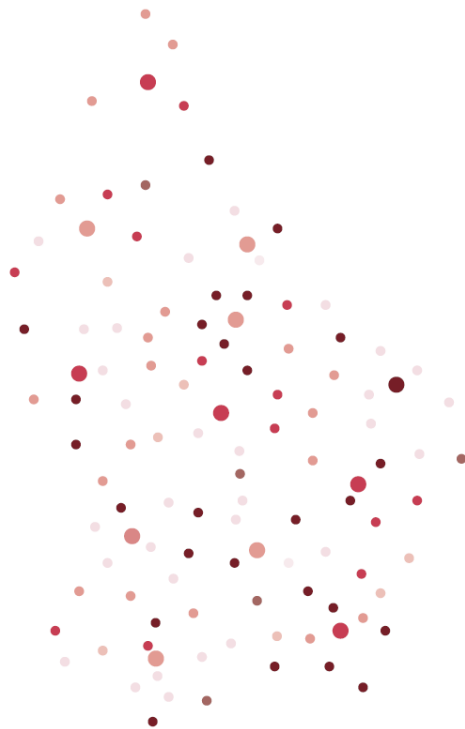




LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG

National Plan for a Green, Digital and Inclusive Transition



*National Reform Programme
of the Grand Duchy of Luxembourg
in the framework of the European Semester 2023*

English courtesy translation of the original document (in French)



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List of acronyms

ADEM	National Employment Agency	LHC	Luxembourg House of Cybersecurity
AI	Artificial Intelligence	LIH	Luxembourg Institute of Health
AMIF	Asylum, Migration and Integration Fund	LISER	Luxembourg Institute of Socio-Economic Research
ASP	Socio-Educational Support	LIST	Luxembourg Institute of Science and Technology
ATAD	Anti-Tax Avoidance Directive	LMDDC	Luxembourg Media and Digital Design Centre
AVC	Cost-of-living allowance	LTIO	Luxembourg Trade and Investment Office
BEPS	Base erosion and profit shifting	LULUCF	Land use, land-use change, and forestry
BI	International baccalaureate	MIP	Macroeconomic Imbalance Procedure
BMVI	Border Management and Visa Instrument	MVA	Megavolt-amperes
BTS	<i>Brevet de technicien supérieur</i>	MW	Megawatt
CAI	Welcome And Integration Contract	NACE	Statistical classification of economic activities in the European Community
CCAM	Connected, Cooperative and Automated Mobility	NCAP	New Car Assessment Program
CCIOF	Interoperability Competence Centre	NCER	National Centres of Excellence in Research
CEF	Connecting Europe Facility	NEET	Not in education, employment or training
CEFIS	Centre for Intercultural and Social Studies and Training	NIF	National Interoperability Framework
CES	Economic and Social Council	NREAP	National Renewable Energy Action Plan
CFL	<i>Société Nationale des Chemins de Fer Luxembourgeois</i>	NRP	National Reform Programme
CGFP	General Confederation of the Civil Service	NVAO	<i>Nederlands-Vlaamse Accreditatieorganisatie</i> (Dutch-Flemish Accreditation Organisation)
CIF	Leave for individual training	NZEB	Nearly Zero Energy Building
CIRCL	Computer Incident Response Centre Luxembourg	ODC	Competitiveness Observatory
CISP	Socio-professional Integration Centres	OECD	Organisation for Economic Cooperation and Development
CNI	National Interoperability Committee	OP	Operational programme
CNS	National Health Fund	PAN	National Action Plan
COREPER	Permanent Representatives Committee	PDAT	Master Programme for Spatial Planning
CRII	Coronavirus Response Investment Initiative	PDF	Portable Document Format
CSA	Child care service voucher	PISA	Programme for International Student Assessment
CSI	Sector Committee for Interoperability	PMO	Project Management Office
CTIE	Government IT Centre	PNDD	National Sustainable Development Plan
CULGE	General Culture branch	PNEC	National Energy and Climate Plan
DAC	Directive on Administrative Cooperation	PNED	National data exchange platform
DAP	<i>Diplôme d'aptitude professionnelle</i>	PNM	National Mobility Plan
DB	<i>Deutsche Bahn</i> (German National Railway Company)	PPA	Power purchase agreements
DLT	Distributed Ledger Technology	PPP	Public-Private Partnerships
EAFRD	European Agricultural Fund for Rural Development	PRIMES	Price-Induced Market Equilibrium System
EaSI	Employment and Social Innovation	PSBC	Public sector blockchain
EBP	European Blockchain Partnership	PSLF	Public Sector Loan Facility
EBSI	European Blockchain Service Infrastructure	PST	Sector-based Transport Plan
EC	European Commission	PTTJ	Territorial Just Transition Plan
ECS	European Company Survey	PV	Photovoltaic
E-DIH	European Digital Innovation Hub	R&D	Research and Development
EEA	European Energy Award	R&I	Research and Innovation
EED	Energy Efficiency Directive	RDI	Research, Development and Innovation
EEI	Energy Efficiency Index	REACT-	Recovery Assistance for Cohesion and the Territories of Europe
EEOS	Energy Efficiency Obligation Scheme	EU	
		REFM	Renewable energy financing mechanism



EIG	Economic Interest Grouping	REVIS	Social inclusion income
ESF +	European Social Fund Plus	RGD	Grand-Ducal Regulation
EU	European Union	RGTR	General road transport regime
Ex-VAT	Excluding Value Added Tax	RMC	Raw material consumption
FEAD	Fund for European Aid to the Most Deprived	RPGH	Income for the severely disabled
FEDER	European Regional Development Fund	RRF	Recovery and Resilience Facility
FEDIL	Federation of Luxembourg Industrial Entities	RRP	Recovery and Resilience Plan
FNR	National Research Fund	SDG	Sustainable Development Goals
GDP	Gross Domestic Product	SEQUE-UE	EU Emissions Trading System
GPEC	Employment and Skills Planning	SIA	School Integration and Reception Service
GSP	Growth and Stability Programme	SIEG	Services of General Interest
GTL	GovTech Lab	SMC	Department of Media, Connectivity and Digital Policy
GWh	Gigawatt-hour	SME	Small and Medium-Sized Enterprises
HPC	High Performance Computing	SMET	Single Market Enforcement Taskforce
HPDA	High Performance Data Analytics	SMOR	Working Party on Structural Measures and Outermost Regions
HTLS	High Temperature Low Sag	SNCB	Belgian National Railway Company
IGSS	General Inspectorate of Social Security	SNCF	French National Railway Company
INTERREG	European Territorial Co-operation	SnT	Interdisciplinary Centre for Security, Reliability and Trust
IOP	Interoperability	SO	Specific Objective
IPCC	Intergovernmental Panel on Climate Change	SSM	Social Minimum Wage
ISF	Internal Security Fund	STATEC	National Institute of Statistics and Economic Studies
ISO	International Organization for Standardization	SUP	<i>Strategische Umweltprüfung</i> (Strategic Environmental Impact Assessment)
IT	Information technology	SYVICOL	Union of Luxembourg Cities and Communes
ITC	Information and communication technologies	TFUE	Treaty on the functioning of the European Union
ITI	Integrated Territorial Investment	TICE	Inter-municipal passenger transport in the canton of Esch-sur-Alzette
JTF	Just Transition Fund	TJ	Terajoule
kgeo	Kilogrammes of oil equivalent	UEL	<i>Union des entreprises luxembourgeoises</i>
kWp	Kilowatt-peak	VAE	Validation of Prior Experience
LCGB	Luxembourg Confederation of Christian Trade Unions	VAT	Value Added Tax
L-DIH	Luxembourg Digital Innovation Hub	ZAE	Business Activities Zone
LDSB	Luxembourg Digital Skills Bridge		



1. Introduction

Old certainties are challenged in times of crisis. Not long ago, peace in Europe seemed assured, the benefits of globalisation prevailed in public perception and the growth of prosperity was taken for granted by most of us. For some years now, the crises have followed one another, overlapping and in some cases reinforcing each other. The growing climate and environmental crisis, the global pandemic of COVID-19, Russia's war of aggression against Ukraine and increased geopolitical tensions around the world show that stability, security and cooperation in the broadest sense are becoming increasingly uncertain, also in Europe.

The current crises come on top of existing structural problems in Europe, including unfavourable demographic trends, limited natural resources, low production capacity in a range of key and strategic industries, persistent labour shortages and relatively high public debt. Although these problems affect Member States with different intensities, the EU is particularly exposed to the shocks and repercussions. In addition, the recurrent emergence of new crises risks pushing other problems into the background, especially those that are longer term and whose effects are more intangible and seem distant, such as the climate change crisis, which has significant disruptive potential. Therefore, it is important to address the challenges of global warming appropriately and to continue climate policy action despite other crises that arise in parallel and to which priority must be given at times.

From the outset, the pandemic has severely hampered social and economic life and caused considerable damage, especially in 2020 and to a lesser extent in the years following. Although the pandemic situation has subsided for some time and is no longer the focus of attention in Europe, it has continued to have an impact on the economy, particularly through the ongoing disruption of global supply chains. In conjunction with increased demand as a result of the so-called 'post-COVID' recovery, this has led to increasing inflationary pressures from the second half of 2021. The war in Ukraine and economic sanctions against Russia then amplified the difficulties by further limiting the availability of inputs to production, particularly energy, causing additional price increases across virtually all material categories and cascading downstream through value chains, pushing inflation to levels not seen for decades in Europe and Luxembourg.

The recent crises have caused social and economic upheavals of varying depths. They have changed some of our habits and the way we live, govern and work. For example, the pandemic has given a boost to the digital transition, notably through the spread of remote working. It has also increased awareness of health issues and accelerated medical research, among other things. By revealing vulnerabilities, the crisis has also brought the notion of resilience in all its dimensions to the forefront. In this sense, the pandemic has given us valuable experience to be better prepared for the future. The war in Ukraine has brought geopolitical, and especially defence and security, considerations to the fore. In addition, the fact that energy was used as a coercive tool from the outset of the war has advanced the energy transition in the European Union by leading to a major collective effort to save energy and accelerate the deployment of renewable energy.

In response to the crises, the European Union has put in place new instruments and policies to lay the foundations for future development. The European Green Deal, the Recovery and Resilience Facility and the REPowerEU initiative are among the most important measures to make the EU more resilient to shocks and to reorient the economy towards sustainable competitiveness.

At the national level, Luxembourg has been responsive to the COVID-19 pandemic. In order to minimise the damage and limit the impact on businesses and citizens, the government has taken numerous initiatives over the past three years. The Stabilisation Programme and the '*Neistart Lëtzebuerg*' package of measures are just two of the many initiatives taken in the context of the



pandemic. With regard to the management of the pandemic, OECD Secretary-General Mathias Cormann acknowledged at the publication of the report "Evaluation of Luxembourg's response to COVID-19" that the Luxembourg public authorities' response to the crisis, led at the highest level of government, was particularly agile. Whether in the area of public health, educational continuity, the economy or the labour market, this agility in strategic action enabled Luxembourg to safeguard the continuity of the nation's life and to minimise the direct impacts of the pandemic. Luxembourg was able to rely on its mature risk management system and benefited from a very active involvement of the Parliament.¹

The inflation crisis, i.e. the surge in consumer prices caused by a general surge in producer prices, is threatening the purchasing power of households, undermining the competitiveness and profitability of many companies, putting the national economy under pressure and weighing heavily on economic forecasts. In this context, the government and the social partners have met several times in the framework of the Tripartite Coordination Committee to find solutions to help households and companies through specific measures. As a result of these meetings, three agreements were signed introducing "*Solidaritéitspak 1.0*" (31 March 2022)², "*Solidaritéitspak 2.0*" (28 September 2022)³ and "*Solidaritéitspak 3.0*" (7 March 2023)⁴, which include, among other things, selective measures to help households and businesses compensate for the rise in energy prices, as well as support measures to speed up the energy and digital transition. According to recent figures published by STATEC and Eurostat, the measures have started to bear fruit and have curbed inflation considerably, to the extent that Luxembourg posted some of the lowest annual inflation rates among euro area countries at the beginning of 2023.

The European Semester serves as a reference point for assessing and discussing the fiscal, economic, employment and social policy challenges of the EU Member States and contributes to ensuring macroeconomic stability and sustaining economic growth, which is crucial for overcoming the current crises.

As planned, the new cycle started in November with the publication of the Autumn Package by the European Commission.⁵ The new edition of the Annual Review of Sustainable Growth, the flagship document of the Autumn Package, puts the monitoring of the implementation of the Recovery and Resilience Facility (RRF) at the centre of the process. The National Reform Programme (NRP) is thus to include a six-monthly report on the progress of the national Recovery and Resilience Plan (RRP).

In addition, the new edition of the Annual Review of Sustainable Growth emphasises the continuity with the Annual Strategy for Sustainable Growth 2021 and therefore focuses on the concept of competitive sustainability and its four guiding principles, namely environmental sustainability, productivity, equity and macroeconomic stability, and the dual green and digital transition.

The European Commission's autumn package also contains the report on the 2023 Alert Mechanism. This document is the starting point of the annual cycle of the Macroeconomic Imbalance Procedure (MIP) and aims to identify potential imbalances in EU countries that require policy action. In contrast to last year, and for only the second time since the launch of the MIP, Luxembourg is among the EU Member States for which the European Commission considers it appropriate to examine emerging vulnerabilities and their implications in the context of an in-depth review.

¹ Evaluation of the responses to COVID-19 in Luxembourg: <https://gouvernement.lu/dam-assets/documents/actualites/2022/10-octobre/05-briefing-rapport-ocde/evaluation-des-reponses-au-covid-19-du-luxembourg-launchversion.pdf>

² Communiqué of 31 March 2022 : https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2022/03-mars/31-tripartite-accord.html

³ Communiqué of 28 September 2022 : https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2022/09-septembre/28-tripartite-signature.html

⁴ Communiqué of 7 March 2023 : https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2023/03-mars/07-tripartite-signature-accord.html

⁵ See: https://commission.europa.eu/publications/2023-european-semester-autumn-package_en



At the national level, several strategic documents have been developed that are fully in line with the European priorities for competitiveness and sustainability, such as the National Energy and Climate Plan (PNEC), the National Sustainable Development Plan (PNDD), the roadmap "*Ons Wirtschaft vu muer*", the Data-driven Innovation Strategy or the National Research and Innovation Strategy, to name but a few. The many efforts described in more detail in the following sections of this NRP 2023 aim to address the challenges facing the country, including those identified in the EU Council's country recommendations for Luxembourg, as well as those resulting from the strong growth the country has experienced for decades.

With regard to Luxembourg's economic development, a growth of 2.4% in gross domestic product (GDP) is expected in 2023, following a growth of 1.5% in 2022. In this context, it is worth recalling that, in international comparison, the national economy held up relatively well during the crisis years of 2020 and 2021, thanks in particular to the structure of the Luxembourg economy, which is strongly oriented towards services. The many government support measures also contributed to this good result. On the labour market, job creation was high in 2022 with a rate of 3.5%, but is likely to slow down to 2.7% in 2023. The unemployment rate fell to 4.8% in 2022 and is expected to stabilise at around 5% in 2023. In view of the current situation, it should be noted that these macroeconomic projections are subject to considerable uncertainty.

The government is pursuing an ambitious pace of public investment. In the law on the State revenue and expenditure budget for 2023⁶, direct and indirect investments amount to 4.6% of GDP, or €3.84 billion in 2023, compared with 3.7% of GDP or €2.32 billion in 2019. In the current context, which is characterised by a very high level of uncertainty, the 2023 State budget resolutely focuses on an ambitious investment policy that will improve the competitiveness of the Luxembourg economy and help to accelerate the climate and digital transition. The 2023 budget also aims to strengthen social cohesion and the purchasing power of households, while addressing the structural challenge of housing.

Coordinated government action and strengthened governance at national level will enable Luxembourg to make progress in the green, digital and inclusive transition.

⁶ Law dated 23 December 2022: <http://data.legilux.public.lu/eli/etat/leg/loi/2022/12/23/a649>



2. Macroeconomic background and scenario for 2022-2027

It is essential that NRP measures take into account the constraints of the macroeconomic environment and the medium-term budget strategy that stem from them. Implementing the NRP as a whole falls under the same economic hypotheses (macroeconomic projections) as the Stability and Growth Programme (SGP).

Needless to say, at the present time, particularly with the COVID-19 pandemic and the Russian invasion of Ukraine, the forecasts, which are snapshots, are potentially subject to rapid and significant change.

The macroeconomic forecasts used in the SGP assume real GDP growth of 2.4% in 2023 and 3.8% in 2024. For 2025, growth should reach 2.9 %. In the medium term, growth is expected to stand at 2.5% per annum between 2026 and 2027.

Table 1: Evolution of economic growth and job creation for 2022-2027

	2022	2023	2024	2025	2026	2027
Growth in GDP (as a %)	1.5	2.4	3.8	2.9	2.5	2.5
Total domestic employment (as a %)	3.5	2.7	2.5	2.2	2.4	2.2

Source: SGP (2023)

For the long term, the government has aligned its main economic assumptions with those in the macroeconomic scenario adopted for Luxembourg by the "Working Group on Ageing Populations and Sustainability" of the EU Economic Policy Committee and of its most recent report on ageing.⁷

⁷ See: https://europa.eu/epc/working-group-ageing-populations-and-sustainability_en



3. Political responses to the major economic, employment and social challenges identified

3.1. Status of the projects funded under the RRF

In its 2023 Annual Review of Sustainable Growth, the European Commission set out its strategic response to the energy crisis. In the short term, it aims to mitigate the negative effects of energy shocks. In the medium term, it aims to increase resilience and continue efforts towards sustainable and inclusive growth, while maintaining flexibility to address emerging challenges. The Recovery and Resilience Facility (RRF), which is at the heart of NextGenerationEU, is part of this strategy to invest in European businesses, infrastructure and skills until 2026, while supporting an ambitious reform agenda.

As of 30 June 2022, and in line with the legal provisions of the Regulation establishing the RRF, the European Commission has published an updated distribution key of financial allocations for all Member States. The update takes into account the economic performance of each Member State during the COVID-19 health crisis.

As the Grand Duchy has experienced a stronger economic recovery than the European average, the financial allocation for Luxembourg under the RRF is reduced from €93.4 million to €82.7 million.

In order to take account of this reduced financial contribution, the National Recovery and Resilience Plan (RRP) has been updated with specific modifications. These changes do not compromise the initial ambition that the country set for itself when drawing up the plan, nor the adherence to the legal requirements for obtaining European funds, including continued compliance with the recommendations of the European Semester for the years 2019 and 2020.

By investing 68.8% of the overall allocation in measures contributing to efforts to combat climate change, the amended RRP continues to be Europe's greenest plan. With regard to the digital transition, the modified RRP foresees investments of 29.6% of the financial allocation in the areas of digitalisation of public administration and development of new secure communication technologies.

The positive assessment of the amended plan, adopted on 17 January 2023 by the EU Council, remains unchanged in terms of its relevance, effectiveness and coherence.⁸

On 23 December 2022, Luxembourg submitted its first claim for payment under the RRF for a total of €24.9 million. This first claim represents almost half of the milestones and targets of the national RRP (26 out of 60 milestones and targets in total).

Against the backdrop of the new geopolitical realities, the European Commission presented the REPowerEU plan to reduce dependence on fossil fuels as soon as possible and to accelerate the green transition. In this context, an additional allocation of €30 million has been granted to Luxembourg. During the year 2023, Luxembourg plans to submit a dedicated chapter to REPowerEU.

⁸ See: <https://www.consilium.europa.eu/fr/press/press-releases/2023/01/17/recovery-fund-council-adopted-update-to-luxembourg-s-national-plan/>



Table 2: RRP Pillar 1 - Cohesion and social resilience

Component	Reforms and investments	Status of milestones & targets	Description
1A: Skilling, Reskilling and Upskilling	"Skillsdësch"	In progress	An initial "Skillsdësch" meeting took place on 10 July 2020 between the social partners and the government. Together, it was decided to engage the OECD to carry out a study on Luxembourg's "Skills Strategy". In order to ensure the follow-up of this study, a follow-up committee was set up between the ministries concerned.
	"FutureSkills"	Finalised	Between October 2020 and October 2021, a total of 491 jobseekers were enrolled in the "FutureSkills programme". The satisfaction rate of the participants in the programme was 96 %. More than half of the participants have already been inserted into a job or work measure within three months of completing the training.
1B: Strengthening resilience of the health system	"Gesondheetsdësch"	Finalised	With a view to drawing up the National Health Plan, the Minister of Social Security, the Minister of Health and Minister Delegate of Social Security decided to bring together the key players in the Luxembourg health system within the framework of the "Gesondheetsdësch" forum. These participants formed into six thematic groups and met in several working groups in 2020 and 2021. Several projects have been derived from the <i>Gesondheetsdësch</i> effort, some of which are currently being implemented.
	Reform of the responsibilities of health professionals	In progress	A general concept for the reorganisation of the remit of certain health professions and for the future training courses to be offered at the University of Luxembourg was drawn up and validated by the Government Council. On the basis of this concept and of exchanges with stakeholders in the field, specific concepts for the preparation of legal frameworks concerning future professional activities are being prepared for the health professions to be taught at the University of Luxembourg. The next steps are to develop a framework for future laws in collaboration with the ministries involved.
	Single digital register of health professions	In progress	The project is in its planning stage. The project is expected to be commissioned in September of 2023.
	Telemedicine solution for remote medical follow-up of patients	Finalised	As part of the crisis management linked to the COVID-19 pandemic that occurred in March 2020, the <i>eSanté</i> agency set up a telemedicine application for the remote monitoring of patients suffering from COVID-19. On the basis of the initial feedback obtained during the monitoring of patients suffering from COVID-19, it is planned to continue developing this application solution for other use cases.
1C: Increasing the supply of affordable and sustainable public housing	Housing Pact 2.0	In progress	The Housing Pact 2.0 law was passed in July 2021. The project has been very successful and by the end of 2022, a total of 99 municipalities had signed the initial agreement and a total of 45 municipalities signed an implementation agreement.
	"Neischmelz" project in Dudelange	In progress	The remediation and reclamation of the former "Neischmelz" brownfield site in Dudelange allows for the development of new neighbourhoods and living spaces in a perspective of sustainable development. The ecological component aims to revitalise the brownfields, to promote sustainable development by establishing a CO ₂ -neutral neighbourhood and to guarantee the quality of the living spaces. The energy concept is based on an initial innovative scenario using on a geothermal doublet. The implementation of this concept is subject to a series of regulatory approvals, including the Environmental Impact Assessment initiated in February 2020, the conclusions and results of which are expected by the end of 2023.



Skilling, Reskilling and Upskilling

"Skillsdësch"

The government's programme for the period 2018-2023 identified skills development as a prerequisite for implementing an effective employment policy, aimed at both maintaining employment and combating unemployment.

The government is therefore committed to developing a genuine skills strategy to promote the acquisition of new skills that meet the requirements of companies and the profiles of tomorrow's jobs. Increasing the employability of the workforce should help to ensure that employees remain in employment and that job seekers return to the labour market more quickly and long-lasting. The government's objective is to raise awareness of the concept of lifelong learning and to develop continuing and professional training in Luxembourg. To this end, all public and private players in the field of employment and vocational training are called upon to work closely together. As such, the "Skillsdësch" is a tripartite meeting platform that provides important political impulses in the field of skills development. In this context, the government, in agreement with the "Skillsdësch" partners, decided in July 2020 to set up a study on skills in Luxembourg. The "Skillsdësch" stakeholders asked to engage the OECD to carry out a skills strategy study. In order to guarantee monitoring of this study, a follow-up committee has been set up between the ministries concerned. On 27 October 2021, an initial conference between the OECD and Luxembourg stakeholders took place in Luxembourg. The Luxembourg government, in partnership with the OECD, published the Skills Study on 23 February 2023.⁹ Its objective is to close the skills gap through a long-term approach. The recommendations that the government intends to examine closely and translate into specific actions over the next few years are organised into four thematic areas:

- Priority 1: Providing labour-market-relevant adult learning opportunities
- Priority 2: Guiding and incentivising skills choices
- Priority 3: Attracting and retaining foreign talent to fill skills shortages
- Priority 4: Strengthening the governance of skills data

In this context and following the initiative led by the "Skillsdësch" the government is developing a roadmap of concrete actions. Many actions are already underway, such as:

- ADEM's new Skills4Job training programme which is currently in the pilot phase, targets jobseekers in need of upskilling or reskilling to re-enter the changing labour market to address the green and digital transition. Participants have a personal coach to support their skills assessment process, fine-tune their professional plan and set up a tailor-made training plan. Implementing upskilling and reskilling training plans is covered by the employment fund, for three months or six months respectively. These personalised training courses support green and digital transitions at the individual level.
- The new "Skills-Plang" programme of the Ministry of Labour, Employment and the Social and Solidarity Economy and ADEM is expected to facilitate intensive training of employees while they are at work (a draft bill addressing this issue will be tabled soon). The programme will target companies impacted by the green and digital transition and employees who, as a result, require internal retraining or real skills upgrading to ensure their employability and job retention. The programme will enable the establishment of upskilling/reskilling trajectories and tailor-made training plans for employees affected by these transitions. The programme will be co-financed by the Employment Fund and participating employers, with much lower rates for smaller companies.

⁹ Communiqué of 23 February 2023: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2023/02-fevrier/23-meisch-engel-oecd.html

- To create more transparency on the needs and trends of the labour market, ADEM carries out sector-based studies, in partnership with other actors of the ecosystem such as employers' organisations, which it publishes in the form of reports, videos and practical guides. These studies focus on the green and digital transitions and the impact they have on the structure of jobs and skills. They use advanced analytical methods, such as text mining, to extract data on the skills required for job vacancies.

"FutureSkills"

The "FutureSkills" programme was carried out by the National Employment Agency (ADEM), in collaboration with the social partners (Chamber of Commerce and Chamber of Employees), between October 2020 and December 2021.

The programme consisted of offering jobseekers, in the context of the health crisis, a three-month training course to strengthen cross-sector digital skills (digital trends, collaboration and office software, basics of data analysis and programming, basics of cybersecurity and data protection), soft skills (communication, collaboration, creativity, organisation and analysis) and management skills (project management, change management and risk management), followed by the option of a six-month practical training period within a public sector institution.

The following two objectives were set under the Recovery and Resilience Plan:

- 440 jobseekers (in total) who participated in the *FutureSkills* training programme
- 150 jobseekers aged over 45 who participated in the *FutureSkills* training programme

Both objectives were achieved by the end of the programme. Enrolments of jobseekers numbered 491 in the *FutureSkills* programme between October 2020 and October 2021. Of these 491 participants, 167 were aged over 45 at the time of registration.

