looking for new highly qualified employees.</p>



<p>Luxembourg specific SDD 2024 recommendation - E-Health</p>	<ul style="list-style-type: none"> • <i>Make the data types of e-prescription and e-dispensation available to people through the online access service.</i> • <i>Ensure that all data types are made available in a timely manner.</i> • <i>Enhance the authentication method for logging into the online access service by using a notified e-ID.</i> • <i>Increase the supply of health data by onboarding more categories of healthcare providers.</i>
<p>Overview of main policies, measures and actions taken/planned</p>	<ul style="list-style-type: none"> • The ePrescription/eDispensation roll-out is one of the services foreseen within the EHDS regulation implementation, as well as in the framework of Agence eSanté’s participation in the EU4Health programme (call EU4H-2022-DGA-MS-IBA-3) for the expansion of the MyHealth@EU services. • Ensure that all data types are made available in a timely manner, this is indeed foreseen as part of a new digital health strategy (still under development) that will be based on specific measures related to the EHDS Regulation. The availability of data that will be made available in a timely manner will be those that are qualified in the EHDS regulation as “priority categories”. This includes data of the patient summary, electronic prescriptions; electronic dispensations; medical imaging studies and related imaging reports; medical test results, including laboratory and other diagnostic results and related reports; discharge reports. At present no further specific information can be given as we are still awaiting the final adoption of the EHDS regulation. • Enhance the authentication method for logging into the online access service by using a notified e-ID is also foreseen as part of a new digital health strategy, and compliance with the EHDS related measures will have to be observed. A project is underway and aims at allowing patients to access the services via a central governmental portal that is e-ID supported. • Increase the supply of health data by onboarding more categories of healthcare providers is one of the prime objectives of the new digital health strategy currently under development. No further details can be given at this stage. Until the implementation of the new strategy, regular meetings with HCPs and editors are organised to enhance their uptake in the current circumstances.

Leveraging digital transformation for a smart greening

<p>Luxembourg specific SDD 2024 recommendation - A coherent approach to twinning the digital and green transitions</p>	<p><i>Promote improvements in energy and material efficiency of digital infrastructures, in particular data centres. Furthermore, 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.</i></p>
---	---



<p>Overview of main policies, measures and actions taken/planned</p>	<p>Luxembourg is aware of the challenges posed by the development of the digital economy and its impact on energy consumption. As has been highlighted already in the strategy paper “Ons Wirtschaft vu muer”, a roadmap for a competitive and resilient economy to 2025, Luxembourg is pushing to support projects that aim to optimize the energy consumption of datacenters or other digital infrastructures (use of waste heat, immersion cooling, material efficiency etc.) to reflect environmental ambitions for reduced energy consumption.</p> <p>The introduction of the MeluXina supercomputer in 2021 as part of the EuroHPC network underscores these efforts, as the MeluXina supercomputer was one of the most energy-efficient supercomputers in the world at the time of its implementation (Green500).</p> <p>In line with the “Ons Wirtschaft vu muer” roadmap, Luxembourg is actively encouraging data centers and other digital infrastructures to transition to renewable energy sources by promoting targeted aid schemes under the State aid regime for environmental protection (European Regulation General Block Exemption Regulation – GBER) that support the adoption of clean energy, thereby reducing reliance on fossil fuels. Luxembourg also provides targeted subsidies (SME Packages – Digital, Fit 4 Digital), offering both financial and technical support, to assist SMEs in implementing energy-efficient and sustainable digital solutions, as outlined in the national strategic roadmap for Luxembourg in the chapter on digital transformation of businesses. The level of aid for a digital solution is further tied to its environmental impact.</p> <p>The recommendation on leveraging digital transformation for a smart greening is also supported by the Luxembourg’s National Energy and Climate Plan (“PNEC”), which seeks to drive digitalisation across various sectors to achieve the climate and energy objectives for 2030.</p> <p>Sector specific examples that support the development and deployment of digital solutions that reduce the carbon footprint in other sectors are for example:</p> <ul style="list-style-type: none">> The Ministry of Agriculture, Food, and Viticulture’s innovation and research funding. It supports, amongst others, the development and adoption of digital solutions in agriculture, aiming to promote smarter, more resource-efficient farming.> The AI Factory initiatives, where Luxembourg targets to encourage the implementation of smart energy systems by utilizing AI and IoT for smart grid management, enhancing energy distribution efficiency and reducing wastage.
---	--



Luxembourg specific SDD 2024 recommendation - Monitoring and quantification of emission reductions of digital solutions	<i>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>
Overview of main policies, measures and actions taken/planned	At present, no direct mechanisms for the monitoring and quantification of emission reductions associated with deployed digital solutions have been identified. Nevertheless, Luxembourg acknowledges the critical importance of this recommendation and remains committed to addressing it. The country's ongoing efforts to reduce emissions are outlined in the aforementioned recommendation.