In addition to the achievement of the two objectives, it should be noted that the satisfaction rate of the participants in the programme was 96 % (56 % of the participants stated that they were "very satisfied"). More than half of the participants have already found a job or a working and qualification measures within three months of completing the training.

Strengthening the resilience of the health system

"Gesondheetsdësch"

With a view to drawing up the National Health Plan, the Minister of Social Security, the Minister of Health and Minister Delegate of Social Security decided to bring together the key players in the Luxembourg health system within the framework of the "Gesondheetsdësch". These participants formed into six thematic groups and met in several working groups in 2020 and 2021. The aim of the meetings was to identify the challenges of the system, to analyse various possible scenarios and to recommend priority measures. Several projects were derived from the *Gesondheetsdësch*, some of which are currently being implemented.

In order to continue the *Gesondheetsdësch*, the respective work programme must be consistently implemented and it must be ensured that the various projects are part of an overall strategy with clearly defined governance and sub-project management. The projects currently underway are briefly described below:

- The National Health Plan is the main deliverable of the *Gesondheetsdësch*. It aims to formalise the health strategy for the country by giving a clear vision for the different parts of the health system. The National Health Plan is currently being developed and a presentation to the stakeholders of the *Gesondheetsdësch* was made in July of 2022.



- The project on corporate forms of the health professions aims to provide health professionals with the option of joining together in the form of a company. This new possibility should make it possible to pool some of the costs and administrative work and to improve patient access to multidisciplinary care. In 2022, the Government Council adopted a draft bill on this subject. The next steps will be defined after receiving the various opinions.
- The projects relating to the reform of the Higher Council for Certain Health Professions (*Conseil Supérieur de Certaines Professions de Santé*) and the reform of the Medical College (*Collège médical*) aim to reform two professional associations that are highly important to the Luxembourg health system. Draft texts for these two projects are in the consultation phase. The next steps will be determined after various views have been submitted.
- The projects related to the reform of the remit of health professionals and the digital register of health professions are described in the following chapters.
- The project for upgrading health professions aims to improve the image of these professions. Communication campaigns were recently launched.
- As part of the project for developing a vision of the future health ecosystem / the future of ambulatory care, the feasibility of imaging centres at non-hospital sites is being reviewed. A draft bill was adopted by the Government Council in 2022.
- The project related to communications and informing patients/insured persons is intended to improve communication processes of the social security authorities directed at protected persons as well as access to information via the different channels (telephone, mail, email, website, social networks and agency). The project is in its start-up phase.
- The project designed to implement Direct Immediate Payment solutions for insured persons is in a pilot phase.
- The "prevention analysis" project forms the analytical basis for a consolidated promotion and prevention strategy. The project will be carried out during 2023.
- Finally, the "digitalisation" project aims to set up a national eHealth/digital health strategy by a health sector taskforce under the responsibility of the Ministry of Health. The taskforce has prepared a memorandum on the national eHealth strategy which will be submitted to the Government Council shortly.

Reform of the practice and training of certain health professionals

The project relating to the reform of the remit of health professionals seeks to rework professional profiles of certain health professions with a view to setting up related bachelor programmes at the University of Luxembourg. The aim is to ensure that these health professions have a contemporary legal framework tailored to realities in the field for the exercise of their respective professions. In general, the objectives of this reform are to maintain and improve the quality and safety of care, to improve the attractiveness of health professions and to maintain cost control in the face of demographic development.

The training courses for the following health professions will be reformed as a matter of priority: nurses, specialised nurses, surgical medical technicians and midwives. In November 2022, the government tabled a bill whose aim is to offer these new courses at the University of Luxembourg.

In tandem with the introduction of the new training courses, and pending more substantial reform of the health professions and the establishment of the care system of the future, the remit of these same health professions and the profession of care assistant will be updated as a priority. Legislative work on this first step is underway and should result in a draft bill in the course of 2023.



Single digital register of health professions

The project aims to replace the current database with a new digital register for health professionals to list all health professionals licensed to practice in Luxembourg and to manage these licenses, as well as to make it available to Luxembourg and European bodies and to the general public. It will also allow better general communication with health professionals and detailed monitoring of the current and historical demography of health professionals (e.g. specialisations, age groups, geographical distribution, type of activity).

The technical part of the project is followed by the Government IT Centre (CTIE) and legal and general issues by the Ministry and the Health Directorate.

Other stakeholders involved in the project which is to be implemented in September 2023 include the Inspectorate General of Social Security (IGSS), the National Health Fund (CNS), health professionals, the Medical College, the Veterinary College, the Higher Council of Certain Health Professions (CSCPS) and the agency *eSanté*.

Telemedicine solution for remote medical follow-up of patients

As part of the crisis management linked to the COVID-19 pandemic, the agency *eSanté* set up a telemedicine application solution enabling remote monitoring of patients suffering from COVID-19. The aim of implementing this solution was to reduce the risk of contamination for both healthcare staff and patients hospitalised in institutions and other healthcare structures.

The application, which can be downloaded by the patient, monitors patients' state of health at different times throughout the day and automatically triggers an alert with a healthcare professional in charge of their remote monitoring, who then intervenes directly with the patient depending on the seriousness of the situation with a view to medical follow-up.

On the basis of the initial feedback obtained as part of the follow-up of patients suffering from COVID-19, it is planned to continue to develop this application solution for other use cases, i.e. for pathologies other than COVID-19. To facilitate this, the application solution was migrated to the Ideo-PHM solution (Mendix) in February 2021.

New use cases include remote monitoring of obese patients, patients with diabetes, patients with long-term COVID-19, patients who are released early from hospital after surgery and cancer patients.

Increasing the supply of affordable and sustainable public housing

Housing Pact 2.0

The Housing Pact, which came into force in 2008, provides municipalities with funding for the construction of new housing and public infrastructure. This subsidy programme ended in December 2020. Given the high demand for affordable housing in Luxembourg, the government has decided to overhaul the Housing Pact, baptising the new programme "Housing Pact 2.0".

The Housing Pact 2.0 law was passed in July 2021. The project has been very successful, such that by the end of 2022, a total of 99 municipalities had signed the initial agreement, 10 of which have opted for an internal housing adviser and 89 of which are working with an external adviser. Of these 99 municipalities, 45 have signed an implementation agreement.

The signatory municipalities have 12 months from the date of the signing of the initial agreement to draw up a Local Action Plan ("LAP") with the assistance of their housing advisor. Once this has been approved by the local council and forwarded to the Ministry of Housing, the municipality willing to



continue with the Housing Pact 2.0 programme can sign an implementation agreement. The municipality will then have until 2032 to implement the objectives and projects set out in the LAP.

The "Neischmelz" project in Dudelange

The remediation and reclamation of the former "Neischmelz" brownfield site in Dudelange allows for the development of new neighbourhoods and living spaces in a perspective of sustainable development in order to face the shortage of affordable housing.

The ecological component aims to revitalise the brownfields, to promote sustainable development by establishing a CO₂-neutral neighbourhood and to guarantee the quality of the living spaces. The energy concept is based on an initial innovative scenario of a geothermal doublet of between 1,000 and 2,500 metres.

The implementation of this concept is subject to a series of regulatory approvals, including the Environmental Impact Assessment initiated in February 2020, the conclusions and results of which are expected between September and December of 2023.

In parallel, the technical offices appointed by the "*Fonds du Logement*" are making progress on planning of the boreholes. Based on the information from the seismic survey, which will be submitted in December 2023 by the National Roads Administration, the "*Fonds du Logement*" will prepare the tender to start the drilling works in the second half of 2024.



Table 3: RRP Pillar 2 - Green transition

Component	Reforms and investments	Status of milestones & targets	Description
2A: Decarbonisation of transport	Minimum targets for low and zero emission vehicles to be achieved by contracting authorities	Finalised	The transposition of Directive 2019/116110 was accomplished by the Grand-Ducal Regulation on the promotion of clean road vehicles in support of low-emission mobility. The regulation was published in the <i>Mémorial A</i> and took effect on 14/11/2021.
	Support scheme for charging points	In progress	The law on the aid scheme for companies investing in charging infrastructure for electric vehicles was signed on 26 July 2022. Thus, the first call for projects related to this law ended in September 2022 with 29 projects that were selected. The majority of these projects should be finalised from the second quarter of 2023. A second call for projects has been underway since 1 January 2023 and will close on 31 May 2023. In addition, the law dated 26 July 2022 also provides for support exclusively for SMEs. The support exclusively for SMEs has been available since July 2022 and will remain active until December 2024. Currently, 14 applications for SME aid have been approved.
2B: Protection of the environment and biodiversity	"Naturpakt"	In progress	The legal framework of the "Naturpakt" was put in place in 2021 following the publication of i) the law dated 30 July 2021 creating a nature pact with the municipalities and ii) the Grand-Ducal Regulation dated 30 July 2021 establishing the catalogue of measures of the nature pact. Currently, 86 municipalities are involved in the nature pact and the first audit phase is underway.



Decarbonisation of transport

Minimum targets for low and zero emission vehicles to be achieved by contracting authorities

According to Directive 2019/116110 of the European Parliament and of the Council, each procurement entity must achieve a minimum percentage of clean vehicles out of all vehicles put out to tender during five-year reference periods. At national level, about 200 contracting authorities and entities, such as the Luxembourg State, have set higher internal targets. The minimum percentage of clean vehicles at national level will then be above the requirements of the above-mentioned directive.

Accordingly, planning states that at least 38.5% of the light vehicles (category M1 and N1) acquired in the first reference period from 2021 to 2025 correspond to the criteria of clean vehicles. However, it is worth mentioning that the State applies even more ambitious targets for its own vehicle fleet. Since the 2018 budget year only electric cars are stipulated. Exemptions from this rule have to be justified and granted by the Ministry of Environment, Climate and Sustainable Development. Another example of the State setting targets that go beyond the minimum obligations of this directive, is public transport. Half of the kilometres covered by the regional buses of the RGTR are carried out by pure electric vehicles. By 2030, all mileage will be covered by zero emission vehicles.

The transposition of the above-mentioned directive was accomplished by the Grand-Ducal regulation concerning the promotion of clean road vehicles in support of low-emission mobility. The regulation was published in the *Mémorial A* and took effect on 14 November 2021.

Support scheme for charging points

The law on the aid scheme for companies investing in charging infrastructure for electric vehicles was signed on 26 July 2022.

The new subsidies apply to the installation of charging stations accessible to the public and private charging stations in companies. As such, they constitute a coherent set of measures enabling Luxembourg to achieve an efficient network of charging points throughout the country. They complement the aid scheme for the installation of charging points for private individuals, as well as the national network of publicly accessible "Chargy" and "SuperChargy" charging points.

The first type of aid, which benefits all companies regardless of their size, will be awarded following a call for projects for charging infrastructures accessible to the public and to private individuals, with a charging capacity of at least 175 kilowatts. Successful projects will be eligible for a subsidy of up to 50% of the investments related to the roll-out of charging stations. A scoring system ensures that the most publicly accessible projects are favoured in the selection process.

The first call for projects ended in September 2022 with 29 projects selected. The majority of these projects are expected to be finalised by the second quarter of 2023. A second call for projects has been underway since 1 January 2023 and will close on 31 May 2023. The specifications can be downloaded from Guichet.lu.¹⁰

The second support instrument is reserved for small and medium-sized enterprises and aims to facilitate their transition to electric mobility as part of their economic operations. On application, SMEs can receive a subsidy of up to 50% of the costs of charging points and up to 60% of the costs of connecting to the electricity grid. The maximum grant is €60,000 for grid connection costs and €40,000 for other roll-out costs per company.

¹⁰ Specifications for the call for projects concerning the installation of charging infrastructures for electric vehicles in the Grand Duchy of Luxembourg, Tender no. 2023 - 01: <https://guichet.public.lu/dam-assets/catalogue-pdf/aides-meco/cahier-charges/appeel-projets-cahier-charges-fr.pdf>



The grant to SMEs has been available since July 2022 and will remain available until December 2024. At present, 14 applications for SME support have been approved.

Protection of the environment and biodiversity

"Naturpakt"

Through the *"Naturpakt"* or Nature Pact, the government is establishing a legislative, financial, technical and advisory framework for municipalities to facilitate targeted action to promote the protection of nature and to prevent the loss of biodiversity.

The *"Naturpakt"* is based on the Climate Pact model established in Luxembourg as part of the *European Energy Award* (EEA) and is aimed exclusively at municipalities. The *"Naturpakt"* can subsidise the participation of all municipalities in implementing national strategies for the protection and conservation of the natural environment, or in the ecological aspects of these strategies, including the national nature conservation plan, the river basin management plan and the strategy for adaptation to the effects of climate change.

The legal framework of the *"Naturpakt"* was set up in 2021 following the publication of i) the law dated 30 July 2021 creating a Nature Pact with the municipalities and ii) the national regulation dated 30 July 2021, which established the catalogue of measures in the Nature Pact.

An information and awareness-raising campaign about the *"Naturpakt"*, organised by the Ministry of the Environment, Climate and Sustainable Development, immediately convinced 75 of Luxembourg's 102 municipalities to participate in the *"Naturpakt"*. The programme has therefore been a great success since its launch. These municipalities are currently being provided with a nature pact advisor to help them implement the pact in their area and to carry out an initial assessment of the municipality's nature and water protection situation. The first assessments to verify the level of performance of the municipalities involved are currently underway. More than 30 municipalities have already been certified after the first audit. The certified municipalities receive a certification grant and will be rewarded at the *"Naturpakt"* day on 5 May 2023.



Table 4: RRP Pillar 3 - Digitalisation, Innovation and Governance

Component	Reforms and investments	Status of milestones & targets	Description
3A: Promotion of a data-driven economy	Stimulating the creation of a new ecosystem in Luxembourg	In progress	The objective of the reform is to stimulate the creation of a new ecosystem in Luxembourg through the development and implementation of an ultra-secure communication infrastructure based on quantum technology, by promoting the participation of private sector companies and researchers. The consortium, composed of SES Techcom, LuxTrust, InCert,itrust, LuxConnect and SnT, has been involved in the LuxQCI project since the end of 2019 and is actively contributing to the creation of the ecosystem.
	Development and deployment of a test infrastructure and ultra-secure connectivity solutions	In progress	This part of the project consists of developing and rolling out a research infrastructure that will allow knowledge and experience to be gained in the field of communications based on quantum technology. This test infrastructure was launched in March 2022 with the signing of a funding agreement between the Luxembourg government and the University of Luxembourg / SnT. The first milestone was reached in November 2022 when the laboratory became operational. Achieving a connection between two geographically distant points is the next major milestone in the test laboratory.
3B: Modernisation of public administration	Electronic Document Management and Case Management	In progress	This project aims to implement a central platform offering all the functionalities required for electronic document management and case management and to deploy specific instances in each of the candidate state entities. The implementation period extends from mid-2020 to the end of 2025 for the primary implementation of the solution.
	Evolution of the "MyGuichet" platform	In progress	Virtual appointment setting: This part of the project focuses on enabling public administrations to offer virtual appointment setting and to establishing access to a functionality supporting virtual appointments via video conferencing. The pilot project is ongoing and its implementation is planned for 2023.
		In progress	Various C2G and B2G approaches: The second part of this project aims to stimulate the supply of digital services for citizens and businesses. The initiative started in the first quarter of 2021. Its completion had to be postponed to the second quarter of 2023. Ten of the 12 public services for citizens and businesses have been put online.
		Finalised	Mobile App MyGuichet.lu: The transfer of the functionalities offered by the transactional portal MyGuichet.lu to a mobile application is the central objective of the third part of the project. The mobile application has been available to the general public since July 2021 and improves the efficiency of procedures for citizens, companies and businesses.
	"eADEM"	In progress	The eADEM programme is being carried out in three main phases: the development of specifications (phase 1), the selection of a prime contractor for ADEM's new business IT solution (phase 2) and the implementation of the solution (phase 3). In December 2022, an operator was designated. In January 2023, the programme was formally launched. The initialisation phase of the programme runs until 15 May 2023. This phase consists of establishing the organisation and working procedures for the entire 42-month programme. The delivery of the programme study (which sets out the SMART objectives) and the programme management plan (describing the working approach, methods to be applied and a detailed schedule extending to 2026) is scheduled for mid-May.
3C: Promotion of a transparent and fair economy	National Platform for the management of public surveys	In progress	The first phase of the programme was implemented in January 2021 with the launch of the national public enquiry platform. The platform is available to administrations organising public enquiries with the key functionalities available.
	Modernisation of corporate taxation	Finalised	On 10 February 2021, the law amending the amended law dated 4 December 1967 on income tax came into force with the aim of introducing the inadmissibility of interest or royalty expense deductions relating to affiliated companies domiciled in non-cooperating countries and territories for tax purposes with respect to corporate income tax.
	Fight against money laundering and terrorism financing	In progress	In order to encourage registered entities to file with the Register of Beneficial Owners and to keep the information on their beneficial owners up to date, a new bill has been tabled in Parliament which offers a new set of incentives, and even coercive measures, to the RBE registry manager.
		Finalised	As a complement to the 2020 National Risk Assessment (NRA), the Preventive Committee carried out Vertical Risk Assessments (VRAs) that were finalised in February 2022.
3C: Promotion of a transparent and fair economy	Fight against money laundering and terrorism financing	Finalised	In the area of trust and company service providers (TCSPs), the Ministry of Justice took delivery of the finalised study on strengthening the legal framework for TCSPs drafted by an external expert.



Promoting a data-driven economy

Stimulating the creation of a new ecosystem in Luxembourg

The objective of the reform is to stimulate the creation of a new ecosystem in Luxembourg through the development and implementation of an ultra-secure communication infrastructure based on quantum technology, by promoting the participation of private sector companies and researchers.

The consortium, consisting of SES Techcom, LuxTrust, InCert, itrust, LuxConnect and SnT, has been involved in the LuxQCI project since the end of 2019 and is actively contributing to the creation of the ecosystem. The test lab developed by SnT is a key phase of the project and became operational in the fourth quarter of 2022. The Luxembourg response to a call from the Digital Europe Programme (DEP call) also shows that this ecosystem is being extended to other players such as Restena. The DEP call was signed with the European Commission at the end of 2022 and aims to further develop and roll out the terrestrial quantum communications network, both by extending the network to other points and by experimenting with various technical solutions. Another development point concerns the link between the space segment and the ground segment.

This year, another important phase will begin, namely the planning and construction of the first optical earth station to link the satellite to the ground segment.

The impact of the LuxQCI project on the ecosystem related to quantum technologies in Luxembourg is already perceptible, as new hires have been made or are planned at SES Techcom and SnT.

Development and deployment of ultra-secure test infrastructure and connectivity solutions

This part of the project consists of developing and rolling out a research infrastructure that will enable knowledge and experience to be gained in the field of quantum-based communications.

This test infrastructure was launched in March 2022 with the signing of an agreement between the Luxembourg government and the University of Luxembourg / Interdisciplinary Centre for Security, Reliability and Trust (SnT). The SnT will be tasked with setting up this test infrastructure, which will be operational for a period of five years and will enable the SnT and any national or European player to carry out experiments in the field of quantum communications.

The next major step for this test infrastructure, scheduled for the second quarter of 2023, is to achieve a connection between two geographically distant points, given that a connection has been successfully achieved inside the laboratory.

Modernisation of public administration

Electronic Document Management and Case Management

This project aims to implement a central platform offering all the functionalities necessary for electronic document management (EDM) and case management and to deploy specific versions in each of the candidate State entities.

The investment is aimed at the internal processes of public administrations that will be able to benefit from the use of this central platform. Subsequently, the project is aimed at the general public, in particular by supporting the exchange of documents on MyGuichet.lu.

Initially planned to run through to the end of 2025, the implementation period has been extended to 2027 for the main roll-outs of the solution due to its complexity as well as its implementation within the administrative entities.

Rendering the central platform operational allows for the electronic management of documents and document exchanges in public administrations. Initially planned for the fourth quarter of 2021, this component went into product at the beginning of 2022.

The new EDM and Case Management solution will be operational in five government entities to improve their document management in the last quarter of 2024. The deployment of these individualised solutions will be carried out by the CTIE. To date, 11 projects have completed the approval phase.

The project calls for availability of three specific modules on the corresponding platform for the automation of generic procedures in the last quarter of 2024. The first standard module has been available since 2022. The other two are in development.

With a view to electronic invoicing, laid down by the law dated 13 December 2021, the development teams have implemented a module for centralised receipt and management of electronic invoices. The module allows for a standardisation of the process of receiving electronic invoices based on the reception, storage and management of all electronic invoices sent to the Luxembourg State within a single system. This module was deployed as a pilot at the Ministry of Digitalisation and the CTIE in 2022, and is now in place at all ministries and administrations starting in 2023. Each state administration should therefore have access to the 'Hive' programme at the end of the roll-out of this module and be able to familiarise itself with the new software even before its dedicated on-boarding project is completed.

Evolution of the "MyGuichet" platform

Virtual appointment booking

This part of the project aims to enable public administrations to offer virtual appointment setting and to establish access to a functionality supporting virtual appointments via video conferencing. Citizens and businesses will be able to avoid appearing at a physical location. This part of the project is aimed at the general public, and more specifically at citizens as well as companies and businesses.

The pilot project has been underway since 2022 in collaboration with the National Health Fund (CNS). Once the pilot project has been completed, it is planned to integrate this development into the MyGuichet.lu platform.

Various C2G and B2G approaches

The second part of this project aims at stimulating the offer of digital services for citizens and companies. The main objective is to introduce new procedures by the CTIE, namely three authenticated procedures, three procedures without authentication, three "eDelivery" projects and three additional procedures. This part of the project is aimed at the general public, and more specifically, at citizens as well as companies and corporations. The procedure aims to support twelve new projects in the MyGuichet.lu platform.

In the course of 2022, five procedures were completed: two authenticated procedures, one procedure without authentication and two eDelivery interfaces. Ten of the 12 services for citizens and businesses were thus successfully completed.

The launch of the two authenticated sources had to be postponed until the first half of 2023.

Mobile App MyGuichet.lu

The transfer of the functionalities offered by the transactional portal MyGuichet.lu to a mobile application is the central objective of the third part of the project.

In July 2021, Marc Hansen, Minister Delegate for Digitalisation, presented the new mobile application MyGuichet.lu, developed by the Government IT Centre (CTIE). The mobile application is accessible to the general public and improves the efficiency of procedures for citizens, businesses and companies. It allows access to the functionalities of the desktop version of MyGuichet from a mobile phone, such as procedures, authentic sources and communications. The application can also be used to scan and upload a document. In this way, a smartphone replaces a scanner.

This part of the project is aimed at the general public, and more specifically, at citizens as well as companies and businesses. The number of administrative procedures that can be carried out via the application will increase over the coming months. The number of administrative procedures that can be carried out via the application will thereby continue to grow.

New functionalities have been added to the application during 2022:

- Electronic signature: adding this feature has made available several additional steps in the app that require an electronic signature such as declaring a change of usual residence or applying for postal voting for elections.
- Storing administrative documents in one's personal space on MyGuichet.lu: through its ability to use the native functionalities of a smartphone, the app allows users to easily scan documents with the camera of their smartphone. The digital copies of the documents are then saved in one's personal space and can be used as supporting documents for procedures carried out on MyGuichet.lu.

"eADEM"

This investment consists in helping ADEM to identify functional and non-functional requirements and to determine the specifications for the purchase or development of a centralised management application system specific to the Luxembourg public employment service (called "eADEM"). The project team is supported by an external consultancy firm in order to successfully implement the digital transformation of ADEM with the new "eADEM" project.

In order to develop the specifications, the project was divided into several work packages: functional specifications, non-functional requirements, public procurement approach, communication/exchange management and programme management. Requirements are compiled in targeted workshops with ADEM staff and a selection of jobseekers and employers.

In January 2022, the call for tender and the eADEM specifications were published via the Public Procurement Portal and were available to pre-qualified suppliers. The supplier was officially selected in December 2022, making it possible to launch the implementation phase in January 2023, which is scheduled to last until 2026 (42 months). An initial version of the eADEM system, dedicated to the implementation of functionalities relating to ADEM's financial aid, should be operational in the last quarter of 2024. Digital assistants of the MyGuichet portal, linked to eADEM, are also planned for release to the public starting in the fourth quarter of 2024.

The ADEM 2025 strategy is a medium-term work programme that will mobilise ADEM's staff in the face of the operational and digital transformations that eADEM will necessarily undergo.

National Platform for the management of public surveys

The project focuses on the development of a national platform for the management of public survey procedures consisting of an Internet portal, a back-office and a MyGuichet.lu assistant.

The financial support of the public enquiry platform aims at centralising the publication of public enquiries, consulting their files on a single website and increasing their visibility to facilitate access

and visibility of enquiries for citizens. Finally, the project seeks to make the process more effective by digitising all the steps online. In order to ensure social inclusion, a physical solution will still be available. The general public, State and municipal administrations and civil society organisations are targeted by this measure.

The first phase of the programme was implemented in January 2021 with the launch of the national platform for public enquiries. The national platform is available to all administrations organising public enquiries with key functionalities available, including the management and publication of public enquiries and documents. In addition, there is a functionality for the general public to submit their contribution to an online enquiry. Currently, 24 out of 58 procedures have been integrated.

The process of integrating the 102 municipalities in the country that apply to use the platform as organisers of public enquiries is planned for the end of 2023. At present, onboarding has been completed for 16 municipalities, and 19 municipalities have access to the test environment. In 2023, several other municipalities will consider completing the onboarding process.

Promotion of a transparent and fair economy

Modernisation of corporate taxation

Luxembourg has long been committed to the fight against tax fraud and evasion. For several years now, Luxembourg has been regularly reinforcing its tax legislative framework with far-reaching measures, in particular to counter aggressive tax planning.

With regard to the issue of outgoing payments as mentioned in recommendation No. 4 of 2019, it is worth highlighting the law dated 10 February 2021 amending the amended law dated 4 December 1967 on income tax.

The measure seeks to put an end to tax planning practices that still exploit certain provisions of the tax system in relation to outbound payments and is a direct response to the recommendation of the Council of the European Union that Luxembourg "*address the features of the tax system that may facilitate aggressive tax planning, in particular through outbound payments*".

The measure consists in denying deductions of interest or royalty expenses due by a Luxembourg resident taxpayer to a related company established in a country or territory which is non-cooperative for tax purposes and which is included in the European Union's list of non-cooperative jurisdictions for tax purposes (Appendix I). As such, it contributes to combating certain aggressive tax planning structures which result in outbound interest and royalty payments made by Luxembourg-based companies to such jurisdictions escaping taxation or being taxed at a low level because such payments - in particular to jurisdictions which do not operate a corporate tax regime or which apply zero or near zero nominal corporate tax rates - are otherwise not subject to any taxation, or are only taxed at very low levels in the recipient's jurisdiction.¹¹ The effectiveness of this measure in dealing with low or double non-taxation situations stems from the adjustment of the Luxembourg tax base by adding back the amount of interest or royalty payments made to these jurisdictions, thereby significantly reducing any incentive for a resident taxpayer to set up financing structures involving such jurisdictions.

All of the above measures, especially the measure introduced by the law dated 10 February 2021, constitute an adequate and decisive response by Luxembourg to this challenge. These measures will be supplemented in the future by the progressive implementation in Luxembourg law of more specific measures aimed at resolving residual instances of tax base erosion and profit shifting and ensuring

¹¹ European Commission's 2020 Report for Luxembourg, published on 26 February 2020 as part of the European Semester.

that companies operating internationally pay at least an effective minimum tax (Pillar 2) arising from the global agreement at OECD level.

Fight against money laundering and terrorism financing

Draft law no. 7961 on the transformation of the Trade and Companies Register (hereinafter RCS) was submitted on 27 January 2022. This law also aims to modify the register of beneficial owners (hereinafter RBE). As with the RCS, it is expected to offer the same range of incentives and even coercive measures to the manager of the RBE so that this person has the required levers to induce registered entities to file their declaration with the RBE and to keep the information on their beneficial owners up to date.

In the area of trust and company service providers (TCSPs), the Ministry of Justice has engaged the services of an external expert to prepare a study to strengthen the regime applicable to TCSPs. On the basis of the conclusions and recommendations of this study, the law dated 29 July 2022 (amending certain provisions of the amended law of 12 November 2004 on the fight against money laundering and terrorism financing, the AML/CFT Law) set out in a more specific manner certain key concepts relating to the scope of application of TCSP activities. These clarifications of the scope of TCSP activities thus allow for a strengthening of the supervision and, where applicable, the registration obligation of TCSPs (not otherwise subject to AML/CFT supervision). The clarification of the activities of TCSPs also allows for a more focused application of sanctions in case of non-compliance with the related professional obligations.

3.2. Other policy responses to the major economic, employment and social challenges

After the temporary adaptation of the European Semester in 2021 to ensure coordination with the Recovery and Resilience Facility (RRF), the European Semester has resumed its broad economic and employment policy coordination in its 2022 cycle, while further adapting to the needs of implementing recovery and resilience plans. The 2023 European Semester will continue in this vein.

In this context, this NRP aims to provide sufficiently comprehensive information on Luxembourg's implementation as well as on reform and investment initiatives. Furthermore, it is worth recalling that the envelope that has been allocated to Luxembourg under the EU RRF is marginal compared to that of other Member States. The total envelope amounts to 0.1% of GDP, which is the lowest rate among the Member States. It is therefore not a question of reducing the measures taken by the government in the context of specific recommendations for Luxembourg to solely the components of the RRP, but also of taking into account the many additional measures taken by the government other than of this plan.

Accordingly, in addition to completing the report required twice a year by Article 27 of the RRF Regulation, the 2023 NRP also serves to provide information on reforms and investments undertaken outside the framework of the RRP. The challenges addressed in this section stem from specific recommendations for Luxembourg issued in 2022. As a result, the topics covered in this section are relatively broad and range from fiscal policy in the current crisis to the promotion of equality in the education system, as well as many other issues.

One area that is not specifically addressed in the challenges, although it is important for the overall development of the country, is spatial planning. By ensuring optimal living conditions for the entire population through the sustainable development of all parts of the national territory, spatial planning policy plays a central role in the reflections and measures concerning the green, digital and inclusive transition as well as in implementing the United Nations Agenda 2030. Its role of foresight, design,

organisation and monitoring is exercised in its cross-sector coordination function, both horizontally and vertically.

The new Spatial Development Master Plan (PDAT) - which defines an integrated strategy for the sectoral plans affecting spatial development and sets out the guidelines, political objectives and measures of the government and the municipalities - will probably be adopted in the spring of 2023, following the consultation period with the municipalities.

As part of the PDAT revision, territorial visions for the country's three urban agglomerations, namely the *Nordstad*, the Central Agglomeration and the Southern Region, have been developed by the Department of Spatial Planning in cooperation with the respective municipalities. The aim of these visions is to promote sustainable urban development and efficient land use while supporting climate and ecological transition processes.

In order to assimilate the climatic and environmental challenges of territorial development, an urban-architectural and landscape consultation called "Luxembourg in Transition - *Spatial visions for the low-carbon and sustainable future of the Luxembourg functional region*" was launched in June 2020 as part of the PDAT's revision effort, and was completed in January 2022. It assembled strategic spatial planning proposals, produced ecological transition scenarios for 2050 and recommended specific transition projects that will be partly integrated in the new PDAT.

Fiscal policy in the current crisis

Fiscal policy in 2023 focuses on protecting households and businesses from inflationary pressures on the one hand, and on following through on the government's commitment to the qualitative and sustainable development of the country in the coalition agreement on the other.

After the implementation of two complementary packages of measures (*Energiedësch* and *Solidaritéitspak 1.0*) in March 2022 to mitigate the inflationary effects on the most vulnerable companies and households, the social partners agreed on an additional support package, Solidarity Package 2.0, in September 2022. This contains measures to mitigate inflation and support households and businesses.

In view of the risk of an inflationary shock at the beginning of 2024 if the measures in *Solidaritéitspak 2.0* were to be discontinued on 31 December 2023, the government decided in March 2023 to extend certain measures to mitigate price pressures on the one hand and fiscal measures to strengthen the purchasing power of households on the other (*Solidaritéitspak 3.0*). This is the fourth package of measures resulting from the meetings of the tripartite coordination committee, with a budgetary envelope of €1,350 million, or 1.7% of GDP. The government's interventions, including state guarantees, amount to a total of €3,679 million, or 4.5% of GDP.

In parallel with the above-mentioned efforts, Luxembourg is continuing to provide the humanitarian assistance required in the context of Russia's war of aggression against Ukraine, to ensure the accommodation of people fleeing the country and to guarantee the educational follow-up of refugee children in Luxembourg's school structures.

Medium-term budget positions

In the medium term, a prudent, forward-looking and responsible approach is maintained. The impact of the temporary support measures on the central government balance should gradually dissipate.

The maintenance of the public debt level below the 30% of GDP ceiling agreed in the coalition agreement demonstrates the government's commitment to sound and sustainable public finances.

Long-term sustainability of the pension system

Luxembourg's social security system covers the various risks of life: illness, accidents at work, old age and dependency in particular, which are supplemented by family allowances and unemployment benefits.

The system is financed by contributions to which are added contributions from the State budget to finance the benefits provided, in cash or in kind. In the case of pension insurance, for example, the State contributes one third of the contributions, as do the insured and the employers, each of which also contribute one third.

Financial predictability is therefore a key element in the sound financial management of such a system, both at the overall level of social security (with transfers from the State budget) and directly in terms of budgetary impact (State contributions).

Accordingly, the various pillars of social security are regularly monitored to ensure that the benefits provided are in line with the requirements of insured persons and that their financial sustainability is guaranteed over a given period, which varies according to each pillar of social security.

These monitoring and predictability mechanisms have been strengthened or extended in recent years by specific legislative provisions introduced or extended during the reforms. This applies in particular to pension insurance and also to long-term care insurance, which, by the very nature of their benefits, require medium- and long-term anticipation.

The results of the analyses carried out through the legal mechanisms or on an ad hoc basis are discussed with the social partners - who are key players in the management of the pillars since they are an integral part of the decision-making bodies of the social security institutions, depending on the burden of contributions - and other stakeholders in order to ensure good strategic management and long-term viability of each pillar.

General pension insurance scheme

With regard more specifically to the general pension insurance scheme, the latest major reform of which came into force on 1 January 2013, the legislation provides that the General Inspectorate of Social Security (IGSS) shall carry out for each ten-year period of coverage both a technical and actuarial forecasting report which serves as a basis for determining the overall contribution rate for the period of coverage and an actuarial assessment in the middle of the ten-year period of coverage. In practice, this amounts to a report on the general pension insurance scheme every five years.

The 2013-2022 coverage period has just ended and the current coverage period started on 1 January 2023 and runs until 2032. The IGSS therefore carried out its technical review in 2022. Following this report, presented on 26 April 2022¹², the Government Council set the overall contribution rate for the period 2023-2032 and also decided on the follow-up to the report, as well as the results and conclusions contained therein.

The Government Council decided to maintain the overall contribution rate at 24%, divided equally between employees, employers and the state, since the requirements for this were met.

The technical assessment shows that the scheme's reserve is still well above the legal minimum (set at 1.5 times the annual benefit level) over the entire 2023-2032 coverage period. In fact, the reserve is even expected to grow in absolute terms over the next period. As a result, an increase in the rate is not appropriate and so the current level stands.

¹² Communiqué of 26 April 2022 : https://gouvernement.lu/fr/actualites/toutes_actu/actualites/communiqués/2022/04-avril/26-haagen-pensions.html

Given the importance of the long-term sustainability of the general pension insurance scheme, which concerns all affiliated persons and takes into account inter-generational equality aspects, the report was presented to the public on 26 April 2022 so that all stakeholders could consult it. In addition to this report, the IGSS also published an overview of Luxembourg's public pension schemes as part of Supplementary Table 29 of the National Accounts¹³, which provides additional technical information regarding the link between the European System of Accounts and pension schemes in Luxembourg.

In addition to maintaining the contribution rate at 24%, and in line with the IGSS's actuarial assessment, the Government Council also decided to refer the matter to the Economic and Social Council (CES)¹⁴ with this technical assessment in order to analyse, discuss and recommend possible ways of ensuring the financial sustainability of the general pension insurance scheme over the very long term.

While it is true that the scheme is viable in the short and medium term, there are challenges in the long and very long term given the demographic trends that concern all EU countries, and Luxembourg is no exception to the rule. It is with a view to sustainability that the 2012 reform, which came into force on 1 January 2013, incorporated various mechanisms and parameters into the general pension insurance scheme. According to the results of the IGSS work included in the 2022 assessment, these measures should make it possible to reduce scheme expenditures by between 3.7 and 5.5 percentage points of GDP by 2070, depending on the adjustment moderator applied.

The referral of such an important issue to the CES is in line with the government's desire to involve the social partners in discussions of substance that concern the whole of society. It should be remembered in this respect that the last IGSS actuarial assessment presented on 2 December 2016¹⁵ had already been reviewed within a group of experts appointed by all the stakeholders. This group had been set up by the government of the 2013-2018 legislation period. However, the government does not want to limit the debate only to experts, but broadening it through a platform that aims to conduct such substantive exchanges, which is the CES. Work on this subject is currently underway within the CES. Once the CES will have submitted its report to the government, the government will decide on what steps to take next.

Long-term care insurance

The government has undertaken a reform to modernise long-term care insurance, which had 16,062 beneficiaries as at 31 December 2021 (latest consolidated data), in order to meet the challenges of demographic change and to continue to guarantee fair access to quality benefits¹⁶. The main objectives of the reform, which came into force on 1 January 2018, are to provide a more individualised approach in delivering quality benefits that meet the daily needs of each person, to boost quality by means of clear standards and criteria with adequate controls, to simplify procedures and to consolidate the system in the light of societal changes and in compliance with the fundamental principles of the 1998 Basic Law.¹⁷

In addition, the reform has set up tools for better monitoring of the entire long-term care insurance system, so as to better anticipate future changes and the financial balance of the system. This is achieved by drawing up analyses and reports on the quality of the services provided via a long-term care insurance assessment and control administration (*Administration d'évaluation et de contrôle de l'assurance dépendance* - AEC) and assessing how appropriate packages established with the reform

¹³ Overview no. 16, IGSS : <https://igss.gouvernement.lu/fr/publications/apercus-et-cahiers/apercus/202203no16.html>

¹⁴ See: <https://ces.public.lu/fr/ces.html>

¹⁵ Communiqué de 2 December 2016: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2016/12-decembre/02-bilan-assurance-pension.html

¹⁶ Communiqué of 21 June 2016: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2016/06-juin/21-schneider-copas.html

¹⁷ Law dated 29 August 2017: <https://legilux.public.lu/eli/etat/leg/loi/2017/08/29/a778/lq>

are with regard to real requirements in terms of basic day-to-day tasks (IGSS), the last report of which was produced in 2021¹⁸. The AEC quality report was published in 2022¹⁹.

In addition to this analysis of the quality of services, the AEC also carried out a satisfaction survey of beneficiaries living at home and their caregivers. This report was presented in June 2022²⁰ and analyses the role of a caregiver in daily life. This analysis also focused on options to better support caregivers in their tasks. The various options are currently being implemented, or have already been partially implemented. Those that require legal changes will be discussed at a later stage with the relevant actors.

In connection with this, it should be pointed out that it is a priority for the government to involve the social partners, and more broadly all stakeholders, as far as possible in the development and implementation of the various reforms by means of coordinated action. This approach aims to ensure that the reforms are also driven as much as possible by the stakeholders and to continue to ensure access to quality benefits in the future while ensuring the financial balance of the different social security pillars. Indeed, in addition to the financial balance which must obviously be ensured, the level of benefits under each pillar is equally important, both in terms of pensions, health care (health insurance) and the need for assistance in the basic activities of daily living (long-term care insurance).

This priority is therefore in line with the United Nations' sustainable development goals²¹ and, more specifically, with those aimed at providing access to accessible and high-quality social security benefits for all protected persons. This also applies to pensions, which must be sufficient to allow all beneficiaries to live in dignity, particularly pensioners who had low incomes throughout their working lives.

The same applies to benefits aimed at maintaining a certain degree of independence to beneficiaries who need support from a third party (dependent persons).

Implementation of the Recovery and Resilience Plan (RRP)

Significant progress has been made in recent months in the implementation of the RRP. As of 23 December 2022, Luxembourg submitted its first RRF payment claim for a total of €24.9 million. This first claim represents almost half of the milestones and targets of the national RRP (26 out of 60 milestones and targets in total).

For more details on the implementation of the Luxembourg RRP, please refer to section "3.1 Status of the projects funded under the RRF".

The Green and Digital transition

Fiscal policy in 2023 is fully geared towards qualitative growth and pursues an ambitious investment policy focused on the dual energy and digital transition, access to housing, and mobility and public infrastructure. The measures stemming from the "*Energiedësch*" and the three "*Solidaritëtspak*" complement the government's efforts to stimulate energy efficiency and reduce dependence on fossil fuels. In all, public investment at central government level (direct and indirect investment) amounts to €3.3 billion (4.1% of GDP) in 2023, an increase of +22.1% compared to 2022. Approximately 16.0% (€530 million) of this planned investment expenditure in 2023 is devoted to projects of more than €40 million in the field of environmental and climate protection.

¹⁸ Forecast analysis report 2021: <https://igss.gouvernement.lu/fr/publications/rapport-previsionnel-2019/2021/rapport-analyse-previsionnel-2021.html>

¹⁹ Biennial Quality Report 2020: <https://aec.gouvernement.lu/fr/publications/rapport-biennal-qualite/rapport-biennal-qualite-2020.html>

²⁰ Communiqué of 9 June 2022 : https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2022/06-juin/09-haagen-aec.html

²¹ Luxembourg 2030: 3rd National Plan for Sustainable Development: <https://environnement.public.lu/dam-assets/documents/developpement-durable/PNDD.pdf>

In addition to the above-mentioned investment programme, the reforms and investments planned in the Luxembourg Recovery and Resilience Plan are being implemented. Indeed, in the Luxembourg RRP, the share of investments contributing to the fight against climate change is well above the 37% threshold required by the applicable regulation. Like the green transition, the digital transition is also crucial for Luxembourg's development. The government is therefore investing heavily in this area, notably in the framework of the RRP. Below is a short presentation of some key actions in the fields of green and digital transition (non-exhaustive list).

Ons Wirtschaft vu muer

The "*Ons Wirtschaft vu muer*"²² roadmap is based on the lessons learnt from the pandemic, on the reflections initiated in the framework of the Rifkin process, on the global megatrends to which Luxembourg is exposed as well as on already existing governmental strategic orientations, notably in the fields of the circular economy, artificial intelligence or digitalisation. The document also includes measures contributing to the EU's combined objectives of climate neutrality by 2050 and global leadership in the digital revolution.

Luxembourg Stratégie

Created in 2020, this strategic foresight department of the Ministry of Economy aims to prepare the long-term future of the Luxembourg economy. It conducts prospective studies (futures studies or *Zukunftsstudien*) to enhance political decision-making and support its consistency, to support the methodological approach of governmental foresight, to develop future scenarios and a strategic vision for the economy, to evaluate its physical characteristics and transformation levers, to contribute to its integrated modelling and to drive the public debate. Accordingly, it deepens and extends the collaborative approach initiated in 2016 with the long-term strategic study on the Third Industrial Revolution ("Rifkin process" or "TIR2050").

In April 2022, Luxembourg Strategy started the ECO2050 project aimed at developing future scenarios and a strategic vision for the Luxembourg economy in 2050. The governance of the project relies mainly on an inter-ministerial political steering committee, technical working groups, a committee of experts, mainly national and large regional, in foresight and the general public. It includes representatives of ministries and public observatories, trade unions, chambers and professional federations, parliament, municipalities, companies, the research community and civil society. By 31 December 2022, almost 1,000 people had already been involved. Three plausible, distinct and coherent future scenarios for the Luxembourg economy in 2050 emerged from this collective intelligence process: "socio-economic somnambulism", "bio-regional circularity" and "techno-digital optimism". In response, elements of a strategic vision were provided to avoid or mitigate the threats and seize the opportunities presented by these scenarios. These elements will be developed in 2023. From 2 December 2022 to 16 January 2023, the scenarios were the focus of a public campaign to draw up the outlines of these components of the strategy. For this purpose, a questionnaire survey was conducted in Luxembourgish, French, German and English via the "*Zesumme Vereinfachen*" platform of the Ministry of Digitalisation. Nearly 650 people took part in this study and nearly 70 participants were given the opportunity to exchange views directly with the Minister for the Economy during two lunch debates.

In 2022, *Luxembourg Stratégie* completed or initiated three study projects with three different research centres or think tanks. One study focused on the physical quantification of the economy (in collaboration with The Shift Project; completed in June 2022), another on the physical vulnerabilities and risks of the economy (RISK2050 study with the University of Luxembourg) and the third on the

²² "*Ons Wirtschaft vu muer*" roadmap: <https://meco.gouvernement.lu/fr/publications/strategie/strategie-ons-wirtschaft.html>

social desirability of economic transformation (SOC2050 study with LISER). The RISK2050 and SOC2050 studies will continue in 2023. The first aims to design an adaptation and resilience plan for the economy in the face of the most significant risks identified. The second seeks to better understand the behaviour and decision-making mechanisms of economic actors (especially consumers) in order to support the ongoing transitions. These different studies will serve to improve the robustness and facilitate the implementation of the ECO2050 strategic vision.

Strategy for a circular economy

The "Strategy for a circular economy Luxembourg (*Strategie Kreeslafwirtschaft Lëtzebuerg*)" published in 2021 seeks to implement a common understanding of the circular economy and offers a toolkit to engage public and private parties and implement the strategy through projects in sectors of importance to the Luxembourg economy. An inter-ministerial group monitoring the circular economy strategy meets bimonthly to make progress on the various subjects and projects identified jointly, and regularly provides content for the dedicated website²³. It is constantly being expanded with specific cases of application and is a point of entry for people wanting to find out more or get in touch with public players. In parallel, a newsletter with current topics on the circular economy is distributed monthly.

Product Circularity Data Sheet

The "Product Circularity Data Sheet"²⁴ initiative to provide reliable data on the circular characteristics of products is being continuously fostered and developed. The draft of an international industry standard under the auspices of ISO, which was launched in April 2021, shows the continued interest in this topic as more than 70 experts from 50 different countries are involved. Under the ILNAS secretariat, Luxembourg is the coordinator of the new Working Group 5 under the ISO/TC323 technical committee. Luxembourg is also the official publisher of this future ISO/PWI 59040 standard. The method for defining and exchanging such a circular data set for each product will ensure that the confidentiality of this commercially sensitive data is preserved, while not representing a prohibitive administrative burden for companies. The IT structure to support this data exchange has been validated by a proof of concept. As the project has reached sufficient maturity to guarantee a self-sustaining progression, the EIG "Terra Matters" was created at the end of 2022 to accomplish this task together with the Chamber of Commerce.²⁵

Sustainable construction and construction 4.0

In 2022, the Ministry of the Economy joined forces with the construction sector to create the economic interest grouping "Neobuild GIE", whose purpose is to be the benchmark in terms of technological and regulatory monitoring for the entire Luxembourg construction sector, so that it can remain at the forefront of progress in its main disciplines, which are divided into two headings: sustainable construction (materials, circular construction, healthy buildings) and construction 4.0 (digitisation, automation, assembly techniques on site).

The "Fit 4 Sustainability" programme

Following the example of other "Fit 4" programmes in the field of digitalisation and innovation for SMEs, the new "Fit 4 Sustainability" programme launched by Luxinnovation²⁶ gives companies access to external expertise for their decarbonisation and ecological transition projects, as well as to state co-financing to partially cover consultancy costs and possible investment costs.

²³ See: <https://economie-circulaire.public.lu/fr.html>

²⁴ See: <https://pcds.lu/>

²⁵ Communiqué of 14 February 2023: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2023/02-fevrier/14-gie-terra-matters.html

²⁶ See: <https://www.luxinnovation.lu/innovate-in-luxembourg/fit-4-performance-programmes/fit-4-sustainability/>

In practice, this coaching and co-financing programme offers companies the possibility of having the environmental impact of their activities assessed and receiving various recommendations on how to reduce this impact.

The Fit 4 Sustainability programme is also a gateway for companies to prepare more elaborate projects that may be eligible for state aid for environmental protection measures.²⁷

Sharing economy²⁸

In August 2022, the first measures to promote and develop the sharing economy in Luxembourg were introduced. These measures are part of a roadmap detailing operational recommendations and several pilot projects that emerged from a study by the Ministry of Economy. The objective of this study was to review the different business models and public mechanisms used in other countries, to identify the elements that hinder or favour the roll-out of the sharing economy in Luxembourg and to analyse the ways in which economic activities in this field could be developed.

In the context of this study, given that there is no single clear and precise definition, it was decided to define the sharing economy as an economic model that makes it possible to organise the short-term sharing and provision of durable goods between actors, in return for a transaction that creates economic added value. It has a number of competitive advantages such as saving time, money and making better use of resources.

To stimulate the development of the sharing economy, nine measures have been identified to raise awareness, provide a framework, support and finance project initiators, existing companies and existing and future users. In addition, there are four pilot projects.

Sustainable Composite Materials and Manufacturing Innovation Center²⁹

In December 2022, the innovation centre dedicated to sustainable composite materials and processes (Sustainable Composite Materials and Manufacturing Innovation Center) was inaugurated by the materials department of the Luxembourg Institute of Science and Technology (LIST). The aim of this new structure is to develop composite materials with a very limited carbon footprint and to demonstrate their benefits through demonstrations of tangible applications for the automotive, rail, space, aeronautical and future urban air mobility sectors.

Aid scheme for environmental protection³⁰

A simplified and practical guide has been drawn up to make companies aware of the opportunity to undertake environmental protection measures, and to encourage them to make use of the aid available to reduce the financial burden of such measures. It focuses on financial aid (under the amended law dated 15 December 2017 on an aid scheme for environmental protection) likely to be of interest to the greatest number of companies, namely:

- Aid for environmental studies to:
 - Evaluate the impact of a company's activity on the environment and obtain various recommendations to reduce this impact in the short or long term (Fit 4 Sustainability programme)

²⁷ See: <https://guichet.public.lu/fr/entreprises/financement-aides/aides-environnement.html>

²⁸ Communiqué of 12 August 2022: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2022/08-août/12-economie-partage.html

²⁹ Communiqué of 12 December 2022: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2022/12-decembre/22-fayot-meisch-inauguration.html

³⁰ Communiqué of 2 December 2022: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2022/12-decembre/02-entreprises-aide-environnement.html

- Obtain specific expertise (choice of technology, investment budget, quantification of environmental impact, etc.) with a view to making an investment in environmental protection (art. 14 of the Law)
- Support for investment in technologies or facilities that exceed applicable environmental standards (Art. 4 of the Law)
- Investment aid for energy efficiency measures (Art. 6 of the Law)
- Investment support for renewable energy production (Art. 9 of the Law)

Circular by Design Challenge³¹

A new call for entries for the third edition of the Circular by Design Challenge was launched in November 2022. As the consequences of climate change and scarcity of resources are increasingly felt, the need to change our current production and consumption patterns is clear. The Circular by Design Challenge was launched in 2020 to address this challenge. The aim of the Circular by Design Challenge is to encourage companies and entrepreneurs to develop products and services that will contribute to a more circular and sustainable world.

Other green transition measures

In addition to the above-mentioned measures, a range of other actions and measures within the framework of climate, energy and sustainable development policies are presented in the PNEC and the PNDD.

The National Energy and Climate Plan (PNEC) forms the basis of Luxembourg's climate and energy policy and describes the policies and measures to achieve the ambitious national targets for greenhouse gas emission reduction (-55%), renewable energy (25%) and energy efficiency (40-44%) by 2030. The National Plan for Sustainable Development (PNDD) specifies the areas of action, objectives and measures to be taken with a view to sustainable development. It should be noted that the PNEC is currently being updated and a draft update is expected to be submitted to the European Commission by summer 2023.

In addition, a range of other actions and measures related to the green transition are presented in the following sections of this document, including in particular the section "Reducing dependence on fossil fuels".

Extension of the House of BioHealth³²

The third extension of the House of BioHealth (HoBH) was opened in January 2023. The House of BioHealth is a unique structure in Luxembourg that provides turnkey accommodation for innovative companies in the fields of biotechnology and digital health technologies. By providing space that can be converted into laboratories, the HoBH ensures that companies can quickly become operational with their R&D activities. Spread over three phases, this project represents an investment of approximately €60 million for a total surface of 15,000 m² spread over 9,500 m² of laboratories and 5,500 m² of office space.

Joint public-private calls for projects

Since 2021, the Ministry of the Economy, in partnership with the National Research Fund (FNR) and Luxinnovation, has launched three calls for joint public-private projects to encourage collaboration between national companies and public research players. So far, three areas have been addressed: health technologies, defence for dual-use products and high-performance computing. The objective

³¹ Communiqué of 7 November 2022: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2022/11-novembre/07-fayot-circular-by-design.html

³² Communiqué of 12 January 2023: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2023/01-janvier/12-house-biohealth.html

of these competitions is to encourage close and interactive cooperation between private companies and public research institutes (PPP - public-private partnerships) by providing financial support to innovative research projects.

Launched in April 2021, the first call for projects "Joint Call HealthTech", developed by the Ministry of Economy in conjunction with the National Research Fund and with the support of Luxinnovation, resulted in the selection of four projects for funding in the first quarter of 2022, with a total budget of €6.1 million. Some €4.5 million of co-financing comes from the Ministry of the Economy and the FNR, while the remaining €1.6 million is made up of equity contributions from companies or research organisations. The main objective of the Ministry of Economy with this initiative is to promote the establishment of a collaborative research culture between public research, healthcare organisations and Luxembourg HealthTech companies in order to co-develop and validate, at clinical level or in real-life conditions, innovative digital health products focused on patients' needs, thus demonstrating their benefits. In addition to accelerating the commercialisation of the innovative digital health products validated under this initiative, these projects should also have an impact on Luxembourg's healthcare professionals and patients in terms of accelerating the adoption of innovative digital health technologies: by facilitating their access and allowing them to use these products in a well-defined and controlled clinical trial setting, the PPP HealthTech projects make the benefits of these innovative tools tangible in terms of diagnosis, monitoring or management of a pathology. Building on this initial success, the Ministry of the Economy, in partnership with the FNR and with the support of Luxinnovation, has prepared a new edition of the Joint Call Healthtech in 2022. This second joint call for Healthtech partnerships was launched in early February 2023.

House of Cybersecurity³³

The new premises of the National Cybersecurity Agency for the Luxembourg Economy and Municipalities, which was previously known as SECURITYMADEIN.LU, were inaugurated in October 2022.

At the same time, its previous operations were restructured. The Luxembourg House of Cybersecurity (LHC) now has a platform and facilities to promote the collaboration and cooperation of multiple Luxembourg entities. The LHC promotes an open and trusted cybersecurity data economy, destined to become the meeting place for all cybersecurity related activities, as well as the reference centre for cyber resilience in Luxembourg by capitalising and developing public and private sector expertise, collaboration, research, innovation and capabilities in the field.

With the restructuring, the LHC consolidates its activities into two centres of expertise:

- CIRCL (Computer Incident Response Centre Luxembourg), for incident management and the promotion of exchange and intelligence on the cyber threat.
- NC3 (National Cybersecurity Competence Centre), newly created by the merger of CASES and C3, articulating its work on three key pillars:
 - Supporting the development of cybersecurity capabilities and expertise
 - Foster a strong industrial base in cybersecurity
 - Contributing to excellence in research and technological development

In particular, the NC3 represents Luxembourg as the National Coordination Centre for Cybersecurity within the European network under the aegis of the European Cyber Security Competence Centre.

³³ Communiqué of 18 October 2022: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2022/10-octobre/18-fayot-sar-cybersecurite.html

Convention for the support of teaching and research activities in HPC/HPDA/AI³⁴

In September 2022, the government and the University of Luxembourg signed an agreement that provides a framework for higher education and research activities focused on High-Performance Computing, including the creation by the University of a pilot European Master's degree in High-Performance Computing, Big Data Analysis and Artificial Intelligence.

The University plans to launch a new 120 ECTS Master's degree in the Faculty of Science, Technology and Medicine, and is committed to further developing the National Competence Centre for HPC (EuroCC) and attracting world-class researchers to it. Subject to approval by the University's authorities, this new master's degree will be integrated into the first pilot HPC master's degree that is being set up at European level by a consortium of universities coordinated by the University of Luxembourg.

The planned Master's degree aims to meet the needs of Luxembourg in its digital transformation and to enable close collaboration with local industry players to develop economic and scientific activity related to the data economy.

The planned Master in HPC/HPDA/AI will be part of the EUMaster4HPC consortium, led by the University of Luxembourg and composed of 60 universities (including eight universities with graduate programmes), research centres, supercomputers, industrial partners and SMEs, as well as other contributing partners. It will support the development of HPC skills, education and basic training for European science and industry. The first courses of the European pilot Master's programme have already been offered from September 2022 at selected universities in the consortium. The first courses of the planned Master's programme at the University of Luxembourg will be offered as from September 2023.

Luxembourg Digital Innovation Hub (L-DIH)³⁵

The designation as European Digital Innovation Hub (E-DIH) extends the scope of the Luxembourg Digital Innovation Hub (L-DIH) as a single point of contact for the digital transformation of the Luxembourg industrial sector by providing additional channels and financial resources for greater impact in Luxembourg and Europe. With the national innovation agency Luxinnovation continuing to play its coordinating role, four additional partners are now joining the L-DIH consortium to significantly expand its service offering.

The new designation as E-DIH is important as it brings additional components related to the operations, structure and services of the Luxembourg Digital Innovation Hub. The E-DIH network, which comprises more than 170 E-DIH centres across Europe, is part of the Digital Europe programme, which funds E-DIHs with 50% of the total budget, with Member States or regions contributing the other half. The L-DIH consortium now includes the Luxembourg House of Cybersecurity, the Luxembourg Institute of Science and Technology (LIST), the University of Luxembourg and the Competence Centre of the University of Luxembourg. FEDIL, the Chamber of Commerce and the National Research Fund (FNR) remain strategic partners of the L-DIH to further exploit synergies.

The expansion of the consortium reflects the extension of the L-DIH's missions. During its first four years of operation, the hub has worked to inspire, inform and engage companies in the country's industrial ecosystem to facilitate their digital transformation journey. The L-DIH is now adding three more missions:

³⁴ Communiqué of 23 September 2022: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2022/09-septembre/23-meco-hpc-hpda-ai.html

³⁵ Communiqué of 23 March 2023: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2023/03-mars/23-digital-innovation-hub.html

- Supporting the development of digital skills and related training
- Helping companies "test before they invest" to encourage them to try new digital technologies and estimate their return on investment before investing.
- Helping companies to find financing and investment for their R&D and digital innovation projects.

At the initiative of the Luxembourg Digital Innovation Hub (L-DIH), a joint declaration was signed with four digital innovation hubs in the Greater Region to accelerate the deployment of digital technologies and to strengthen the innovation and technological development of businesses, particularly SMEs.

Action programme for the digital decade to 2030

The Digital Decade Action Plan guides Europe's digital transformation up to 2030, with specific targets and objectives to be implemented by Member States. The four key areas are e-skills, secure and sustainable digital infrastructure, the digital transition of enterprises and the digitalisation of public services. The programme establishes a close monitoring and cooperation mechanism between the Commission and the Member States and a new legal framework for multinational projects.

The Media, Connectivity and Digital Policy Department represents Luxembourg at European level in the Digital Decade Committee and Commission and is in charge of inter-ministerial coordination to facilitate the implementation of the programme at national level.

Digital government

The government that took office at the end of 2018 created the Ministry for Digitalisation³⁶ whose main strategic pillars are digital government, digital inclusion, administrative reform and new technologies. This ministry embodies the government's desire to place digital transformation at the heart of its initiatives.³⁷

In view of the advances brought about by the introduction of new technologies and the importance of data, the main objective of the Ministry of Digitalisation is the success of digital government. This aims to promote more participative, innovative and nimble forms of governance, with objectives that go beyond the electronic management of online public services. Today, interoperability, accessibility, security and cross-cutting aspects are at the heart of the transformation towards digital government.

Therefore, in order to strengthen and support Luxembourg in the transition to digital government, the Ministry commissioned a study on the digital government of Luxembourg, the "Digital Government Review of Luxembourg", at the OECD. The results of this study and the recommendations were presented by senior OECD representatives in Luxembourg at the launch of the High Committee for Digital Transformation in September 2022.³⁸

In order to facilitate the daily life of public administrations, citizens and businesses, the main objective of a large part of the activities of the Ministry for Digitalisation, which oversees the Government IT Centre (CTIE), is to strengthen Luxembourg's digital transformation through the digitalisation and simplification of administrative procedures in a user-friendly and secure environment.³⁹ To this end, on 5 February 2021, the Government Council approved its e-governance strategy 2021-2025, which is based on the following six principles: once only, digital by default, transparency, inclusion and accessibility, reliability and security, and interoperability/standardisation. These principles guide the public administration in its continued efforts to develop an innovative and efficient digital administration. Moreover, in February 2020, the Ministry for Digitalisation announced the

³⁶ Grand-Ducal Decree dated 5 December 2018: <http://legilux.public.lu/eli/État/adm/agd/2018/12/05/b3633/jo>

³⁷ See: <https://digital.gouvernement.lu/fr.html>

³⁸ Communiqué dated 28 September 2023: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2022/09-septembre/28-transformation-numerique-oecd.html

³⁹ Communiqué dated 24 June 2019: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2019/06-juin/24-hansen-digitale.html

establishment of digital governance in Luxembourg, with the creation of an inter-ministerial committee for digitalisation.

National Action Plan for Digital Inclusion

Another major challenge is digital inclusion. This involves making digital opportunities available to all. In this context, the Ministry for Digitalisation has set up an inter-ministerial working group to discuss the current status of initiatives underway or planned by the various ministries with a view to drawing up the first national action plan for digital inclusion for the period 2021-2025^{40,41}. In October 2021, the Minister for Digitalisation presented the National Action Plan for Digital Inclusion, which was adopted by the Government Council in September 2021. The National Action Plan for Digital Inclusion focuses on three interdependent strategic levers to achieve digital inclusion in Luxembourg, namely increasing motivation and digital confidence, facilitating access to digital technology and developing digital skills. Highlights in 2022 in the implementation of the National Action Plan for Digital Inclusion were the launch of the first call for projects related to digital inclusion, the Interdisciplinary Forum, an event featuring public and private sector participants, as well as the legal study on the feasibility of integrating a digital mandate on MyGuichet.lu.

Artificial intelligence

In May 2019, the government presented the strategic vision for artificial intelligence (AI).⁴² The government's AI strategic vision is modelled on the policy principles issued by the European Commission. In October 2019, an interdepartmental coordination committee for the AI strategy was set up by the government. At the same time, in order to promote the use of AI within the public administration, in December 2020 the government launched its second call for projects aimed at public stakeholders for experimental projects in AI and data science, named AI4Gov. The initiative foresees the development of new services in order to become more efficient and ultimately less costly and the development of new internal services or services for citizens that were previously not possible without AI.

A selection of four projects enjoyed technical and financial support in 2021 through a call for assistance from external service providers, with the aim of producing a functional prototype that can be used by internal users (government employees) or external users (general public). These projects were started in 2021 and were completed in the first quarter of 2022 with tangible, quantifiable and displayable results.

In January 2022 a new AI4GOV 2022 call was launched which resulted in three successful applications. These projects receive technical and financial support through a call for support from external service providers, with the aim of producing a functional prototype that can be used by internal users (government employees) or external users (general public) in 2023.

Within the framework of the AI4Gov committee, the Ministry for Digitalisation and its partners are leading and developing a community of state players interested in the themes of AI and data science.

In July 2022, a major event was held on the subject of AI "Natural Language Processing" applications, which attracted some fifty representatives from various administrations. Some of them presented their works, including the *Zentrum fir Lëtzebuurger Sprooch* who showcased its service www.schreiwmaschinn.lu.⁴³

⁴⁰ Communiqué of 6 October 2021: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2021/10-octobre/06-hansen-inclusion-numerique.html

⁴¹ National Action Plan for Digital Inclusion: <https://digital.gouvernement.lu/fr/publications/document-de-reference/panin-2021.html>

⁴² Communiqué of 24 May 2019 : https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2019/05-mai/24-bettel-schneider-ai.html

⁴³ See: <https://www.schreiwmaschinn.lu/>

Also, on 20 November 2020, the government implemented a key element of its strategic vision for AI by launching a public consultation on the perception of AI among the population and society stakeholders. The results of the consultation were presented in April 2021 by the Prime Minister.⁴⁴

Governance of the National Interoperability Framework (NIF)

The National Interoperability Framework (NIF)⁴⁵ aims to provide a general framework for public stakeholders covered by its scope to achieve a higher level of interoperability.

A high level of interoperability is a central and indispensable element for effective, sustainable and reliable progress on the path of digital transformation and for a modern, efficient and effective administration that identifies users, their requirements, expectations and demands as a fundamental priority.

After the 2019 approval of the National Interoperability Framework by the Government Council, the Ministry for Digitalisation introduced the governance of interoperability in the public sector at the end of 2020 to facilitate the effective implementation of the NIF principles and recommendations.

This governance sets up a National Interoperability Committee (CNI), composed of representatives of the different sectors concerned, and the seven sector-based Interoperability Committees (CSI).

The Ministry for Digitalisation has also set up a Competence Centre for Interoperability (CCIOP), a unit within the Ministry dedicated to implementing the NIF, which provides the secretariats for the CNI and the CSI of the central government and generally coordinates the activities and initiatives in implementing the National Interoperability Framework, as part of this governance.

In 2022, the CNI added new products to the national catalogue of interoperability products and approved new actions to be initiated to support the implementation of the NIF in the public sector in Luxembourg for national interoperability.^{46, 47}

In April 2022 the NIF4Gov initiative was launched for the first time to promote interoperability in the public sector through the funding of projects with a positive impact on public sector interoperability.

Public Sector Blockchain (PSBC) pilot projects

While Distributed Ledger Technology (DLT) is currently predominantly used in the financial sector, the technology can also be used for transactions outside the financial sector. Digital identification, proof of land ownership, supply chain management are just a fraction of the potential applications that will be of interest to the public sector. With this in mind, the Minister for Digitalisation announced the creation of a Public Sector Blockchain (PSBC) at the Infrachain Summit 2019. This project means that the government can develop a series of new blockchain applications for the public sector and applications involving interaction between the public and private sectors.

In 2021, the PSBC expanded its network with the addition of nodes hosted by Restena. Significant work has been done on the implementation of the pilot project for the digitalisation of student loans in the context of state financial aid for higher education, which involved collaboration between the Ministry of Digitalisation, the Ministry of Higher Education and Research and the *Banque et Caisse d'Épargne de l'État* as the pilot bank. This work culminated in November 2022 with the official launch of the pilot project to digitise and simplify the granting of student loans, with the "Smart Contracts" technical programme, rolled out on the PSBC network and the establishment of the first PSBC node in

⁴⁴ Communiqué of 28 April 2021 : https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2021/04-avril/28-bettel-consultation-publique.html

⁴⁵ Dossier on the Luxembourg Interoperability Framework: <https://digital.gouvernement.lu/fr/dossiers/2019/NIF-2019.html>

⁴⁶ IOP product catalogue of the National Interoperability Committee (CNI): <https://digital.gouvernement.lu/dam-assets/dossiers/nif/catalogue-des-produits-iop-du-cni.pdf>

⁴⁷ IOP action plan for the CNI : <https://digital.gouvernement.lu/dam-assets/dossiers/nif/Plan-d-action-du-CNI-01-00.pdf>

the private sector, in this case at *Banque et Caisse d'Epargne de l'État*. Since the launch, there has been widespread adoption of the digitised procedure for subsequent loan tranches.

Other related activities, such as the Ministry's participation in Infrachain, have resulted in a new edition of the Infrachain Challenge, which took place in September 2021. The resulting projects are being considered for future development and implementation on the PSBC.

The Ministry of Digitalisation is also involved at European level in the European Blockchain Partnership (EBP) which is setting up a European Blockchain Service Infrastructure (EBSI). This infrastructure at the European level will enable the launch of interoperable and cross-border services, such as data notarisation and a media for digital identity processes. Since 2020, the Ministry has been operating an EBSI node in collaboration with Infrachain, joining the 28 nodes already operational in various European countries.

The Ministry for Digitalisation has also established a consortium with Infrachain, the Luxembourg Institute of Science and Technology (LIST) and the Interdisciplinary Centre for Security, Reliability and Trust (SnT) of the University of Luxembourg to submit a first EBSI use case implementation project in Luxembourg under the 2020 CEF Telecom - Blockchain call for projects. This EBSILUX project, co-funded by the European Union, integrates Luxembourg into EBSI.

Luxembourg has made student mobility, multilingualism and international cooperation one of its priorities. An interoperable and cross-border solution is therefore essential.

EBSILUX has developed a solution to provide digital higher education diplomas whose authenticity can be verified automatically. Digital diplomas will allow the sharing of reliable information on the qualifications of their holders in the form of structured data rather than just unverifiable PDF documents.

The EBSILUX Designathon in May 2022 was hosted by the GovTech Lab and brought together 16 national and international participants who are working or have an interest in the EBSI project and particularly the use case diplomas project. During the event, four teams worked with the design thinking methodology to develop concepts to help educational and human resource institutions to be ready to adopt European digital diplomas, and to use these concepts to widen the accessibility and use of these digital diplomas. At the end of the event, the concepts were presented publicly to a panel of experts.

In the framework of the Blockchain Week in October 2022, organised by the Luxembourg Blockchain Lab, the project organised a Demo Day to show the public the results of the project through the demonstration of the issuance of a digital diploma for the University of Luxembourg, the authenticity of which can be verified with EBSI. The audience was able to witness the delivery of a diploma in a digital wallet, as well as the submission of a diploma to a potential employer, and the verification of the diploma by the employer.

Launch of the GovTech Lab

On 26 November 2020 the GovTech Lab was launched at a virtual press conference.⁴⁸ The GovTech Lab (GTL) allows the Ministry for Digitalisation and the CTIE to accelerate the innovation of digital public services through open innovation.

GTL has three main missions: First, it aims to accelerate innovation in the state through challenge calls and solution calls on a bi-annual basis. Secondly, the GTL aims to create a GovTech community by organising specialised events, positioning itself as the exchange platform par excellence for digital

⁴⁸ Dossier on GovTech Lab Luxembourg: <https://digital.gouvernement.lu/fr/dossiers/2021/govtechlab.html>

needs, new technologies and innovative solutions within the State. Finally, GTL intends to become the benchmark and meeting place for government officials interested in GovTech.

In order to accelerate the technological transformation of the State, the GovTech Lab has two ways of transmitting their application to economic operators to participate in projects, namely through innovation partnerships or via SpeedUP. The innovation partnership is dedicated to finding innovative technological solutions not yet existing on the market for identified specific challenges. The SpeedUP channel is intended to launch calls for projects in the framework of a legal review, conceptual analysis or even pilot projects.

In 2022, the GovTech Lab⁴⁹ launched two new innovation partnerships. In March, a videoconferencing solution that can be integrated into government sites was sought via the "Virtual Meeting Room" call for solutions. The pilot project phase of this call for solutions is underway and the finalisation of the pilot project is scheduled for the beginning of the second quarter of 2023.

In September 2022, the "Simplify Legi" call for solutions was launched with the aim of collaborating with an external partner to develop a technological solution for identifying administrative procedures and their complexity in legislative texts using artificial intelligence. One candidate was selected to advance to the pilot project phase, which started in February 2023.

Three SpeedUP efforts were launched in 2022 by the GovTech Lab:

- a legal study to set up a digital mandate
- an impact and feasibility analysis on making the web content of Luxembourg's public sector bodies available through open files
- a dynamic data visualisation solution

The official inauguration of the GovTech Lab's physical space in the CTIE building in Kalchesbruck took place on 24 March 2022. Since then, the GovTech Lab has organised a series of events based on use cases, participatory workshops, training programmes and ideathons/hackathons in its physical space in order to foster exchange between the different ministries and administrations, as well as between the public and private sectors.

Implementation of the 'Zesumme Vereinfachen' platform

In order for the digitalisation of government services to bring greater added value to users, it must go hand in hand with administrative simplification and adaptation of procedures. To achieve this goal, the Ministry for Digitalisation aims to draw on the experience of citizens to simplify procedures in a participatory manner.

To this end, since January 2022 the Ministry for Digitalisation has been offering everyone the opportunity to become directly involved in this process by providing them with a platform dedicated to participatory administrative simplification www.zesumme-vereinfachen.lu.⁵⁰

The platform allows citizens to follow ongoing projects step by step, to submit ideas or proposals for administrative simplification, or to supplement other users' proposals. They can also take part in surveys, vote for proposals and prioritise initiatives, and register for digital or face-to-face participatory workshops.

⁴⁹ See: <https://govtechlab.public.lu/fr.html>

⁵⁰ Communiqué of 15 March 2022: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2022/03-mars/15-zesumme-vereinfachen.html

Framework agreement between the Ministry for Digitalisation and the Interdisciplinary Centre for Security, Reliability and Trust (SnT)

A four-year framework agreement has been concluded between the Ministry for Digitalisation and SnT, whereby the Ministry for Digitalisation calls on SnT's expertise to promote and strengthen the digital transformation of the public administration and the digitalisation of administrative procedures in Luxembourg.

This is a new approach for the Ministry for Digitalisation whereby it benefits from access to working prototypes demonstrating that technology can solve a real challenge for the public sector as well as from knowledge transfer through access to innovative technologies.

Through this agreement, specific topics will be addressed through specific collaborative research contracts. This cooperation should contribute to and complement the work done to achieve the Ministry's objectives in terms of public sector data, interoperability, digital inclusion and GovTech solutions.

The first contract concerns the investigation of use cases for digital identities. The purpose is to explore the implications of digital identities and digital wallets from a strategic and technical point of view.

The "Digital identities for Luxembourg" project will contribute to further position Luxembourg as a digital forerunner and to shape the implementation of these identities at the European Union level. Digital identities and digital wallets have the capacity to create secure identities for citizens, so that they can effectively protect their personal data. With many possible use cases, the technology could be revolutionary in public administration, as well as in sectors such as healthcare and banking.

Development of new applications for citizens

The MyGuichet app⁵¹

In July 2021, the Delegate Minister for Digitalisation presented the new mobile application MyGuichet.lu, developed by the Government IT Centre (CTIE). This application allows citizens to access their private space in MyGuichet.lu using their smartphone or tablet. In a world increasingly oriented towards mobile solutions, this new means of accessing MyGuichet.lu is a major achievement of the commitment set out in e-Governance 2021-2025 strategy to offer citizens cross-media accessibility of digital public services, accessible on smartphones and tablets.

The CovidCheck app

The government has been making the CovidCheck.lu mobile application available since June 2021, enabling the authenticity and validity of certificates to be verified according to the rules in place in Luxembourg. This application was developed by the CTIE, the technological arm of the Ministry for Digitalisation.

The GouvID app

The new GouvID application, developed by the CTIE, offers citizens the possibility to use their electronic identity card (eID) in conjunction with their smartphone to authenticate themselves with various digital state services. This application will therefore make it possible to do without a specific eID reader.

⁵¹ Please see chapter 3.1. on the projects funded under the RRF for further information.

A prerequisite must be met in order to benefit from GouvID: citizens must have activated Luxtrust certificates on their identity card when they applied for them at their local administration or the CTIE.

The eWallet app

In 2022, the first developments for the eWallet application began. This is a national eWallet that allows users to manage, present and check digital certificates (Self Sovereign Identity principle) on their smartphones.

Modernisation of the MyGuichet.lu personal space⁵²

The CTIE teams have invested their efforts in modernising the underlying technologies of the MyGuichet.lu personal space. Users, citizens and companies, can now enjoy a web interface that is even more responsive and tailored to the new habits of Internet users.

One of the main novelties is the principle of responsive design, i.e. the interface can now be adapted to any type of device. Users can therefore connect to MyGuichet.lu from their smartphone, tablet or computer through the Internet browser and can use all the functionalities wherever and whenever they want.

In addition, great efforts have been made to make the interface accessible and the look and feel has been brought closer to the one users know from the MyGuichet.lu mobile application.

Both the responsive design interface and the mobile application are in line with the strategy of the Ministry for Digitalisation and CTIE to promote the cross-media provision and omni-channel use of public services, i.e. to allow citizens and companies to use the channel (digital or analogue) or device (smartphone, tablet or computer) that suits them best.

This project was largely carried out in 2022 and was finalised in January 2023.

Publication of the first easy-to-read description sheets on Guichet.lu

As part of the Ministry for Digitalisation's efforts in the area of digital inclusion to enable everyone to complete their administrative procedures themselves, the editors have been publishing a series of fact sheets on procedures in easy-to-read German (*Leichte Sprache*) since 2019. In 2022, this offer was supplemented by the first texts written in easy-to-read French. The first easy-to-read sheets were drawn up in close collaboration with Klaro, the official office for easy-to-read language in Luxembourg.

Easy-to-read French and *Leichte Sprache* are clear and simple languages based on short sentences. This makes them easier to understand and helps people with disabilities, dyslexia or a poor command of French or German. The Guichet.lu portal thus enables the people concerned to become more independent, because they can self-document the most essential administrative procedures in Luxembourg. This offer in easy language is an important step towards the digital inclusion of all citizens.

Electronic signature for public authorities - eSign

As a result of digitalisation, more and more documents exist only in electronic form. However, putting an electronic signature on a PDF document without an integrated solution is significantly more difficult than signing a physical letter and is complicated for two reasons:

- Limited to the use of specific products: a person wishing to sign a PDF electronically must use a LuxTrust smart card, a computer with a card reader and proprietary software. The procedure is therefore also incompatible with the use of mobile devices

⁵² Please see chapter 3.1. on the projects funded under the RRF for further information.

- Time-consuming: the sequence of steps to be taken in order to affix an electronic signature is time-consuming and not intuitive for most users

Following the health crisis, CTIE decided to offer all its government customers an IT solution that makes it easy to sign PDF documents and at the same time digitise the signature flow from a requesting party (e.g. a secretary) to a signatory (e.g. a head of administration). The eSign solution is the digital version of a standard signature pad.

This web-based solution, which was developed entirely in-house, has its advantages because it overcomes all the traditional problems and fits perfectly into the e-Government 2021-2025 strategy for two reasons:

- It facilitates the efficient transition to a paperless administration because it digitises a crucial step in the document flow process
- It can be used on a computer as well as on a tablet or mobile phone and is therefore a tool that is conducive to new ways of working and cross-media.

The Digital Workplace concept

In order to implement an IT policy based on mobility, CTIE used its move to a main site in the Neudorf-Weimershof district of Luxembourg City to introduce the Digital Workplace concept to its staff. This concept consists of equipping each agent with a laptop, a docking station, a headset and telephony software, and allowing them to work with the same equipment, whether they are in the office or working from home.

In a similar vein, multimedia equipment has been installed in the meeting rooms to allow for a seamless integration of teleworkers into the on-site work.

These efforts have been undertaken in line with the e-Governance 2021-2025 strategy, which also foresees equipping administrations with an IT environment conducive to new ways of working.

At the same time, the substitution of desktop computers with laptops has been extended to all state entities. Laptops are much more energy efficient, which helps to reduce the energy costs of office automation.

Roll-out of a data warehouse and business intelligence platform

This big data platform, which has been in place since 2018, is intended to facilitate data analytics within the public administration and to visualise it in order to regularly generate data reporting & visualization regarding a specific situation and to detect trends in a timely manner. It provides decision-makers with in-depth knowledge of their data and enables them to make strategic decisions, to simulate a priori or to evaluate a posteriori their impacts.

As the operator of its IT platform, which it makes available to the majority of ministries and administrations, CTIE has acquired extensive experience in managing the various stages of creating dashboards (collection, storage, analysis and visualisation). It makes this experience available to its clients within the framework of projects carried out for them, i.e. through its consulting activities. In view of the growing number of administrations wishing to implement their own dashboards and the increasing number of data specialists working in the administrations, in 2022 CTIE took the initiative to create a real government community. In 2022, CTIE had 31 ministries and administrations using its Business Intelligence infrastructure.

Draft law on the electronic signature of administrative documents and a secure platform for public documents

This bill introduces the possibility of providing administrative documents issued by an administrative authority with electronic signatures or stamps and of transmitting them electronically. The platform provided for in this bill will make it possible to:

- affix digital identifiers to public documents;
- electronically store originals provided with a digital identifier;
- access storage locations by means of a digital identifier for any citizen to whom the document is addressed and for any administration to which a citizen presents a copy of the document to access it.

Through its various functionalities, the bill and the platform will contribute to the digitalisation of public administration processes, facilitating the completion of administrative documents in digital format. Many internal procedures and processes that rely on a signed document can now be digitised.

Furthermore, digital inclusion will also be strengthened by the functionality of affixing a digital identifier to public documents, which will allow any citizen to access the original documents stored on the platform simply by knowing the corresponding identifier. The implementation of the platform began in October 2022.

Platform for verification and validation of electronic signatures

This platform must be able to enable state agents to verify and validate electronic signatures in accordance with the requirements of the eIDAS regulation in all European countries. Users upload the document to the platform, which validates the electronic signatures, stamps and timestamps present on the document on the basis of European trust lists and presents the results of the validation in a simplified manner. A detailed report must be available for download and the validation summary must be printable in a "print-friendly" format. The document is automatically destroyed after the validation report is issued.

With the public document platform and the draft law providing for qualified electronic signatures in administrative matters, the need for validation of signatures on electronically transmitted public documents will increase. The implementation of the platform began in September 2022.

Delivery of the Quapital IT project management method to administrations

As the main service provider for the public administration, CTIE's clients include the various ministries, the majority of administrations and many players in the public sector, and it therefore conducts a large volume of projects for these clients alongside its own projects.

These projects are all carried out according to its own project management method (Quapital IT) which is specifically adapted to IT projects. This ensures the quality of the projects by:

- applying consistent project management
- defining clear roles and responsibilities for each project
- using a shared terminology
- ensuring that projects meet their objectives and comply with constraints
- providing visibility on all projects

During 2022, the Project Management Office (PMO) set up a platform for documenting the Quapital IT method, making it available to all administrations that run IT projects independently. The objective was to ensure the quality of projects and to harmonise their management throughout the state ecosystem.

In the same spirit, in 2022 CTIE started implementing GovProject, which is intended to offer administrations all the tools they need to carry out their projects in accordance with state standards.

The aim of the solution is to enable administrations to manage all their projects, whether they are IT (using the Quapital IT method) or non-IT (using the Quapital method).

Offering cloud infrastructure and IT platforms in an 'as-a-service' format

CTIE's strategy focuses on implementing standardised platforms according to the 'as-a-service' model. This principle is based on delivering IT infrastructure, platforms or applications from a single provider to a range of customers who use them as a simple service and enjoy the benefits of not having to deal with IT management, maintenance or security. These standardised platforms enable faster deployment of IT solutions to a large number of customers and also ensure interoperability between systems and consistency of operation across administrations via the standardisation of solutions. In view of the enormous need for digitisation in public administration, CTIE is considerably expanding its range of IT solutions in the form of software as a service.

In addition to the Hive and GovProject projects, which are being deployed in the form of a 'platform-as-a-service', CTIE initiated efforts in 2022 to expand its offer on GovCloud ('infrastructure-as-a-service') by providing its customers with an additional type of data storage (S3). Offering a centralised private cloud fits perfectly with a policy of cost rationalisation as well as energy savings since administrations do not operate their own infrastructure.

Promoting the transition through public research

In terms of research, the government is pursuing its objectives by implementing an ambitious public research policy, designed to help provide answers to societal challenges, including the green and digital transition.

Thus, a new research funding programme, the National Centres of Excellence in Research (NCER), was launched in January 2023. This programme is an important element in achieving the objectives of the national research and innovation strategy⁵³ adopted by the government in December 2019. It provides a structuring framework and a funding instrument to consolidate research excellence on the basis of a mission of significant societal interest, encouraging high-level interdisciplinary research and cross-sector collaboration.

The first project, NCER-Fintech, on digital technologies for finance, was officially launched in March 2023. The second project, Clinnova, on digital health and digital resources for personalised healthcare is expected to be officially launched in April 2023. Two other NCER projects are currently being developed: one project on energy transition and one on the education of the future involving the development of new learning environments and adaptation to new challenges in the world of work.

NCER projects are funded by the National Research Fund (FNR) on the basis of an independent international evaluation for a maximum period of eight years and thus represent long-term investments in national research priorities. The maximum amount of funding for an NCER is €15 million over 5-8 years. In addition, there are variable own contributions from research institutions.

The NCER projects are part of the multi-annual agreements fixing the state allocations of the University of Luxembourg, the three public research centres LIST (Luxembourg Institute of Science and Technology), LIH (Luxembourg Institute of Health) and LISER (Luxembourg Institute of Socio-Economic Research) and the *Fonds National de la Recherche* from 2022 to 2025, signed in January 2022. The

⁵³ Communiqué of 25 February 2020: <https://gouvernement.lu/dam-assets/documents/actualites/2020/02-fevrier/25-mesr-strategie-recherche-innovation/mesr-strategie-recherche-innovation.pdf>

total state allocations to the five institutions amount to almost €1.70 billion, an increase of some 17.6% compared to the 2018-2021 multi-annual agreements. These allocations are broken down as follows:

Table 5: State allocations in the multi-annual agreements 2022-2025 (in million €)

	2022	2023	2024	2025	Total
Université du Luxembourg	220.67	223.95	228.78	234.88	908.28
LIST	52.94	53.97	55.50	57.00	219.41
LIH	44.30	44.97	45.97	47.30	182.54
LISER	14.63	15.21	15.82	16.42	62.08
FNR	69.03	70.00	75.00	80.00	294.03
Total	401.57	408.10	421.07	435.60	1,666.34
<i>Institutional bonus</i>	<i>8.5</i>	<i>8.5</i>	<i>9.0</i>	<i>9.0</i>	<i>35.0</i>

In July 2022, a National Data Exchange Platform (PNED) was created as an economic interest grouping (GIE) between the State and the Luxembourg Institute of Health (LIH) and the Luxembourg Institute of Socio-Economic Research (LISER) as founding members. The PNED will provide all the necessary services for exploiting the data value chain, thus offering public sector and research actors the opportunity to efficiently exploit all the data produced in these sectors while complying with the legal framework in force with regard to data protection. Initial priority projects will be carried out in the field of digital health and energy.

In terms of training via digital tools, the Luxembourg Media and Digital Design Centre (LMDDC) was created in December 2020 as an economic interest grouping (GIE), resulting from an initiative of the Ministry of Higher Education and Research and the Ministry of National Education, Children and Youth in collaboration with the Luxembourg Institute of Science and Technology (LIST). It offers hosting services, strategic consulting, information monitoring, pedagogical design, customised content creation, engineering services, information and training to actors or stakeholders from both the public and private sectors. It is intended to channel national efforts in terms of e-learning strategy or digital training, by presenting as many common solutions as possible to service providers.

Digital transition in the field of cultural heritage

Through its digital strategy, particularly in the field of cultural heritage, the Ministry of Culture is actively contributing to the digital transition of the sector. This strategy has been developed in collaboration with the state cultural institutes (libraries, archives, museums, etc.) in charge of collecting, documenting, preserving and promoting this heritage.

New technologies have profoundly transformed the cultural heritage professions and the COVID-19 pandemic has further accentuated this trend. Cultural heritage institutes need to strengthen and adapt their skills and expertise to cope with this transformation and to take advantage of innovative technologies such as artificial intelligence, data technologies, blockchain, 3D scanning or virtual reality. Several measures have been implemented as part of the Ministry of Culture's digital strategy for cultural heritage to address the current shortage of skilled people and the need to develop digital skills in this field, supported by a budget of €900,000 in 2022. Among the initiatives is the development of a skills network that includes digital specialists from different cultural institutes. It serves to create synergies between actors, especially through exchanges of information, the development of common frameworks, knowledge transfer and pursuing joint projects. The projects initiated within this framework are also supported by external experts, thus allowing for a consolidation and transfer of skills.

One of the strategic objectives consists, moreover, in sharing widely enriched cultural heritage data and optimising their dissemination and reuse, notably in a scientific analysis context and through the development of a semantic authority data platform operational in 2022. Other projects concern the modelling and interoperability of data, legal issues related to their publication and the implementation of artificial intelligence projects. In parallel, the Ministry of Culture is investing in the digital transformation of cultural institutes in order to standardise and optimise data lifecycle management processes and to support the development of digital skills. These initiatives are in line with the National Research and Innovation Strategy, the Luxembourg Digital Strategy and the work of the European Commission's Expert Group on a Common European Data Space for Cultural Heritage.

Reducing dependence on fossil fuels

In view of the war in Ukraine, the imminence of reducing energy dependency by reducing the import of fossil fuels is gaining momentum. This will be achieved through a reduction in primary energy consumption and domestic production of renewable energy as well as gradual decarbonisation.

On 5 August 2022 the European Council adopted a regulation on a voluntary 15% reduction in natural gas demand until 31 March 2023. The regulation provided for the Council to declare a "Union alert" on security of supply, in which it would become mandatory to reduce gas demand.

In Luxembourg in January 2023, the reduction in natural gas consumption corresponded to about 25.5% compared to the reference period between 2017 and 2022, well above the EU Member States' reduction target of 15% of natural gas demand. Consumption of electricity has also continued to fall since June 2022. In January 2023, the decrease was -9.56% compared to the reference period of 2017 to 2022.

The Ministry of Energy and Spatial Planning, together with the other relevant ministries, has introduced measures at national level to increase the security of energy supply in the Grand Duchy of Luxembourg. These measures, which aim to save energy in order to prepare the country for possible disruptions in gas supplies from Russia, have been drawn up in close consultation with all the players concerned. They involve the whole of society: the state, municipalities, citizens and businesses.

On 18 May 2022, the European Commission presented a European Action Plan for Energy Sovereignty in the EU - REPowerEU - which aims to end the EU's dependence on Russian fossil fuels on the one hand and to combat the climate crisis on the other. The negotiations focused on the strategy to be adopted, given that ending the EU's dependence on fossil fuels contributes to the fight against climate change and that an emergency energy saving plan to deal with a possible disruption in supply is essential.

The ministers stressed the need to continue to accelerate the deployment of renewable energies within the REPowerEU framework. In addition to the massive development of renewable energies, support for energy efficiency is one of the solutions for reducing energy consumption and thus moving away from dependence on Russian fossil fuels.

The various tripartite agreements signed in 2022 and at the beginning of 2023 provide, in addition to measures to curb soaring energy prices, measures to encourage and accelerate the energy and digital transition by promoting the self-consumption of photovoltaic electricity by businesses, support for long-term contracts (power purchase agreements "PPA") and additional aid to encourage the transition to renewable energy and energy renovation.

The government has drawn up a "national roadmap for the decarbonisation of manufacturing industry" and a "climate pact for businesses" to promote the green transition and reduce the economy's dependence on fossil fuels. These two measures complement the measures taken in the

areas of renewable energies, energy efficiency improvements and the adaptation of the electricity grid.

National roadmap for the decarbonisation of the manufacturing industry

As part of the gradual decarbonisation of the economy, the Ministries of the Economy, of Energy and Spatial Planning and of the Environment, Climate and Sustainable Development, are drawing up a national roadmap for the decarbonisation of the manufacturing industry in Luxembourg. This project is coordinated at the level of the High Committee for Industry / "Climate" working group.

The objectives of this roadmap are to identify and analyse decarbonisation potential in the manufacturing industry (NACE Rev. 2 Section C) by 2030 and 2050, as quantifiable today by industrial sector and by decarbonisation lever, as well as strategic measures to turn the identified decarbonisation potential into reality. The roadmap was finalised in November 2022. Regular monitoring and updating is planned for the coming years.

Climate pact for companies

The Ministry of the Economy has worked closely with the Ministry of Energy and Spatial Planning, the Ministry of the Environment, Climate and Sustainable Development, the Directorate General for the Middle Classes, *Klima-Agence* and Luxinnovation to develop the Climate Pact for Businesses initiative "*Klimapakt fir Betriber*", supporting businesses in decarbonisation and energy transition through a structured and coordinated approach facilitating the use of different initiatives, programmes, support and financial aid.

Renewable energies

National production 2021

Directive 2009/28/EC, replaced on 30 June 2021 by Directive 2018/2001/EU, requires each Member State to establish a national renewable energy action plan, the NREAP, which sets the national target for the share of energy from renewable sources consumed in electricity production, transport and heating and cooling in 2020, taking into account the effects of other energy efficiency measures on final energy consumption. The 11% target for Luxembourg in 2020, established by the 2009 directive, was reached with a share of 11.66%, thanks in particular to national progress in renewable energy production and cooperation agreements with Estonia and Lithuania.

For 2021, the course has been maintained and, according to STATEC/Eurostat figures, Luxembourg will achieve a share of 11.74% of renewable energy. For the different sectors, the share of renewable electricity has increased from 13.9% to 14.2%, that of transport remains constant, and that of heat/cold has increased from 12.7% to 12.9%. The efforts and policies undertaken throughout the period 2010 to 2020 are bearing fruit and contributing to the overall EU target.

European Union and national targets

The period 2021 to 2030 is governed by the recast of the Directive on the promotion of the use of energy from renewable sources (2018/2001/EU). In the meantime, and since the health and energy crisis, ambitions at European level have evolved and the European authorities have drawn up two plans called "Fit for 55" and "REPowerEU", so that the ambitions in terms of greenhouse gas reductions and renewable energy production have been revised upwards. Compared to the original National Energy and Climate Plan (PNEC), the share of renewables in the gross final energy consumption will be increased in Luxembourg. The details will be set out in the draft update of the PNEC to be submitted to the European Commission by summer 2023.

The indicative trajectory and the 2030 target will require increased efforts, including continued or even accelerated and targeted deployment of wind power, photovoltaic installations in the residential, industrial and tertiary sectors, and the use of heat pumps as a reference heating installation in new buildings.

Alongside national efforts, European cooperation remains an important pillar for achieving the short, medium and long-term objectives, whether through cooperation agreements with other states (Luxembourg signed such an agreement with Denmark on 3 October 2022 for the period 2021-2025) or via the EU's Renewable Energy Financing Mechanism (REFM). Luxembourg believes that the REFM instrument should become a reference instrument for the development of European cooperation and will remain at the forefront of participation in these calls for applications from the European Commission.

Renewable energy sources

In the field of electricity, the focus is on the development of wind power and photovoltaics. Progress and measures are described below. In the field of heating/cooling, heat pump technology is being promoted at an accelerated rate. In the transport sector, the focus is on electromobility, while the incorporation of biofuels is being pursued in a moderate manner.

Photovoltaics

Since the development of the photovoltaic sector stagnated in 2018, the feed-in tariffs were revised upwards and a first call for tenders for large-scale plants was launched to provide new impetus. The annual installed capacity was gradually increased in 2019 and 2020, reaching 90 MW in 2021. In 2022, a year marked by multiple crises, installed capacity was still above 32 MW and therefore higher than in 2019 and 2020. As for the regular calls for tender launched annually since 2018, a fifth call for tender was published on 3 December 2022.

In order to broaden the possibilities for the construction of large-scale photovoltaic installations, a tender with investment aid for companies was launched on 1 November 2022 with a budget of €30 million with a view, among other things, to encouraging self-consumption in companies and in industry and to cope with the soaring electricity prices. In May/June 2023, the results of the calls for tenders should be analysed, conclusions drawn and the instrument improved to make it more attractive and to give flexibility to those involved, whether they are private individuals or legal entities.

Finally, a new type of tender has been introduced. Accordingly, a pilot project was launched in October 2022, concerning the construction and operation of agricultural solar power plants. These plants make it possible to combine agricultural production with the production of renewable energy, while protecting crops against climate hazards and promoting a transition to more environmentally friendly agriculture. This technology is necessary in view of the ambitious objectives and the limited potential of surface areas on artificial structures.⁵⁴

Other measures in place include:

- The limit for the obligation to report income from a PV plant has been raised from 4 kW to 30 kW
- The reduction of the VAT rate for photovoltaic installations to 3%
- The adoption of Regulation (EU) 2022/0367 establishing a framework for accelerating the deployment of renewable energy sources, which introduces deadlines for the granting of authorisation

⁵⁴ See: <https://www.klima-agence.lu/fr/appels-doffres-un-coup-de-pouce-lenergie-solaire>

- The adaptation of the investment aid introduced by the Klimabonus in 2022 which provides for photovoltaic installations up to 30 kW:
 - Self-consumption mode: 50% of the effective costs, capped at 1,250 €/kWp, no feed-in tariff
 - Grid feed-in mode: 20% of the effective costs, capped at 500 €/kWp, guaranteed feed-in tariff
- Some measures have been taken as part of the tripartite agreement dated 28 September 2022, in particular photovoltaic installations in self-consumption mode will be eligible for a 25% supplement on the Klimabonus financial aid
- The solar registry was set up in 2020 on a public website. It assists decision making in the field of solar energy and is used to identify the likely capacities of private photovoltaic installations, companies and project developers.

Other measures are being analysed:

- An analysis is underway to try to identify concessions, or standard formulations, in the urban planning rules of municipalities, which can vary greatly from one municipality to another with very different levels of restrictions
- In the area of joint ownership buildings, a modification of the law relating to them in order to facilitate energy work, including the installation of photovoltaic power plants.

Wind power

Alongside photovoltaics, wind energy will play a key role in meeting the renewable energy targets. The current wind farm has 62 wind turbines with a total installed capacity of 166 MW (as of January 2023). Over the next few years this capacity is expected to increase, in particular due to technological progress and "repowering" offering more powerful wind turbines with higher annual production hours. The wind energy potential is mainly concentrated in the northern part of the country and is limited by the surface area of the national territory, Natura 2000 protection areas, urbanised areas or areas reserved for air radar coverage.

There are, however, possibilities that are not yet fully exploited, such as the installation of wind turbines on industrial sites or near roads. Another possibility, and not the least, concerns the granting of authorisations for wind farm projects, where various avenues are being analysed with a view to facilitating authorisation procedures, in view of the REPowerEU plan to further accelerate the deployment of renewable energies. In addition, Regulation 2022/2577, which came into force on 22 December 2022, introduced deadlines for the granting of authorisations for repowering projects.

Heat pumps

Regulatory requirements for energy efficiency in residential and commercial buildings have had a major impact on the development of heat pump systems. Aerothermal and ground source heat pumps have become the key technology for heating new buildings. This technology is in line with the objective of decarbonisation through electrification of the building sector. The requirements for energy efficiency changed on 1 January 2023. From now on, the heat pump will be used as the standard heating system when drawing up energy passes for new buildings. Heat pumps can be combined with photovoltaic systems for self-consumption of the electricity produced. For existing buildings, hybrid systems with heat pumps are a transitional solution for the gradual decarbonisation of heating with a view to complete energy renovation. The potential for heating using heat pumps in 2030 is estimated at around 1036 GWh/a.

Hydrogen

Luxembourg's hydrogen strategy was adopted on 8 July 2021 by the government in council and the document was presented to the public on 28 September 2021. This document presents the policy aspects and ambitions at different levels (national, regional, international) and the seven measures planned by the Luxembourg government to develop a renewable hydrogen market.

With the adoption of the hydrogen strategy, a steering committee of the "H2 Luxembourg taskforce" met for the first time in September 2021 and continues its consultations at regular intervals to ensure that the different measures of the strategy are implemented.

Besides the efforts at national level, Luxembourg regularly participates in international groups (Greater Region, Benelux Union, Pentilateral Energy Forum, North Seas Energy Cooperation and Hydrogen European Network), in order to put forward Luxembourg's positions in the development and regulation of a future (trans-European) hydrogen infrastructure. Under the Luxembourg initiative, the hydrogen working group within the Benelux General Secretariat has initiated a procedure to launch a study in the framework of the decarbonisation objectives of society, on the future needs for hydrogen infrastructure within the Benelux region and the interconnections with neighbouring regions.

Geothermal energy

Optimal exploitation of geothermal energy in Luxembourg will be necessary to decarbonise the heat sector in Luxembourg by 2050. To determine the potential of deep geothermal energy in Luxembourg, a study was carried out which showed a high potential, especially in the south-east and east of the country, i.e. mainly in areas with a high thermal energy need. In order to exploit this potential, several pilot projects are currently being analysed, including for example the "Neischmelz" project in Dudelange⁵⁵ and the velodrome in Mondorf-les-Bains where feasibility studies are being carried out.

Currently, the relevant ministries and administrations are working together to facilitate the authorisation procedures that could represent a major obstacle to achieving medium-depth geothermal projects.

Biofuels

In the coming years the transport sector will undergo substantial changes with the rise of electromobility.

With regard to biofuels, after having reached the target of 10% of renewable energy in the transport sector in 2020, the Ministry of Energy and Land Management has maintained the rate of biofuels to be incorporated into petrol and road diesel at 7.70% for 2021, then increased it to 8.00% in 2022. This rate remains applicable in 2023, due to market uncertainties and multiple crises (pandemic, cost escalation), and will then be aligned in the coming years with the rates in the PNEC.

Since 2020, Luxembourg has limited the incorporation of biofuels with a high risk of inducing indirect land-use change to 5% and intends to reduce this in the coming years in line with European requirements. In contrast, advanced biofuels have to be incorporated since 2022 at a level of 0.2% and the incorporation rate will have to increase in the years to come.

⁵⁵ Please see chapter 3.1. on the projects funded under the RRF for further information.

Charging infrastructure for electric mobility⁵⁶

With the aim of installing a charging infrastructure that will lead to the decarbonisation of the transport sector, the government has established a consistent framework of different measures for all actors involved.

Public infrastructure related to electric mobility

The Ministry of Energy and Spatial Planning, in collaboration with the Ministry of Mobility and Public Works and the heads of the network operators, has monitored the deployment of public charging stations, including the rapid charging stations known as "SuperChargy". As of 31 December 2022, the "Chargy" system included some 606 "Chargy" charging stations (on-street and P&R charging stations deployed, operated and managed by the network operators) and 404 "Chargy-OK" charging stations (publicly accessible charging stations funded by third parties). In addition, there are 32 "SuperChargy" charging points, which were installed at the Capellen and Berchem motorway service areas and at the "SuperChargy" station in Kirchberg, as well as 2 "SuperChargy OK" charging points. The Department of Energy also closely monitored the preparatory work for the roll-out of the remaining "Chargy" and "SuperChargy" sites.

Aid scheme for companies investing in charging infrastructure for electric vehicles

The Department of Energy of the Ministry of Energy and Spatial Planning, in collaboration with the Ministry of the Economy, has introduced a subsidy scheme to encourage companies to install private or publicly accessible charging infrastructure for electric vehicles.⁵⁷

Financial aid for the roll-out of electric mobility infrastructure

The Department of Energy, in collaboration with the Ministry of the Environment, Climate and Sustainable Development, has followed the implementation of the Grand-Ducal Regulation dated 19 August 2020 introducing financial aid for the installation of private charging stations for electric vehicles. In 2022, 1,822 application files were submitted, including 55 (or 3.01% of applications) via the digital process on MyGuichet.lu introduced in October 2022. 1,719 applications were finalised in 2022. Aid was granted for 1,573 files and 146 files had to be rejected. 173 files are still awaiting assessment. The total number of incomplete files is 353.

"Stroum beweegt - Elektresch an d'Zukunft" initiative

The Energy Department continued to contribute to the work of the "Stroum beweegt - Elektresch an d'Zukunft" initiative. Through a collective approach bringing together the various public and private players committed to electric mobility in Luxembourg, the initiative aims to support and promote the development of the electromobility market in Luxembourg and to overcome the existing obstacles.

The initiative is divided into two levels:

- Participants are awarded labels: signature of a charter, presentation of a specific measure or project, and commitment to support the development of the electromobility market
- Platform for exchange between committed stakeholders: organisation of working meetings with the aim of developing electric mobility in Luxembourg

Examples of measures and projects include the electrification of public transport, the creation of recharging facilities in residential and non-residential buildings, the implementation of a national fast-charging network for electric vehicles, targeted training and qualification of specialised personnel, regulatory adjustments or the rapid development of the vehicle market. The website

⁵⁶ Please see the section on "Promoting Sustainable Transport" for further information.

⁵⁷ Please see chapter 3.1. on the projects funded under the RRF for further information.

www.stroumbeweegt.lu⁵⁸ provides information about the initiative and the participating actors. "*Stroum beweegt - Elektresch an d'Zukunft*" is open to all other participants who also want to be awarded the label and thus contribute to achieving the objective.

The initiative organised a webinar on the bill introducing an aid scheme for companies investing in charging infrastructure for electric vehicles in January 2022 and an event in May 2022 to mark the official signing of the initiative's charter. By 31 December 2022, the initiative had 57 members.

Electricity grid

The National Energy and Climate Plan (PNEC) adopted in 2020 states that additional transmission capacity to neighbouring countries will have to be created in the medium and long term in order to continue to guarantee Luxembourg's security of supply. Due to demographic and economic developments, the electricity system will become even more important in the future. In addition, increasing digitalisation, decarbonisation of the industrial and heating sector, as well as energy efficiency measures - and the related electrification - are expected to lead to an increased load in the future. These have a particular influence on the peak load situations in the transmission grid, which are important for the design case and which, in the PNEC reference scenario, will increase from 1,150 MW in 2016 to 1,720 MW in 2040. On the generation side, the gradual development of renewable energies will lead to much higher peak injections in the future.

In addition to the findings of the PNEC, both the transmission system operator Creos and the various distribution system operators are carrying out network planning studies. These studies take into account the PNEC for the development of the overall energy system in Luxembourg and the technical characteristics of the networks. To this end, in its Scenario Report 2040, Creos analysed various possible development paths for the Luxembourg electricity system and based the detailed network planning on this analysis. In particular, Creos examined the importance of large industrial consumers as well as the load changes in function of the importance of electromobility which, according to the Scenario Report 2040, can represent a relevant increase of up to 120% of the current load, depending on the characteristics.⁵⁹

It should be noted that the utilisation rate of the existing connection to Germany during peak hours in case of a pylon failure on one of the two double lines is already around 75% to 90%, depending on the baseline scenarios. In view of the expected developments on the load and generation side, it is foreseeable that the current network capacities will not be sufficient to guarantee security of supply in the future.

According to the analysis of the biennial security of supply report drawn up and published in July 2022 in accordance with Article 11 of the amended law dated 1 August 2007 on the organisation of the electricity market, the future challenges include the fact that a large part of the current Luxembourg electricity grid dates from the 1970s and 1980s.⁶⁰ Due to the developments described since then and expected future developments, a retrofit seems appropriate. In order to assume the special responsibility of having sufficient network capacities available for dynamic load developments, based on its analyses, Creos has been planning the commissioning of a 380 kV double line to the German border between Aach and Bofferdange since 2017, as well as an extension to Bertrange, with a probable nominal transmission capacity of around 4,700 MVA in total. As the existing 220 kV double system between Quint and Trier on the German side and Blooren and Heisdorf on the Luxembourg

⁵⁸ See: <https://stroumbeweegt.lu/>

⁵⁹ Scenario Report 2040, CREOS: https://www.creos-net.lu/fileadmin/dokumente/NEWS/pdf/2020-2023/20230310_Scenario_Report_2040.pdf

⁶⁰ Bericht über die Versorgungssicherheit im Strombereich in Luxemburg: <https://mea.gouvernement.lu/dam-assets/energie/electricite/mea-vsberichtstrom2022.pdf>

side is to be removed when this link is commissioned, the transmission capacity on the German-Luxembourg border would be increased by a total of around 2,700 MVA.

In order to guarantee the security of supply in the future, even in case of unavailability of the combined 380 kV line, Creos is simultaneously reinforcing the existing lines in the northern part of the country. In this context, the conductor cables are being replaced by high-temperature low sag cables (HTLS) as part of the renewal work. This will increase the transport capacity and therefore the security of supply without the need for additional towers or corridors. The section from Roost to the German border has already been equipped with HTLS cables. The section of line on the German side should follow by the end of 2025. This would increase the transmission capacity of this link by around 480 MVA, giving a total nominal installed transmission capacity of around 1,500 MVA. Subsequently, it is planned to equip the Roost to Heisdorf (in the future Bofferdange) links with HTLS equipment as well. Creos plans to do this after 2025. Creos has planned the construction of a 380/220 kV substation in Bertrange, which will be connected to Bofferdange via the 380 kV double line.

Energy efficiency

European and national policy framework

Directive 2012/27/EU on energy efficiency and Directive 2018/2002/EU dated 11 December 2018 amending it, lay the foundations for EU energy efficiency policy. The ambitions of this policy have been revised upwards, notably through the European plans "Fit for 55" and "REPowerEU" and to a large extent following the recent international crises, forcing us to question more closely the degree of dependence on fossil fuels linked to our way of life and threatening the reliability of supply. Thus, the target of reducing final energy consumption by 32.5% at European level (overall European energy efficiency target) by 2030 is being significantly increased in the context of the revision of the energy efficiency directive expected in 2023. At the national level, Luxembourg has set a target in its PNEC that is significantly more ambitious than the EU target of 32.5%, i.e. an energy efficiency improvement target of 40-44% compared to the REF2007 reference (EU PRIMES baseline for 2030). The new EU target will be taken into account when updating the PNEC at national level.

Improving energy efficiency is one of the cornerstones of Luxembourg's energy policy and energy transition. The government continues to encourage and, where necessary, impose measures that reduce our greenhouse gas emissions and energy dependency, mainly through demand reduction, such as the energy renovation of existing buildings or the use of more effective or energy-efficient installations.

Among the most important levers of the national energy efficiency policy, the following measures should be noted.

Energy performance of buildings

The Grand-Ducal Regulation dated 23 July 2016 amending the amended Grand-Ducal Regulation dated 30 November 2007 on the energy performance of residential buildings defined the Nearly Zero Energy Building (NZEB) as a new energy performance standard required for new residential buildings as of 1 January 2017, making Luxembourg one of the forerunners in the EU to impose such a criterion. The energy efficiency of the NZEB generally corresponds to the building having the energy classes AA (energy performance class and thermal insulation class). The low primary energy requirement of the NZEB is an implicit incentive to use renewable energy. For functional buildings, the NZEB requirement for new buildings came into force in April 2019.

With the Grand-Ducal Regulation dated 9 June 2021 on the energy performance of buildings⁶¹ (RGD 2021, transposing Directives 2010/31/EU and 2018/844/EU), the Ministry of Energy and Spatial Planning has increased the requirements for energy efficiency/energy performance of buildings. These prescribe the air-water heat pump as the standard heating system from 1 January 2023, so that new construction of functional and residential buildings can no longer be equipped with a fossil boiler. In these buildings, heating and domestic hot water production will therefore be based on renewable electrical energy. The same regulation also provides for more ambitious minimum requirements for all energy renovation work on buildings.

In conjunction with the publication of the RGD 2021, training courses were offered to advise the construction sector of the regulatory changes and various technical issues and questions were addressed in a working group with the Order of Architects and Consulting Engineers (*Ordre des Architectes et des Ingénieurs-Conseils*) and the National Federation of Energy Consultants and Certification Agencies (*Fédération des conseillers et certificateurs énergétiques*).

The "PRIME House" programme and its new version "Klimabonus"

The "Klimabonus" programme is the successor to the "PRIME House" financial aid scheme and sets out the new provisions for projects initiated between 2022 and 2025 inclusive. The "Klimabonus" is a state financial aid scheme aimed at promoting sustainability, rational energy use and the use of renewable energy in the housing sector. It aims to encourage the construction of new sustainable housing, the energy renovation of existing housing and the installation of heating systems using renewable energy sources and renewable electricity production. The main objectives are to reduce the demand for heat in housing, to promote the development of renewable energy sources by making alternatives to fossil fuels more accessible, and to promote environmentally friendly construction methods and materials.

Obligation mechanism (EEOS – Energy Efficiency Obligation Scheme)

The EEOS mechanism is a cross-cutting energy efficiency measure, whose objective is to achieve energy savings for final consumers located on Luxembourg territory, through concrete energy efficiency measures. The fact that this mechanism covers all sectors and all energy carriers makes it the central pillar of the national energy efficiency policy.

The instrument entered into force on 1 January 2015. The aim was to transpose Article 7 of the Energy Efficiency Directive 2012/27/EU, which was achieved by amending the amended Law of 1 August 2007 on the organisation of the electricity market and the amended Law of 1 August 2007 on the organisation of the natural gas market, as well as by adopting the Grand-Ducal Regulation dated 7 August 2015 on the operation of the energy efficiency obligation mechanism.

The measure requires electricity and natural gas suppliers (the obligated parties), each year, to achieve savings in energy proportional to their market share in the final energy sales of the previous year to final consumers, by offering them a financial or non-financial incentive.

Directive 2018/2002/EU of the European Parliament and of the Council of 11 December 2018 amending Directive 2012/27/EU on energy efficiency, had imposed a new cumulative end-use energy savings target on Member States for the whole obligation period 2021-2030, equivalent to new annual savings of at least 0.8% of final energy consumption. Luxembourg has set itself the target of final energy savings of between 1.2% and 1.5% per year for all sectors under the PNEC for the period 2021 to 2030.

⁶¹ Grand-Ducal Regulation dated 9 June 2021: <https://legilux.public.lu/eli/etat/leg/rgd/2021/06/09/a439/jo>

In order to transpose the amending provisions at the level of the directive and to extend the mechanism until 2030, while its first period had expired on 31 December 2020, the reform work ended on 3 June 2021 with the publication of a law amending the amended law dated 1 August 2007 on the organisation of the electricity market and the amended law dated 1 August 2007 on the organisation of the natural gas market, and a Grand-Ducal Regulation (RGD EEOS) amending the amended Grand-Ducal Regulation dated 7 August 2015 on the operation of the energy efficiency obligation mechanism. A new ministerial regulation defining standardised energy saving measures and programmes, incorporating the annexes previously included in the RGD EEOS, was also published on 15 June 2021.

The most important new features introduced in the EEOS for its second period compared to the previous version are:

- a revision of the energy saving targets in line with the national targets set out in the PNEC
- the introduction of a "buy-out" option, i.e. the possibility for an obligated party to buy back some or all of its obligations, in particular with a view to enabling players with a small market share to fulfil their obligations by simply buying them out
- the introduction of discharge penalties should the targets not be met for the second period of the obligation mechanism, linked to the level of the actual cost of carrying out the measures; the results of the first period had shown that the fines for failure to meet the energy saving obligations were not sufficiently dissuasive and the law of 3 June 2021 thus creates a real dissuasive effect and a "level playing field" for all obligated parties

In order to support the obligated parties in their mission, during the economic slowdown induced by the COVID-19 pandemic, a temporary Grand-Ducal Regulation on the functioning of the compensation mechanism of the service of general economic interest (SGEI) was implemented, allowing EEOS obligated parties to be reimbursed for part of the costs incurred in fulfilling their obligations for energy saving measures for which the incentive effect took place during the period from 1 June 2020 to 31 December 2020, and which were completed by 31 December 2021.

It is important to underline that the EEOS obligation mechanism is complementary to other existing aid systems in Luxembourg, such as the state aid scheme "Klimabonus" and grants from certain municipalities for energy renovation in housing or grants from the Ministry of the Economy for energy efficiency projects in companies. An important aspect is the aggregation of these different aids as well as the awareness raising, guidance and assistance to consumers, as proposed by some obligated parties.

Voluntary agreement with Luxembourg industrial companies (period 2021 - 2023)

The current version of the voluntary agreement covers the period from 1 January 2021 to 31 December 2023.

Within the framework of the national policy for the rational use of energy, the voluntary agreement between the Luxembourg government and Luxembourg's multisector business federation representing industry (FEDIL) is an important instrument, encouraging the actors of the industrial sector to increase their energy efficiency. This agreement encourages FEDIL member companies to save energy by improving the energy efficiency of their installations and production processes. In 2021, 48 of the largest industrial companies in Luxembourg signed up to the agreement.

The energy efficiency improvement target for all member companies (general efficiency index, "*IEE général*") is 4.5% until the end of 2023, with the average of 2018 and 2019 as the reference period. Companies can choose between several options to validate the achievement of this target. Electricity produced by a photovoltaic or wind installation installed on a company's site in Luxembourg and consumed by the company itself has also been taken into account.

The report on the voluntary agreement for the year 2021, drawn up by the *Klima-Agence* in cooperation with FEDIL, indicating the progress made in their commitments and the fulfilment of the annual tasks of the member companies, reveals that the progress in terms of the evolution of the energy efficiency index of all the member parties for 2021 was very positive compared to the indicative trajectory.

Energy audits

Based on article 8 of the EU Energy Efficiency Directive (EED) 2012/27, an obligation to perform an energy audit every 4 years has been introduced for large (non-SME) companies as of 2015. The idea of this obligation is to make companies aware of energy saving potentials, identifying specific potentials for improving energy efficiency in the company.

Companies are encouraged to implement the identified measures, provided that they are cost-effective, with the support of the "energy efficiency" grant offered by the Ministry of the Economy within the framework of environmental protection investment aid and, if necessary, by financial and non-financial incentives offered by the obligated parties within the framework of the energy efficiency obligation mechanism. The first deadline for carrying out such an audit was 10 December 2016.

The obligation to carry out an energy audit for companies meeting certain criteria will be revised on the basis of the revision of the EED planned for 2023. The eligibility criterion will no longer be the classification of the company based on its size (SME or non-SME), but the level of annual energy consumption. If the level exceeds 10 TJ (= 2.78 GWh) an audit will be required and if it exceeds 100 TJ (final figure still under discussion in the EED review) an energy management system will be required. EPCs (Energy Performance Contracting) will be taken into consideration. An obligation to implement the measures identified in the energy audit will be introduced, depending on the break-even point. The content of the energy audit will be revised to include the identification of the company's decarbonisation potential, in addition to the energy aspects (energy efficiency and potential for self-consumption of photovoltaic electricity). In addition to this obligation, SMEs and, in general, all companies not obliged to carry out a statutory audit, will be encouraged to carry out energy audits, particularly as part of the new climate pact for companies (*Klimapakt fir Betriber*).

Project for decarbonisation of industrial processes on the basis of the temporary crisis and transition framework

In addition to the investment aid provided for in the future European framework, it was suggested that operating aid linked to Contracts for Difference (CfD) and Carbon Contracts for Difference (CCfD) should be introduced. Such aid makes it possible to bridge the profitability gap between a more profitable carbon project and a decarbonised project by setting a reference price based, for example, on changes in the carbon price. This measure is part of the efforts to support companies in their decarbonisation projects.

Support for municipalities in the field of renewable energy

Climate Pact 2.0

The Climate Pact 2.0 is the successor to the first climate pact with municipalities. It is a contract between the Ministry of the Environment, Climate and Sustainable Development and the municipalities. Three specific areas of the Climate Pact were developed in a more focused manner during the second phase: better quantification of the results achieved, continuous improvement of the operational framework of the municipalities and strengthening of citizen participation.

Through the Climate Pact, the State offers municipalities a legislative, technical and financial reference framework to guide them effectively towards a sustainable policy and facilitate their targeted

intervention in the fight against climate change. Municipalities are thus encouraged to strengthen their exemplary role in climate and energy transition policy, to reduce their emissions of greenhouse gases and other atmospheric pollutants, to contribute to efforts to adapt to climate change, to promote resource efficiency and the principles of the circular economy, to contribute to a sustainable mobility policy and thus to stimulate sustainable local and regional investments. Through a catalogue of 64 measures established by the European Energy Award (EEA), which have been met in full, in part or not at all, municipalities obtain a "certification" which, depending on its level, allows them to benefit from the assistance of a climate advisor as well as from subsidies from the State. The Climate Pact grants four levels of certification and has been signed by all municipalities in the country. The governance of the Climate Pact 2.0 has been strengthened internally, in particular by entrusting the monitoring of the EEA measures during the implementation of the general policy of the municipality directly to a member of the college of mayors and aldermen.

"Klimabonus Wunnen"

Since 2022, the "Klimabonus Wunnen" aid scheme has been increasing financial support for the construction of sustainable housing, the sustainable renovation of housing, the installation of technical facilities for renewable energy sources in housing and energy advice. The current scheme covers projects initiated between 2022 and 2025.

The main changes compared to the previous scheme are a simplified procedure for accessing grants, increased promotion of environmentally friendly insulation materials, further incentives to replace old fossil fuel boilers, eligibility of air-water and air-water hybrid heat pumps in existing buildings and the promotion of self-consumption for photovoltaic installations with a higher subsidy and the inclusion of a battery in the eligible costs. In detail, the changes concern the following points:

Energy retrofitting:

- Increased subsidies for energy measures and consulting
- Increased emphasis on environmentally friendly materials
- Administrative simplification
- Introduction of the possibility of implementing individual measures without the need for full energy consultations

Technical installations (renewable energies):

- Increase in subsidies
- Additional bonus for the replacement of an existing fossil fuel boiler
- New additional bonus and premium for the installation of a heat pump in an existing building
- Increase in the premium for photovoltaic installations and eligibility of a storage battery in self-consumption mode
- Additional premium for the installation of a particle filter for wood burning heating systems.

It should be noted that energy suppliers and some municipalities also offer additional support in connection with the "Klimabonus Wunnen" scheme. The Klima Agency's subsidy simulator groups all these subsidies together and provides an overview of each measure in this context.

Support measures of the "*Klima-Agence*"⁶²

The *Klima-Agence*, formerly known as "myenergy"⁶³, is responsible for communication, awareness-raising and consultations on the topics of climate protection and energy transition. It offers a range of support measures in these areas for municipalities, companies and private individuals.

With the Climate Act dated 15 December 2020, which amends the amended Act dated 31 May 1999 on the establishment of an environmental protection fund, municipal administrations, associations of municipalities and public establishments under the supervision of municipalities can receive investment aid for projects relating to energy efficiency and the promotion of new and renewable energy sources. These grants will be available to all municipalities, regardless of their commitment to the Climate Pact. Application can be made for aid in the field of energy efficiency as well as in the field of renewable energy.

In addition, the *Klima-Agence* offers municipalities the "*EnerCoach*" software. This is an easy-to-use and efficient energy accounting software that acts as a dashboard and control centre: this tool can be used to efficiently record, illustrate and analyse energy (heat and electricity) and water consumption, as well as CO₂ emissions of functional buildings and municipal equipment (public lighting and vehicles). This software is available free of charge to municipalities that request it.

In addition, the *Klima-Agence* offers municipalities the "*Klima-Agence Infopoint*". This is a cooperation service offered by *Klima-Agence* to municipalities that wish to raise awareness and help their residents to limit the energy consumption of their homes, to discover the potential of renewable energies and to obtain information on sustainable construction.

Promotion of sustainable transport

Because of the environmental, social and economic impact, mobility remains a government priority. Efficient and sustainable mobility is not only essential for Luxembourg's economy, but is also essential for the reduction of greenhouse gas emissions by 2030 and beyond, as well as for the quality of life for all those who live and work in Luxembourg.

Global strategy for sustainable mobility

In the field of mobility, the government is aiming for a true paradigm shift through the implementation of the actions and projects proposed by the Global Strategy for Sustainable Mobility (MoDu 2.0)⁶⁴ and the PNM 2035.⁶⁵

The innovative PNM 2035 - National Mobility Plan offers a comprehensive concept capable of handling 40% more travel than in 2017. It implements the approaches advocated by the sustainable mobility strategy Modu 2.0, namely:

- moving from a catch-up approach to one that anticipates future mobility demand
- to first determine the number of people who will need to travel to a given location and then to strengthen the modes of transport best suited to the context
- to mobilise the four mobility actors, i.e. the State, the municipalities, the employers and the citizens

The ongoing work to extend the tram network in Luxembourg City is emblematic of this change. The PNM 2035 aspires to the development of public transport and more attractive infrastructures for so-called active mobility. This strategy is supported by the "Transport Sector Plan" (PST). In addition, the

⁶² See: <https://www.klima-agence.lu/fr>

⁶³ Communiqué of 15 March 2022: <https://www.klima-agence.lu/fr/myenergy-devient-klima-agence>

⁶⁴ Sustainable Mobility Strategy "Modu 2.0" (brochure): <https://transports.public.lu/dam-assets/publications/contexte/strategie/modu2-fr-brochure.pdf>

⁶⁵ See: <https://transports.public.lu/fr/contexte/strategie/pnm-2035.html>

promotion of the development of electric mobility is encouraged, as well as the introduction of a green mobility label for companies.

Public transport

As planned in the government programme⁶⁶, free travel on trains, trams and buses has been in place nationwide since 1 March 2020. The fares for cross-border transport were reduced after consultation with the neighbouring networks SNCB, DB, SNCF. On the RGTR network, the "RegioZone" fares have also been reduced. This means that not only residents but also cross-border commuters benefit from the measure.

In addition, the government plans ambitious investments in railway infrastructure between 2023 and 2026 amounting to €1.23 billion. In addition, the CFL (*Société Nationale des Chemins de Fer Luxembourgeois*) has concluded the largest rolling stock purchase contract in its history amounting to €360 million, which will be delivered during the period 2023-2025. Investments in the tram amount to €301 million over the period 2022-2026.

At the same time, the reform of the national bus network RGTR was finalised in 2022. The objectives of the reorganisation of the RGTR network are to prioritise and optimise regional bus routes, to improve services on Sundays and public holidays and to improve evening frequencies. In addition, the government is pursuing its "No-emissions by 2030" objective by introducing electric buses on the national RGTR bus network. As far as urban buses are concerned, the City of Luxembourg, with 40% co-financing from the European Regional Development Fund (FEDER), has acquired 10 buses that are 100% electric.

In order to further promote the use of public transport by making mobility more pleasant, efficient and economical, the government has introduced a near-real-time telematics information system for public transport.

Fuels

In the interests of reducing greenhouse gas emissions and protecting the climate, and following an initial increase in excise duty on road fuel in May 2019, the government introduced a CO₂ tax on fossil fuels at the beginning of 2021, amounting to €20 per tonne of CO₂. The budgetary revenues from this increase in excise duty are earmarked for measures to support the energy transition and measures to promote social equity. This tax was increased to €25 on 1 January 2022 and then to €30 per tonne of CO₂ on 1 January 2023.

After achieving the 10% target for renewable energy in the transport sector in 2020, the Ministry of Energy and Spatial Planning has maintained the rate of biofuels to be incorporated into petrol and road diesel at 7.70% for 2021.

The minimum rate for 2021 for so-called "double-counting" biofuels, biofuels that do not compete with the food chain, was 50% (after application of the double-counting rule).

For 2022, the biofuel incorporation rate is increased from 7.70% to 8.00%, not only in order to gradually increase the share of renewable energy in the transport sector but also to align with the objectives set out in the National Energy and Climate Plan (PNEC).⁶⁷ This rate remains applicable in 2023, due to uncertainties on the markets and multiple crises (pandemic, soaring costs), and will then move in the coming years to the rates included in the PNEC.

⁶⁶ Coalition Agreement 2018-2023: <https://gouvernement.lu/dam-assets/documents/actualites/2018/12-decembre/Accord-de-coalition-2018-2023.pdf>

⁶⁷ Integrated National Energy and Climate Plan: <https://environnement.public.lu/content/dam/environnement/actualites/2020/05/Plan-national-integre-en-matiere-d-energie-et-de-climat-du-Luxembourg-2021-2030-version-definitive-traduction-de-courtoisie.pdf>

Electromobility⁶⁸

In order to encourage the purchase of electric vehicles, the government has decided to increase the purchase subsidies for 100% electric cars and vans. Accordingly, premiums of up to €8,000 are granted for 100% electric cars ordered between 11 May 2020 and 31 March 2024. Purchase premiums for plug-in hybrids have been discontinued. Similarly, the government is encouraging the purchase of 100% electric quadricycles, motorbikes and mopeds. This applied to vehicles ordered, bicycles and pedelecs purchased between 11 May 2020 and 31 March 2024.

By the end of 2022, 1,044 charging points in the "Chargy" network were operational across the country, including 32 "SuperChargy" fast charging points. As the majority of these charging points have two charging points, this is equivalent to approximately 2,000 parking spaces equipped with a charging infrastructure.

By the end of 2023, 88 "SuperChargy" ultra-fast charging stations with a charging capacity of between 150kW and 350kW will be distributed throughout 19 stations. The test phase was launched in January 2021 with the inauguration of a "SuperChargy" station in Kirchberg, followed by the commissioning of the P+R station in Junglinster and the first 350kW charging stations. On 4 July 2022, the first "SuperChargy" public ultra-fast charging stations were inaugurated on the Luxembourg motorway network (in the Capellen and Berchem rest areas).

In addition to establishing a network of public "Chargy" charging stations and fast charging stations, on 21 August 2020 the government introduced a new subsidy scheme for installing private charging stations, which, like all households in the Grand Duchy, are powered by green electricity. Luxembourg is now promoting the establishment of a dense and practical network of charging solutions and is becoming one of the forerunners in Europe. The amount allocated is between €750 and €1,650 depending on the type of installation and may not exceed 50% of the purchase price (excluding VAT).

In order to complement the network of "Chargy" charging stations, on 6 December 2021 the government tabled a bill to set up an aid scheme aimed at encouraging companies to deploy charging infrastructures both accessible to the public and for their internal needs.⁶⁹

A first public hydrogen station in Luxembourg will be put into service in 2023. This first station in the Grand Duchy of Luxembourg will supply hydrogen to light vehicles, commercial vehicles and heavy goods vehicles and will be created in the ZAE Wolser A in Bettembourg, at the secure transport centre of the CFL's Eurohub South, as part of the European "H2Benelux" project.

Interdepartmental working group on intelligent mobility

The Ministry of the Economy continues to support the development of the intelligent mobility sector and the automotive industry by supporting companies in their development efforts and by encouraging the growth of an ecosystem favourable to sustainable economic activities in this field. As part of its coordination efforts, the Ministry of the Economy leads the inter-ministry working group "Intelligent Mobility", composed of key players in mobility in Luxembourg representing the private sector, the public sector and public research. The main tasks of this group are the promotion of RDI activities, the attraction, implementation and coordination of sustainable mobility projects, the linking of different stakeholders, and the identification of synergies between actors and projects.

In addition, the Ministry of the Economy:

- Continues its commitment to the "France-Germany-Luxembourg Digital Experimental Site" for cooperative, connected and automated driving, an initiative that is being implemented jointly

⁶⁸ Please also see the section on "Renewable Energy" for further information

⁶⁹ Please see chapter 3.1. on the projects funded under the RRF for more details.

with the Ministry of Mobility and Public Works. A study aimed at assessing Luxembourg's suitability in terms of governance, infrastructure, authorisation procedure and accessibility to mobility data in order to encourage the development of cooperative, connected and autonomous mobility has been carried out and will be used to draw up a scope of measures conducive to reinforcing Luxembourg's strengths in this area.

- Participated in the "Data for Road Safety" collaboration effort. A public-private partnership between nine EU Member States, several key industry representatives and under the observation of the European Commission, this new ecosystem formalises the general conditions and determines the technical framework for accessing, processing and making available road safety data from both connected vehicles, smart infrastructure and other sources of interest.
- Represents Luxembourg on the Board of directors of the independent international body Euro NCAP, whose main function is to test the passive and active safety capabilities of new motor vehicles. The Ministry of the Economy contributed to the development of the new roadmap "Vision 2030: a safer future for mobility" which foresees the introduction of new test points including the evaluation of assisted and automated driving systems, the monitoring of driver vigilance, connected safety functions, the fire risk of an electric vehicle and the promotion of best practices in the field of (cyber) security and access to vehicle data.
- Is actively contributing to the process resulting from the Rome agreement on connected and automated driving. In order to provide a better framework for research and development, the Ministry of the Economy has joined the group of Member State representatives of the CCAM Partnership, a new European partnership under the Horizon Europe programme, with the objective of accelerating the implementation of innovative, connected, cooperative and automated mobility technologies and services.
- Participates at EU level in the meetings of the Intelligent Transport Systems Committee with the objective of enabling their roll-out in the road transport domain and facilitating the creation of interfaces with other sectors.

New financial support for companies to acquire zero-emission heavy-duty vehicles⁷⁰

In view of the tripartite agreement of 31 March 2022 to strengthen Luxembourg's commitment to combat climate change, a new aid scheme has just been introduced for companies wishing to convert their road haulage vehicle fleet to "zero emission" CO₂ rolling vehicles. This aid is introduced on the basis of the amended Act dated 15 December 2017 on the environmental aid scheme.

The new subsidy is based on an analysis of the most suitable propulsion technologies to stimulate the decarbonisation of the logistics sector in Luxembourg as well as on the price difference between these new technologies compared to an equivalent internal combustion engine vehicle. The objective is to further encourage companies to invest in zero-emission technologies in order to reduce the environmental impact of their road freight transport activities. This aid is temporary and will be reviewed in the context of the transposition into national law of the new EU state aid rules.

Prospecting strategy for decarbonised and sustainable mobility

The Ministry of Economy, in collaboration with Luxinnovation and the network of Luxembourg Trade and Investment Offices (LTIO), is developing and implementing a business development strategy focusing on technologies related to low-carbon, sustainable and shared mobility, as well as cooperative, connected and autonomous driving. The Ministry of the Economy has also proactively contributed to Luxembourg's promotion efforts through targeted visits of key players and public

⁷⁰ Communiqué of 18 April 2023: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2023/04-avril/18-aide-entreprises.html

presentations of the assets and major initiatives related to this field at specialised events both at European and international level.

Cohesion policy programming 2021-2027

Some of the European Structural Funds are briefly described below. For more information on the use of the FEDER, REACT-EU, ESF Plus and JTF Structural Funds, please see the chapter "Use of Structural Funds, Funding Priorities for the period 2021-2027", section 5.3 of this NRP.

The FEDER Operational Programme 2021-2027

For the 2021-2027 programming period, inter-institutional negotiations have continued and the FEDER Managing Authority has agreed with the European Commission on the continuation of the investment policy and strategy: the focus will continue to be on research and innovation and on a sustainable and resilient economy. Accordingly, on 16 December 2022 the European Commission formally adopted its 2021-2027 programme.

The REACT-EU Programme

Alongside the 2014-2020 programming period, the FEDER Managing Authority is in charge of implementing the REACT-EU programme up until 2023. On 23 December 2020, the Council and the European Parliament adopted the proposal for a regulation on REACT-EU (Supporting Recovery in Europe's Cohesion and Territories). This initiative extends and complements the crisis response measures implemented under CRII and CRII+. REACT-EU has granted a financial allocation for the years 2021 to 2023 of €139.8 million to Luxembourg and is managed by the European Regional Development Fund (FEDER), the European Social Fund (ESF), and the Fund for European Aid to the Most Deprived (FEAD). The funds allocated to Luxembourg under REACT-EU will be used to co-finance the short-time working scheme, the costs related to the vaccination against COVID-19 and the green transition initiatives.

The European Social Fund plus (ESF plus)

In order to simplify the implementation of ESF Plus, the European Commission has brought together different funds and programmes. These are the European Social Fund (ESF), the Youth Employment Initiative (YEI), the European Fund for Assistance to the Most Deprived (FEAD) and the Employment and Social Innovation Programme (EaSI). In the Grand Duchy, the ESF Plus finances a multitude of projects in the fields of social entrepreneurship, training or socio-professional integration for the most vulnerable. The aim is to achieve high levels of employment, fair social protection and a skilled workforce ready for the transition to a green and digital economy. Improving employment opportunities, strengthening social inclusion and combating poverty, promoting education, skills acquisition and lifelong learning, and strengthening administrative capacity are all themes supported by the European Social Fund (ESF).

The Just Transition Fund: Building territorial resilience in an equitable way

The Just Transition Fund (JTF), which is one of the pillars of the Just Transition Facility, is a new financial instrument under the cohesion policy. Its main objective is to support the territories most affected by the negative effects of the transition to climate neutrality. In Luxembourg, the JTF will be implemented through the FEDER and ESF Plus programmes, which each have a priority axis dedicated to the JTF. The objectives as well as the territory and types of eligible operations are defined by the Just Transition Territorial Plan (JTTP) which was approved as an annex to the FEDER and ESF Plus operational programmes in December 2022.

Promotion of equality in the education system

The government is continuing its work on modernising the school system and developing the range of education on offer, while acknowledging the heterogeneity of our society and pursuing the overarching goal of giving everyone the best possible chance of success.

The future 2025 curriculum will focus on specific 21st century subjects such as digital skills and interdisciplinary themes such as the environment, sustainable development, living together in a multicultural society, the media, critical thinking and creativity. The 2025 curriculum will be the result of a consultative process involving all key stakeholders.

The modernisation of the school system also relies on the regular updating of the core school books. For French, the new material was ready for the start of the school year 2022-2023, for mathematics and German, the redesign of the books is in the conceptual phase.

New sections in Secondary Education have been introduced. In 2017, Section I - Computer Science and Communication, was introduced in four high schools in the country. At the beginning of the 2022-23 academic year Section N - Entrepreneurship, Finance, Marketing section was added, followed in the following year by Section P - Psychology, Pedagogy and Humanities.

A digital science course was introduced in 18 high schools as pilot programmes at the start of the 2021-2022 academic year in the general and classical 7th grades. From the beginning of the school year 2022-2023, the course was offered in all 7th grades, while the pilot phase continued in the 6th grades of the pioneer high schools. By 2024-2025, all classes of 7th, 6th and 5th grade will be offered a digital science course.

In general secondary education, students will be able to opt for an introductory course in English as part of the General Culture branch (CULGE) from the 6th grade onwards.

Initial vocational training is continuing to modernise, digitise and adapt to the ecological transition by updating or even redesigning the curricula. Also of note is the creation of the DAP Education - socio-pedagogical officer.

A sixth European public school opened its doors in September 2022 in Luxembourg City. It has 139 primary pupils and 174 secondary pupils, divided into three language sections - French, German and English. In the south of the country, the first school to offer the French-speaking international section of the International Baccalaureate (IB) will supplement the Lycée technique du Centre in Luxembourg City.

Guidance

The menschoul.lu guidance website has been enhanced with a simulator enabling pupils to find out the promotion criteria for the path they are thinking of following after a fifth year of general secondary education or a fourth year of classical secondary education.

A second school fair will be held in June 2023. Young people, together with their families or teachers, are given information on the educational offer. They can also participate in an apprenticeship contract marketplace.

Literacy in French

A pilot project in four basic schools enabling pupils to learn to read and write in French has been launched. For pupils literate in French, the roles of French and German are reversed in comparison to pupils literate in German: French is the primary written and spoken language, oral German learning

begins in cycle 2 and written German learning is introduced in cycle 3.1. It is possible to offer both languages in the same class, separating pupils only for language-related lessons.

Homework support

A free homework help scheme is offered in all educational and care facilities (childcare centres and parental assistants) with the multiple aim of assisting children, relieving the burden on families and networking partners. The measure is aimed primarily at children who do not have access to adequate resources to do their homework in peace at home or for whom the language barrier prevents the parents from helping them. These circumstances should not put them at a disadvantage in their school career. A digital class diary (*e-Bichelchen*) makes it easier for parents, teachers and educators to exchange information about a child's homework.

The government plans to raise the compulsory school attendance age from 16 to 18. More than a third of school dropouts are between 16 and 18 years old. Delaying school leaving will contribute to the prevention of dropping out of school and to future integration into the labour market. There are plans to develop alternative schooling structures. In order to allow time for these structures to develop, mandatory school attendance until the age of 18 will not come into force until three years after the publication of the law.

Alternative learning centres for young people in difficulty

A pilot project involving the Ministry, secondary schools and socio-professional integration centres (CISP) aims to create alternative learning centres. These centres are intended to enable young people in difficulty or who have dropped out of school to obtain official certification of the skills they have acquired, even though they have not yet obtained the final diploma. The training programmes in the CISPs should be based on the regular curricula and the CISP's partner school should carry out the assessment. Through partial certification, the young person re-entering a training course can be exempted from participation in the corresponding courses, thus freeing up time to readjust to school. Those who do not feel ready to return to school can nevertheless demonstrate to a potential employer the skills they have acquired during their time in the CISP. Partial certification is also part of the much-needed recognition of these young people whose paths have been hindered.

New law for integrating newly arrived students (Draft Bill No. 8069)

The procedures for integrating and guiding foreign pupils are being systematically improved. A School Integration and Reception Service (SIA), with its own legal basis, will soon be created. The SIA will provide holistic care for newly arrived students: all their skills will be taken into account in their orientation process, as well as their aspirations and the family's life project. This restructuring of the system for integrating newly arrived students will help to reduce the impact of social or cultural background on school performance and to enhance the personal background of the students.

Well-being, support and assistance

In order to take better account of the link between performance and the well-being of pupils, the forthcoming amending law on the organisation of secondary schools enshrines the central importance of the concept of protecting students. It provides for an article devoted to proper treatment in an educational environment. The psycho-social and school support department of each secondary school will act as a service for the protection of the rights of students who are victims of (cyber) harassment or any other toxic behaviour: it will support them in asserting their rights and will document situations of abuse. Support and guidance for pupils will be strengthened by the creation of an educational and psycho-social department in each high school, which will combine the psycho-social and school

support service, the socio-educational service, the support team for children with special needs, the school guidance and integration unit and, where appropriate, the boarding facility.

The Centre for Psychosocial and School Support (CePAS) has developed a child-friendly system. This system for prevention allows students to easily and safely disclose violence that they may have experienced or witnessed.

Investments in education and student care

Non-formal education makes a significant contribution to awakening and stimulating the potential of every child. It is an essential part of a child's development and must be accessible without financial barriers.

From the beginning of the school year 2022/2023, childcare in non-formal education facilities and with parental assistants is now free of charge during school weeks, from 7 a.m. to 7 p.m., for children enrolled in primary education (as of compulsory school age). During holiday weeks and outside these hours, the childcare-service voucher (CSA) scale applies. During school weeks, lunch is also free for all children in primary education.

Arts and culture are also particularly important resources in this process. Children should be able to enjoy access to all these opportunities regardless of family income. From 2022/2023, a large proportion of music courses will be free of charge in order to make them accessible to all children and young people.

Combating aggressive tax planning

Measures to combat aggressive tax planning

Luxembourg has long been committed to the fight against tax evasion and avoidance. For several years, Luxembourg has been regularly strengthening its tax legislative framework with far-reaching measures aimed at countering aggressive tax planning.

In particular, Luxembourg has a framework for the effective exchange of tax information which guarantees administrative cooperation between tax authorities at European and international level and which makes it possible to effectively combat tax fraud and evasion.⁷¹ This framework is the result of the transposition of several administrative cooperation directives (DAC 1, 2, 3, 4 and 5) which incorporate globally accepted standards of tax transparency. The DAC 6 directive allowing the automatic exchange of information on certain cross-border aggressive tax planning schemes applies in Luxembourg law. By its deterrent and preventive effect, the reporting of information on aggressive tax planning schemes is likely to contribute effectively to efforts to create a fairer tax environment. The DAC 7 directive provides, in addition to certain clarifications regarding administrative cooperation in general, reporting obligations for sellers in the sharing and on-demand economies. The DAC 7 directive is applicable from 1 January 2023 and will complement this tax information exchange framework.

Luxembourg has actively participated in drafting the directive aimed at implementing at EU level Pillar 2 of the comprehensive agreement on the reform of international tax rules drawn up under the auspices of the OECD. The Directive to ensure a worldwide minimum level of taxation for multinational groups in the EU (the "Pillar 2 Directive") contains mechanisms to ensure that multinational enterprises pay their fair share of taxes in the countries in which they operate. The Pillar 2 Directive,

⁷¹ Dossier on Tax Transparency and Combating Aggressive Tax Planning: <https://gouvernement.lu/fr/dossiers/2018/transparence-fiscale.html#bloub-7>

which will be applicable from 31 December 2023, provides an additional effective measure to combat aggressive tax planning.

The transposition during 2018 and 2019 of the ATAD 1 and ATAD 2 directives containing anti-avoidance provisions has involved the introduction and strengthening of certain mechanisms to combat aggressive tax planning in Luxembourg law. In this context, it is worth mentioning the substantial reinforcement of the anti-hybrid rules which aim at counteracting the effects of tax schemes that take advantage of subtleties or inconsistencies between two or more tax systems.

In addition, the Multilateral Convention on the Implementation of Tax Treaty Measures to Prevent BEPS ("Multilateral Instrument" or "ML") was ratified in 2019 by Luxembourg. By introducing a number of minimum standards in the double tax treaties concluded by Luxembourg, especially the "Principal Purpose Test" rule, the Multilateral Instrument specifically strengthens the Luxembourg legal framework in the context of the fight against aggressive tax planning structures using treaty shopping.

In recent years, in addition to the measures mentioned above, Luxembourg has also adapted certain provisions of Luxembourg tax law in order to counteract certain undesirable behaviour. More specifically, in 2018, adjustments were made to two legislative provisions whose interpretation by taxpayers could have led to the implementation of tax base erosion and profit shifting practices, or even to the non-taxation of certain income. Both amendments contribute to strengthening the level of protection against aggressive tax planning within the Internal Market. These two measures result both in Luxembourg requiring a taxpayer to prove that another state also recognises a permanent establishment before granting an exemption on the basis of the applicable double tax treaty, and the elimination of the tax-free exchange or conversion of a convertible bond in favour of stakes or shares⁷² (paragraph 16(5) of the Tax Adaptation Law and article 22bis L.I.R.).

Moreover, with the objective of combating certain tax planning structures, since 1 January 2019 Luxembourg has applied enhanced control mechanisms on the basis of an administrative circular vis-à-vis jurisdictions included on the list of non-cooperative jurisdictions of the Code of Conduct (business taxation) (7 May 2018, L.G. - A n°64).

Measures on outbound payments

A detailed overview of the measures implemented regarding outbound payments can be found in Chapter 3.1 of this NRP, section "Promoting a transparent and fair economy".

Access to housing

The roll-out of the National Affordable Housing Strategy⁷³

In keeping with the overriding objective of ensuring that everyone in Luxembourg can live in dignity and to achieve a right to housing for all, the Ministry of Housing, together with the players in the sector, is implementing the "National Strategy for Affordable Housing". This strategy is based on two main points:

- a massive increase in public, affordable and sustainable housing;
- more protection for individuals and better regulation of the private market.

The rise in interest rates since 2022, which has led to a sharp drop in real estate transactions in the 4th quarter of 2022, confirms the relevance of these public action priorities. Accordingly, a series of reforms have been launched and new instruments and measures have been put in place.

⁷² Law dated 21 December 2018 : <https://legilux.public.lu/eli/etat/leg/loi/2018/12/21/a1164/1o>

⁷³ See: www.strategie logement.lu

A substantial investment in affordable, public and sustainable housing

Between 2020 and 2022, five laws have been passed in the Chamber of Deputies to finance large-scale projects. These will provide almost €1 billion for the construction of more than 3,500 affordable housing units in the long term.

- Kehlen (Elmen 1), Dudelange (Neischmelz), Wiltz (Wunne mat der Woltz), Mamer (Wéltgebond), Biver (An der Schmëtt)

Financing bills are being drawn up and will be submitted before the summer of 2023 for five other large-scale projects involving the creation of 1,000 additional dwellings.

- Cité militaire (Diekirch), Elmen 2, Itzgerknupp, JFK Sud, Val St André

Under the Housing Pact 2.0 (*Pacte Logement 2.0*),⁷⁴ municipalities are supported and empowered to do their part in this national effort; they have a performance obligation. The monitoring of the *Pacte Logement 1.0*,⁷⁵ carried out by LISER for the *Observatoire de l'habitat*, revealed that 5,200 affordable housing units should have been created between 2008 and 2018. However, due to the lack of binding measures and monitoring instruments, there is currently no way to verify how many of these dwellings are actually affordable housing.

The *Pacte Logement 2.0* focuses on the actual creation of affordable housing. In total, 99 municipalities have signed an initial agreement with the Ministry of Housing, including 49 municipalities that have already drafted their Local Housing Action Programme (LHAP) in conjunction with their Housing Advisor provided by the Ministry of Housing.

According to the Report of the Special Development Support Fund,⁷⁶ 252 affordable housing projects were underway in 2021, representing over 3,300 dwellings. Between 2017 and 2022, the Ministry of Housing's investments increased massively from €40 million to €174 million. This money invested in the public interest also stimulates the construction sector. The private sector and its workforce are largely involved in this collective national effort.

With the Affordable Housing Reform Project⁷⁷, management and allocation of public housing will become more transparent. It provides for a definition of affordability, the introduction of a uniform calculation of affordable rent (according to the scale of effort) and the concept of social landlord, as well as the introduction of a national register of affordable housing.

More protection for tenants

The reform of individual aid⁷⁸ provides for more generous aid and simplified procedures for both tenants and landlords. This reform, as well as the reform of affordable housing, adopted by the Government Council in December 2021, are awaiting a decision by the Council of State.

The government decided to react quickly to the emergency for private market tenants in the tripartite agreement in March 2022⁷⁹ and to introduce the adjustments to the rent subsidy that were planned in the bill on individual aid in advance. Accordingly, the subsidy has been increased on average by more than 50% for different types of households. In 2022, the Ministry of Housing granted almost €18 million in rent subsidies to more than 8,400 households.

⁷⁴ See: <https://logement.public.lu/fr/professionnels/communes/pacte-logement.html>

⁷⁵ See: <https://logement.public.lu/fr/actualites/2022/11/monitoring-final-pacte-logement-1.html>

⁷⁶ See: <https://logement.public.lu/fr/publications/observatoire/2022-monitoring-pacte-logement-1-0.html>

⁷⁷ See: <https://logement.public.lu/fr/politique/06-pk-reform-79.html>

⁷⁸ See: <https://logement.public.lu/fr/politique/06-pk-reform-79.html>

⁷⁹ See: <https://logement.public.lu/fr/actualites/2022/03/31tripartite.html>

The tenancy reform⁸⁰ is the third major housing reform project in the pipeline. Following the submission of the draft in 2020, in October 2022 the Government Council adopted a series of government amendments further strengthening the protection of private market tenants, while ensuring that investment in housing was sustained. Key elements of the reform are:

- Better regulating agency fees and the rental guarantee
- Facilitate co-tenancy and strengthen the rights of the contracting parties
- Clarify the methods for determining the amount of capital invested
- Clarify the rent ceiling in the case of furnished accommodation, particularly furnished rooms
- Reform of the rent ceiling :
 - the maximum annual rent ceiling, currently limited to 5% of capital invested (revalued and discounted) in a property, is reduced to a rate of 3.5% of capital invested revalued and discounted;
 - this amount is set at 3% for dwellings with energy performance certificates of categories F, G, H or I (dwellings with high heating costs due to their energy efficiency).
- Increasing transparency of the rental market and accountability of the landlord:
 - it will become mandatory for landlords to determine the amount of capital invested, revalued and discounted before renting out their property;
 - the amount of the invested capital, revalued and discounted, must be indicated in the lease contract;
 - failure to do so will result in a rent limit of €8 per square metre of floor area.

In addition to these reforms and efforts, a package of fiscal measures⁸¹ was adopted by the Government Council in October 2022, including the reform of the property tax, the introduction of a national tax on the use of land, and the introduction of a national tax on the unoccupied housing. In addition, there are two other projects to accelerate the process of making land available, the *Baulandvertrag* and ministerial re-parcelling, which are still pending.

Functioning of the Single Market

The 30th anniversary of the Single Market this year should be an opportunity to renew our commitment to deepening the fundamental freedoms of the Treaty - beyond maintaining the status quo. In the face of multiple crises and in order to achieve the Union's ambitious long-term goals, only a fully integrated single market can act as an effective shield against internal and external shocks. Industrial policy and single market integration are complementary and must go hand in hand.

Since its creation in 1993, the single market has provided new opportunities for citizens, created jobs, contributed to growth and removed many barriers to trade. Thanks to this intra-EU trade, the Single Market has generated around 56 million jobs and contributed to a structural increase of around 9% of GDP in the EU.⁸²

Luxembourg, a perfect example of the "small open economy", is among the countries that have benefited the most from the progressive implementation of the Single Market. Considering that 45% of the workforce is made up of cross-border workers and 85% of goods and 50% of services are imported from other EU countries, the single market is an essential reality in Luxembourg, one that is part of the daily experience of Luxembourg companies and citizens. In contrast, our country is also one of the first to suffer when the single market does not function properly.

⁸⁰ See: <https://logement.public.lu/fr/politique/lareformedelalegislationsurlebailausagedhabitationrevueetcompletee.html>

⁸¹ See: https://mlog.gouvernement.lu/fr/dossiers.gouv_mint%2Bfr%2Bdossiers%2B2022%2Bimpot-foncier.html

⁸² "Legal obstacles in Member States to Single Market rules"; Policy department for Economic, Scientific and Quality of Life Policies Directorate-General for Internal Policies; European Parliament, November 2020: [https://www.europarl.europa.eu/RegData/etudes/STUD/2020/658189/IPOL_STU\(2020\)658189_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2020/658189/IPOL_STU(2020)658189_EN.pdf)

Recent events during the COVID-19 crisis revealed the fragility of the single market. At the height of the pandemic, many Member States closed their borders to workers, goods and services from other EU countries. These measures in violation of EU rules further aggravated an already existing rift.

This unfortunate reality and the current multi-crisis context have demonstrated the importance of a fully functioning and well-integrated single market. However, it should be remembered that a well-functioning single market is not a "crisis" issue but a daily reality.

To meet these challenges, to achieve our ambitious climate goals and to make a success of the green and digital transitions, the Union must be able to rely on a resilient and fully integrated single market. This is all the more important if we are to face up to international competition. In order to achieve greater strategic autonomy in vital areas such as critical raw materials or semiconductors, a deeper integration of our legal framework is needed.

While the EU has recently made significant progress in adopting a more systematic and strategic approach to industrial policy, the process of approximation to EU rules is lagging behind. According to the European Commission, in the area of services, around 60% of the barriers identified 20 years ago still exist today.

Concrete and specific actions are therefore needed to remove these persistent barriers. As regards the proposed new EU initiatives based on Article 114 TFEU (legal basis internal market) and other texts, these should be based on the fundamental principles of harmonisation and mutual recognition of EU legislation.

Furthermore, entrepreneurs need simple administrative procedures, accessible information and a more targeted and uniform application of single market rules. Well-designed European rules have the advantage of simplifying life for citizens and businesses, especially SMEs, by replacing the patchwork of 27 national frameworks with a single set of rules.

Further progress is also needed in terms of enforcement of existing rules. Rigorous enforcement of the EU "*acquis communautaire*" is essential, not only in terms of political and legal certainty, but also to ensure the credibility and effectiveness of the EU - including on the international scene.

In this context, we welcome any initiative of the European Commission to better enforce EU rules, such as the implementation of the Single Market Enforcement Taskforce (SMET). Furthermore, structures already active and operational in this field, such as SOLVIT, should be further strengthened. This network deals with problems encountered by citizens and businesses related to the misapplication of EU legislation by a public administration in a Member State. The growing volume of incoming complaints at SOLVIT and the high overall resolution rate in the network - with 80% of cases resolved within about 10 weeks - demonstrate its benefits for citizens and businesses. Although the SOLVIT network helps to identify structural or recurring problems arising from the misapplication of EU law, it is nevertheless incumbent on the European Commission to fully assume its role as guardian of the Treaties and to put the application of existing EU law at the top of its agenda, including at political level.

In order to achieve all these objectives, a tangible and long-term programme of action is needed, backed up by political dedication and commitment at all levels.

3.3. Policy measures taken to implement the principles of the European Social Charter

In 2017, the European Pillar of Social Rights was adopted, enabling the European Union to set a framework and objectives in social matters. The European Pillar of Social Rights aims to level up social law in the Member States. At European level, it involves a systematic meshing of social policies via the

European Semester. This mechanism, set up in response to the financial crisis, recommends that reforms be introduced to maintain the economic and budgetary health of the Member States. The European social rights framework was therefore conceived as its alter ego in social matters. Each EU Member State has therefore submitted an action plan for the implementation of social rights in 2022.

Beyond its symbolic dimension, this text has already inspired many initiatives such as the guarantee of a work-life balance (*Draft Bill No. 8016 amending the Labour Code aims to transpose Directive (EU) 2019/1158 of the European Parliament and of the Council of 20 June 2019 on work-life balance for parents and caregivers*). Luxembourg has presented in its National Action Plan a whole range of measures to improve European social rights for the coming years.

The recommendations in the context of the European Pillar of Social Rights aim to promote job creation in the recovery and to support transitions to growth sectors. They encourage Member States to support measures to encourage recruitment, opportunities for further training and retraining, and enhanced support for employment services. In this context, the transformation and upgrading of skills is a key issue. Under the impact of the crisis, as well as the influence of automation and changes linked to digital and environmental transitions, jobs are being transformed and changes in skills are a major challenge.

It is therefore not only a question of accompanying this dual digital and ecological transition with specific measures, but also of adapting social regulations so that the Member States make progress in their commitment to be more equitable and inclusive.

Skills Strategy Study

The Luxembourg government mandated the OECD to carry out a Skills Strategy study in Luxembourg - with the financial support of the European Commission. The study actively involved 160 actors from the Luxembourg ecosystem and the results were presented on 23 February 2023.

The OECD work confirmed that in many areas Luxembourg has relatively high skills performance, e.g. the level of higher education of young adults is among the highest in the OECD. However, the Grand Duchy faces many skills challenges, such as frequent talent shortages, a low share of the poorest people in adult education and a lack of reliable data on skills needs.

Based on these findings, the OECD has formulated 47 recommendations tailored to Luxembourg's specific situation, addressing four thematic areas:

- Providing labour-market-relevant adult learning opportunities in Luxembourg
- Guiding and incentivising skills choices in Luxembourg
- Attracting and retaining foreign talent to fill skills shortages in Luxembourg
- Strengthening the governance of skills data in Luxembourg

The study is being translated into a roadmap of practical actions. Many actions are already underway, such as:

- ADEM's new *Skills4Job* training programme (currently in the pilot phase)⁸³
- The new *Skills-Plang* programme⁸⁴

Sector-based studies and continuing vocational training

In order to create more transparency on the needs and trends of the labour market, ADEM carries out sector-based studies, in partnership with other players in the ecosystem such as employers' federations, which it publishes in the form of reports, videos and practical guides. These studies focus

⁸³ Please see chapter 3.1. on the projects funded under the RRF for more details.

⁸⁴ Please see chapter 3.1. on the projects funded under the RRF for more details.

on the green and digital transitions and the impact they have on the structure of jobs and skills. They use advanced analytical methods such as text mining to extract data on the skills required from job vacancies.

These developments are impacting the skills requirements in the labour market. In order to secure the work potential of employees and to act preventively against unemployment, it is essential to invest in continuing vocational training. Continuing vocational training subsidies from the Ministry of Education, Children and Youth are essential, but are not sufficient to encourage companies to invest in reskilling or upskilling their staff.

Based on the latest available data from the Enterprise Europe Survey (Eurofound, ECS 2019), only 32% of employers in Luxembourg offer training to most of their staff, which is below the EU average (35%), with an even lower share for small and medium-sized enterprises (SMEs).

It was against this backdrop that already in 2018, the Ministry of Labour, Employment and the Social and Solidarity Economy, the Ministry of the Economy and the ADEM Employment Development Agency, launched the pilot project "Luxembourg Digital Skills Bridge" (LDSB)⁸⁵, with the aim of anticipating the repercussions of technological developments on employment and testing the relevance of supporting companies and their employees in the transformation of jobs and skills.

In the meantime, the pandemic further accelerated upheaval in the labour market and increased the discrepancy between skills required and those available. In response, the government set up the "Skillsdësch", a platform that unites government and social partners to design and implement a skills strategy.⁸⁶

One action planned by the "Skillsdësch" is the institutionalisation of a service offer as piloted in the LDSB project. ADEM developed the concept for this type of forward-looking employment and skills management programme, called "*Skills-Plang*", in the light of the lessons learnt from the LDSB pilot project. This concept was presented for consultation to the social partners at the meetings of the Standing Committee on Labour and Employment on 28 June 2022⁸⁷ and 4 October 2022, and agreement in principle was reached on this new programme.

Measures to combat the COVID-19 crisis

The short-time working scheme for cases of *force majeure* linked to the COVID-19 crisis was introduced in March 2020. Almost one third of employees in Luxembourg took advantage of the short-time working scheme.

In view of the exceptional situation, the criteria for requesting and obtaining partial unemployment were adjusted. Thus, the partial unemployment scheme for cases of *force majeure* was in principle applied to companies in all economic sectors as long as the grounds cited were directly related to the crisis.

The special arrangements for short-time working were retained until 30 June 2021, taking into account the fact that some sectors or branches of the economy were more severely affected than others.

A system of advances has been introduced as a matter of urgency in order to alleviate the cash flow problems of companies that were obliged to temporarily suspend their operations.

An automated system allowing companies to apply for short-time work online was introduced to speed up the procedure.

⁸⁵ Communiqué of 2 May 2018: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2018/05-mai/02-digital-skills-bridge.html

⁸⁶ Please see chapter 3.1. on the projects funded under the RRF for more details.

⁸⁷ Communiqué of 28 June 2022: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2022/06-juin/28-engel-skills-plang.html

Between March and December 2020, around 155,000 individual employees moved to short-time working, mainly in the construction, trade, repair and HORECA sectors. A total amount of about €987 million of compensation was paid out to employees impacted by the crisis.

The initial budget for short-time work for the budget year 2020 had to be adjusted from €11,000,000 to €1,050,000,000.

As regards short-time working due to force majeure, 14,832 separate companies took advantage of this mechanism between March and June 2020, benefiting 353,135 employees (147,845 individual beneficiaries).

Paternity leave (Draft Bill N°8017)

The changes to the Labour Code provided for in Bill No. 8017 submitted to the Chamber of Deputies on 2 June 2022 are still subject to amendment. This bill aims to:

- Change the concept of 10 days of extraordinary leave granted for the birth of a child to 80 hours of extraordinary leave to allow the persons concerned to take leave in a more flexible way. The number of hours will be prorated according to working time for those concerned working part-time.
- To also allow self-employed persons to enjoy 80 hours of paternity leave, of which a maximum of 64 hours could be covered by the state budget under the same conditions as for employees ("only on application by self-employed persons to the Ministry of Labour, Employment and the Social and Solidarity Economy. The remuneration taken into account for the reimbursement is limited to five times the minimum social wage for unskilled employees. Paternity leave can be split and must be taken within two months of the event").
- Facilitate access to extraordinary leave for same-sex couples. Currently, the parentage laws oblige these couples to create a parental link with a child through adoption, but this is not an obligation in Luxembourg's neighbouring countries. To avoid forcing these couples to adopt a child in order to comply with the laws applicable in Luxembourg, the draft law provides for the granting of extraordinary leave to the person recognised as the second parent by the applicable national (country of residence) legislation.
- Facilitate the administrative process necessary to obtain the reimbursement from the state budget by making it mandatory to submit the application digitally/digitally through a secure government platform that requires strong authentication and guarantees the authenticity of the application and that it not be rejected, as well as the identification of the applicant.

Measures to combat long-term unemployment

The scheme to combat long-term unemployment, which has been in force since July 2017, aims to support the generation of new jobs in the municipal, para-public or social sector that address real issues. These jobs must be new, not aimed at replacement and above all not create situations of unfair competition with the market sector. Specific measures are aimed at job-seekers aged 50 and over. Since the launch, 80% of the participants in this scheme are aged over 50.

Professional redeployment system

The reform of the professional redeployment system, which has been in force since 1 January 2016, aims to speed up the procedures, better safeguard the rights of people undergoing external redeployment and create the necessary framework for favouring internal redeployment.

The idea is to support the efforts of companies to improve working conditions, primarily by providing experts, to encourage internal redeployment, i.e. within companies, rather than outplacement and, above all, to improve the reintegration of outplacements into employment.

The professionalisation course and the re-employment contract are two measures, applicable since 1 January 2016, aimed at jobseekers aged at least 45 or those undergoing an outplacement procedure or who are disabled employees. The first measure is an internship of a maximum length of six weeks offering jobseekers the opportunity to demonstrate their professional skills within a company. The second measure offers job-seekers an opportunity to improve their professional knowledge and skills in a company for up to 12 months. These measures are intended for companies that can offer a real chance of subsequent employment on a permanent contract. Against the backdrop of the pandemic, these measures were temporarily extended (from 24 July 2020 to 31 December 2021) to categories of job-seekers previously excluded.

Creation of an employment inclusion assistance service

The law dated 1 August 2019 supplementing the Labour Code by creating an employment inclusion assistance programme for disabled employees and employees in outplacement procedures, aims to facilitate the integration and, above all, retention in employment, particularly of people with the status of disabled employee, by creating an initiative called "employment inclusion assistance". In concrete terms, the law provides that disabled employees or those in outplacement procedures, together with their employers, can request assistance from ADEM. The purpose of this assistance is to support the inclusion of the employee within the company. The assistance is based on the needs of the employee, but also of the employer and other colleagues in the company. The creation of the activity of 'employment inclusion assistance' thereby helps to reduce the unemployment rate of people with the status of disabled employees.

While the measures to implement the principles of the European Pillar of Social Rights presented above are mainly concerned with working life, the Luxembourg government has also taken measures that concern the living conditions, living together in harmony and the well-being of the residents, which are presented below.

Renewal of the cost-of-living allowance for 2023

In order to combat the working poor phenomenon and to provide specific social transfers, the Government Council has extended the cost-of-living allowance for low-income households to 2023.

Energy premium for low-income households

Due to soaring energy prices, the government adopted a package of measures in 2022 under which the energy premium for low-income households was introduced. This energy premium has been renewed for the year 2023 to specifically support the most vulnerable households.

Introduction of an energy tax credit and continued cost-of-living adjustment of family allowances

Following the tripartite agreement signed on 31 March 2022 between the government and representatives of the *Union des entreprises luxembourgeoises* (UEL), the LCGB and the CGFP, a series of specific measures aimed at mitigating the effects of inflationary pressures on both businesses and households were put in place. This agreement contains aid to businesses and measures to compensate for the loss of purchasing power, in particular of low- and middle-income households, linked mainly to the index bracket triggered in June 2022 and deferred to April 2023. The purpose of the law dated 29 June 2022 transposing certain measures provided for in the tripartite agreement of 31 March 2022 is to implement some of these measures, including the report of the index bracket to April 2023 and compensation for the loss of purchasing power linked to this delay. Thus, the text introduced a socially targeted energy tax credit intended to compensate for, or even over-compensate for, the loss of purchasing power of salary categories below €100,000 per year. In the same vein, an equivalent tax credit is awarded to each beneficiary of the social inclusion income and to each beneficiary of the

income for the severely disabled. In addition, the law introduces a sliding scale of family allowances, which makes it possible to continue to adapt family allowances to changes in the cost of living.

Compensation for additional costs due to energy price increases

The law dated 16 December 2022 authorising the State to participate in the financing of the additional costs of energy and electricity borne by integrated centres for the elderly, care homes, supported housing for the elderly and psycho-geriatric centres approved under the amended law dated 8 September 1998 regulating relations between the State and organisations working in the social, family and therapeutic fields was recently passed. The purpose of this law is to compensate the managers of accommodation facilities for the elderly and psycho-geriatric centres for the additional costs arising from increases in energy prices. In return, the managers undertake not to increase housing prices or daily prices during the period from 1 October 2022 to 31 December 2023.

Reintroducing indexation of the child benefit programme

In the law dated 17 December 2021 on the State revenue and expenditure budget for the financial year 2022, the government has reintroduced the indexation of the family allowance as of 1 October 2021. This measure will increase the purchasing power of families with children.

Integration

In 2022, the Integration Department of the Ministry for Family, Integration and the Greater Region accelerated the digitalisation of the services offered in the framework of the Welcome And Integration Contract (CAI). In order to make them more accessible, two online administrative procedures are now available on MyGuichet.lu, namely making an appointment for a personal orientation and requesting the certification of the CAI. In 2022, 59% of the language and civic education courses offered through the CAI were also held online, while the two orientation days were organised in hybrid mode. On the strength of these results, the Department will step up its efforts in 2023 to further simplify the administrative follow-up of CAI cases and improve the quality of messages supporting integration and living together, in particular by developing a new CAI manual. At the same time, the Department will continue its collaboration with Zesumme-Vereinfachen.lu in order to involve CAI signatories in a participatory evaluation process.

In September 2022, the Department launched the virtual platform InfoLux.lu, with the aim of providing quick access to information on daily life in Luxembourg and facilitating active participation in intercultural living together, in the form of a virtual fair. While the platform can be used by all those who live and work in Luxembourg, it is primarily intended as an orientation tool and help for newcomers.

The website www.myrights.lu⁸⁸ of the *Ronnen Dësch* Group, co-financed by the Ministry, provides key information on housing, health, education, daily life, employment, migration and asylum in the Grand Duchy of Luxembourg. Under the slogan "all your rights, in one location", this website is mainly aimed at newcomers and offers a catalogue of organisations, administrations and associations offering active support in one or more of the above-mentioned areas.

In view of the municipal elections on 11 June 2023, the Department focused on the national awareness campaign "I can vote". Thanks to a change in the electoral law, all non-Luxembourgers of voting age on the day of the elections can now participate in the municipal elections, without any residence time restrictions. One of the objectives of the "I can vote" campaign is to raise awareness among non-

⁸⁸ See: <http://www.myrights.lu/>

Luxembourg residents and to strengthen their active participation in the democratic life of the country.

With regard to the strategic axes of integration policy, an assessment of the National Action Plan on Integration is currently being carried out by the Inter-ministerial Committee on Integration, in order to inform future strategies on intercultural living together. In 2023, new NAP projects will focus on promoting intercultural living together through local community life. In addition, 31 municipalities are now participating in the pilot project "*Pakt vum Zesummeliewen*".

With regard to the study on racism and ethno-racial discrimination, launched in 2021 and conducted by LISER and the Centre for Intercultural and Social Studies and Training (CEFIS) under the coordination of the Department, the final report was officially presented to the Chamber of Deputies in March 2022. A module on the experiences of victims of racism and discrimination, carried out by CEFIS, will complement the study in 2023. In order to respond to the need for awareness-raising expressed by the resident population, a cycle of four conferences "Us and the others" on racism and ethno-racial discrimination in Luxembourg was organised between September 2022 and January 2023. In addition, the Ministry of Family, Integration and the Greater Region announced that a National Action Plan against Racism and Racial Discrimination would be developed in 2023. Since June 2022, the Department of Integration has also been offering a compulsory three-hour training course on diversity and non-discrimination to new municipal civil servants in temporary service, as part of their special training.

To conclude, after the public consultation phase carried out in 2020-21, the Ministry for Family, Integration and the Greater Region prepared a draft bill in 2022 on intercultural living together and amending the amended law dated 8 March 2017 on Luxembourg nationality. The text, submitted to the Chamber of Deputies on 20 February 2023, seeks to replace the current "integration" approach with a broader and more open approach to "intercultural living together". As such, the bill provides for a global overhaul of the instruments of intercultural living together and repeals the amended law dated 16 December 2008 concerning the integration of foreigners in the Grand Duchy of Luxembourg.

Personal autonomy for people with disabilities

The policy on support for people with disabilities is based on respect for individual autonomy.

The Luxembourg Institute of Socio-Economic Research (LISER) was commissioned by the Ministry of Family, Integration and the Greater Region to carry out a study on socio-educational support (ASP), in collaboration with representatives of the disability field, within the framework of the steering committee provided for in the ASP convention. The aim of this study is to take stock of the current ASP system and to recommend a common approach to disability assessment based on the principle of a "one-stop-shop". It also seeks to offer a new system of funding and support that promotes the autonomy of people with disabilities through a personal assistance budget, while taking into account their specific needs. The results of this study are expected by the end of 2024.

Since January 2023, the Ministry for Family, Integration and the Greater Region, in collaboration with LISER, has also launched a survey on the needs of people with disabilities in Luxembourg. The objective of this survey is to evaluate what currently exists and what should be put in place in Luxembourg so that people with disabilities can manage their daily lives more independently. The survey will provide statistics on the current situation of people with disabilities and will draw up an inventory of the aids and measures they currently receive. This survey is carried out in accordance with the requirements of the United Nations Convention on the Rights of Persons with Disabilities, which Luxembourg signed in 2007 and ratified in 2011.

These two studies should lead to the creation of a personal assistance budget so that all persons with disabilities can finance the aids they need independently and in accordance with their own preferences.

National Action Plan for implementing the UN Convention on the Rights of Persons with Disabilities 2019-2024

With the ratification of the UN Convention on the Rights of Persons with Disabilities in 2011, Luxembourg has committed itself to progressively implementing the principles of this Convention. The new national action plan for implementing the UN Convention on the Rights of Persons with Disabilities 2019-2024 comprises 29 priorities, 55 objectives and 97 specific actions that the ministries concerned are committed to carrying out.

The action plan was drawn up by the Ministry for Family, Integration and the Greater Region in close consultation with other government departments, associations, various stakeholders, the High Council for People with Disabilities and the Steering Group. Each ministry is responsible for the implementation of the various measures in the action plan that fall within its remit.

An indicator and a deadline are given for each of the 97 specific actions. The indicators and deadlines made it possible for an external evaluator to carry out a first mid-term evaluation in 2022. The final evaluation will take place in 2025.

A steering group of ministries with specific activities in the action plan was set up in response to the recommendations of the mid-term evaluation. These ministries meet regularly in eight working groups specific to the different topics of the action plan and report their progress to the individual ministries and to the Steering Group.

The Steering Group is also supported by relevant persons from the Higher Committee for Persons with Disabilities, the Centre for Equal Treatment, the Advisory Commission for Human Rights and the *Ombudsman* to form a monitoring group.

Accessibility for all to places open to the public, public roads and collective housing buildings

Luxembourg has adopted a new law in the field of accessibility (law dated 7 January 2022 on the accessibility for all to places open to the public, public roads and collective residential buildings) which will come into force on 1 July 2023. This law is an essential element of the policy for people with disabilities, the inclusion of people with disabilities in social life under equal conditions and the guarantee of the most independent life possible.

Social Inclusion Income (REVIS)

In the area of policy against social exclusion, the amended law dated 28 July 2018 on the social inclusion income provides access to services and activation measures in addition to financial benefits. Beneficiaries under the jurisdiction of the National Office for Social Inclusion get individualised follow-up by regional officers in the Social Offices.

Thirty-eight per cent of them are directed towards measures such as "community work" to prepare for a possible transition to the labour market. Every second beneficiary is referred to stabilisation or preparation measures, especially in the field of training. The state invests in the development of training to support participation in society, with offers specifically targeted at the beneficiaries involved (language training, use of public services, digital inclusion).

An evaluation of the scheme is currently underway with a view to publication in 2023, focusing on whether the objectives of the law have been achieved and how the services concerned are functioning.

Adaptations of the Minimum Wage, REVIS and Allowance for the severely disabled (RPGH)

As of 1 January 2023, the amounts of the Social Inclusion Income (REVIS) and the Allowance for the severely disabled (RPGH) were increased by 3.2%, identical to the increase in the minimum social wage (SSM) rate.

On 1 February 2023, the amounts of the SSM, REVIS and RPGH were increased by 2.5% as a result of the application of an index band. On 1 April 2023, the amounts of the SSM, REVIS and RPGH were again increased by 2.5% following the triggering of the index tranche in June 2022 and reported to April 2023 in accordance with article 3 of the law dated 29 June 2022 transposing certain measures provided for in the tripartite agreement dated 31 March 2022.

Social Assistance Act

In the course of 2022, the 30 Social Offices provided non-reimbursable grants totalling €4,338,702. This measure was allocated an annual budget of approximately €24.25 million (50% of which was paid by the State and 50% by the municipalities).

It should also be noted that staff key of the Social Offices was increased on 1 January 2023. The Social Office, as a one-stop shop, is often the first point of contact for people in distress. Various current phenomena, such as the socio-economic impact of the pandemic, the increase in energy prices or the rise in housing costs, particularly affect households in difficulty, which inevitably leads to an increase in the number of people resorting to social assistance. In response to this, and in order to react to the current socio-economic situation, the Social Offices have been strengthened in terms of staffing so that they can fulfil their mission of supporting people facing an increased risk of poverty or social exclusion, while guaranteeing a quality service.

European Fund for Assistance to the Most Deprived (FEAD)

In Luxembourg, the FEAD helps to respond to a situation of distress in terms of food and basic material goods. In 2022, 13,471 people in 5,643 households received food aid and basic material aid.

Homelessness and exclusion from housing

As the national strategy against homelessness and exclusion from housing (2013-2020) has come to an end, the Ministry has commissioned LISER, a public research institute, to carry out the final evaluation. The evaluation will verify the implementation of the actions recommended in the strategy and the achievement of the defined objectives. It will analyse the effects of this implementation and make recommendations to enable the Ministry to continue its efforts against homelessness in a consistent manner. This evaluation is currently being finalised and the results will be presented as soon as the report is finalised.

In order to reduce homelessness and housing exclusion, the Ministry will put into practice the conclusions and recommendations of the final evaluation of the strategy and will continue its efforts by implementing actions in favour of the most vulnerable people, especially by focusing on the Housing First approach. In order to promote the Housing First concept in Luxembourg and to support professionals in the field, the Ministry is considering the collaboration with an expert in the field of Housing First.

With the signing of the Lisbon Declaration in June 2021, on the creation of the European Platform on Homelessness, the government has reiterated its commitment to the fight against homelessness and housing exclusion in all its forms.

The first homeless count, carried out in October 2022 in the City of Luxembourg, is part of this framework and its results will enable the Ministry to promote the implementation of evidence-based

measures. A follow-on edition of the count is already being planned. There are still plans to extend the exercise to other parts of the country.

The Ministry continues to increase and diversify its offers for homeless people, in cooperation with non-governmental organisations. A concept for a care home for ageing homeless people is being developed. There are plans to further develop the low-threshold provision in the capital, including the creation of a new fixed night shelter.

Quality of services for older people

A bill on the quality of services for the elderly has been submitted to the legislative procedure. Its aim is to improve the quality of infrastructure, services and facilities for the elderly, in particular by setting minimum standards for the licensing of care providers. In the interests of transparency, a publicly accessible register will indicate the characteristics of accommodation facilities, benefits and services and the prices of these services.

Revision of the law and the Grand-Ducal Regulation on gerontological care

At present, a "gerontological care" supplement may be paid under certain conditions to persons admitted to facilities whose personal resources are inadequate to cover the cost of accommodation and personal needs. As part of a review of the scheme, a draft bill (no. 8114) creating a supplementary allowance for the elderly has been submitted to the legislative procedure. This bill is innovative in that it seeks to cover not only the cost of accommodation, but also products, services and benefits that are considered essential, namely providing and cleaning of linen, basic hygiene products and communicating and obtaining information through access to information and communication technologies. These measures will enable the beneficiaries to live with dignity in the accommodation facilities and to participate actively in social life.

Reference budget

The reference budget is a monthly amount that represents all the goods and services that a certain type of household needs to live decently and to participate actively in society. The different basic needs are grouped into different baskets. In order to determine this minimum budget, STATEC is implementing the project "Household needs - Moving towards a reference budget" on behalf of the Ministry for Family, Integration and the Greater Region. In 2022, work began on a basket dedicated to the needs of the elderly. In view of the complexity of old age, it was decided to calculate different budgets according to the situation of the elderly. The calculations for active and independent elderly people have been finalised and will be followed in 2023 by a budget for elderly people with support needs.

Reconciling work and private life

Making parental leave periods more flexible and improving its details, as well as substantially increasing the parental leave allowance, introduced by the reform in force since 1 December 2016, have been very successful. Prior to this reform, the education allowance and the maternity allowance were abolished in order to promote employment, especially female employment, and job retention. These measures support the financial independence of both parents and thus act against the risk of poverty. The expected positive effects on the reconciliation of private and professional life, on equal opportunities and on the time that parents, and especially fathers, have available for the upbringing of their children have been achieved through this package of reforms.

On 31 December 2022, 12,698 people were on parental leave, compared with 11,636 on 31 December 2021.

Parental leave is steadily increasing. After a slowdown in the growth of parental leave, it unexpectedly accelerated in 2022. The following table shows this unforeseen upturn. On analysis, it can be said that this increase was mainly triggered by men, who recorded an increase of +15.89% within one year.

The tables below illustrate the evolution of parental leave in more detail.

Table 6: Comparison between the first and second parental leave - situation on 31 December of each year

Year	Women: 1 st leave	Men: 1 st leave	Women: 2 nd leave	Men: 2 nd leave	Total
2013	2,859	141	169	908	4,077
2014	3,006	122	200	928	4,256
2015	3,268	149	221	957	4,595
2016	3,320	187	237	976	4,720
2017	4,058	327	519	3,347	8,251
2018	4,287	402	588	4,319	9,596
2019	4,364	456	580	4,987	10,387
2020	4,555	486	529	5,316	10,886
2021	4,882	523	568	5,663	11,636
2022	4,907	564	622	6,605	12,698

Since the parental leave reform in 2016, parental leave has become more attractive to men. In the past, the majority of parental leave was taken by women. In 2018, almost gender parity was achieved. As of 31 December 2022, 7,169 men and 5,529 women have taken parental leave, which is a difference of 29.66%.

Table 7: Comparison of full-time and half-time parental leave - situation at 31 December of each year

Year	Women full-time	Women part-time	Women split leave	Men full-time	Men part-time	Men split leave
2012	1,896	1,187		342	600	
2013	1,848	1,180		385	664	
2014	1,881	1,325		364	686	
2015	2,187	1,302		387	719	
2016	2,282	1,275		484	679	
2017	3,064	1,231	282	1,378	1,334	962
2018	3,183	1,163	529	1,366	1,326	2,029
2019	3,223	1,146	575	1,569	1,331	2,543
2020	3,411	1,092	581	1,702	1,297	2,803
2021	3,651	1,189	610	1,796	1,436	2,954
2022	3,746	1,165	618	2,147	1,574	3,448

The above table shows that women are more likely to opt for full-time parental leave. In contrast, men have a clear preference for split parental leave.

Social security measures

As part of the implementation of the European social rights framework, the European Commission submitted a recommendation in 2019 on access to social protection for employed and self-employed workers, which was subsequently adopted by the Council on 8 November 2019.

This recommendation aims to encourage Member States to complete or simplify, in accordance with national competencies, access to the most comprehensive social security coverage possible, especially for self-employed persons who do not always benefit from the same protection as employees.

As far as Luxembourg is concerned, however, it should be pointed out that in terms of social security, both the person working for others and the person working on his own account have access to the

same benefits, either on a compulsory basis (in the vast majority of cases) or on an optional basis in certain specific cases (affiliation to social security).

Thus, the Luxembourg system does not require major changes, but rather better targeting of certain measures to simplify access or better support those who are very vulnerable.

Universal health care coverage

The Luxembourg Action Plan provides for the introduction of Universal Health Care Coverage for people who are not otherwise affiliated to sickness and maternity insurance. This project, planned in the coalition agreement 2018-2023, is mainly aimed at homeless people or people in an illegal situation who do not meet the conditions to receive existing social assistance.

In this context, it should be noted that in terms of health insurance, children under the age of 18 are always covered if they cannot be covered by any other means. The cost of this coverage is borne by the State. Thus, access to health care is guaranteed by the Social Security Code to every child up to the age of 18.

The Ministries of Health and Social Security, together with key stakeholders, are in the process of putting Universal Health Care Coverage into practice. The pilot project was presented in October 2021⁸⁹ and became operational in April 2022 so that people can access health insurance benefits through the regulated associations that already follow the people covered by this measure. These associations carry out the administrative procedures and provide regular follow-up, particularly for beneficiaries who require treatment that they could not provide on their own. The pilot project is currently being evaluated with a view to making it permanent.

Immediate direct payment (health insurance)

In addition to the "social third-party payment" system already in place for people on low incomes, the social security bodies are working to set up an immediate direct payment ("third-party payment" system) for services for which a global third-party payment system is not yet in place, particularly for doctors' bills. This new computerised system should be operational in 2023 and allow doctors and insured persons who so wish to arrange for direct financial payment by the CNS for the part borne by the health insurance scheme and to allow the insured person to pay his or her personal share directly, if necessary. In this way, bills would be paid directly without the insured member having to advance the funds. Such a measure would enable all insured persons, particularly families, to benefit from a "third-party payment" system even without fulfilling the conditions for social third-party payment, which will evolve in this new digital world to make it easier to use.

Promotion of membership of self-employed persons in the Employers' Mutual Insurance Association

The purpose of the Employers' Mutual Insurance Association⁹⁰ is to insure employers against the wage costs resulting from the legal obligation to continue paying their employees in the event of incapacity for work due to illness or accident, and to ensure the payment of a cash benefit to affiliated self-employed persons during the period of suspension of the cash sickness benefit. Self-employed persons may join voluntarily. The fact that such affiliation is not compulsory stems from the desire of the persons concerned not to have such an obligation. However, the Chamber of Deputies has looked into the matter and has called on the government to analyse the issue.⁹¹ In the meantime, an awareness-

⁸⁹ Communiqué of 27 October 2021: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2021/10-octobre/27-cuss.html

⁹⁰ See: <https://mde.public.lu/fr.html>

⁹¹ Motion no. 4098 in Parliament: https://www.chd.lu/fr/motion_resolution/4098



raising campaign will be carried out to promote the advantages of joining the Employers' Mutual Insurance Society.

Risk prevention and accident reduction in the workplace (accident insurance)

In the field of social security, the Accident Insurance Association has developed a charter to combat accidents and deaths at work.⁹² This has quantified targets for the period 2016-2022 and key performance indicators (KPIs) have been set up to measure the impact of the actions taken by all stakeholders. The strategy has been reviewed and adapted to current and future challenges for the new period starting in 2023, such as the use of telework, which has its advantages but also risks. It is important to ensure that working at home does not become an additional burden for the individual (separation of private and professional life, adaptation of private premises for teleworking, etc.).

⁹² See: <https://visionzero.lu/fr/strategie/>

4. Progress towards the Sustainable Development Goals (SDGs)

At the 2015 UN Summit on Sustainable Development in New York, the Heads of State and Government, including the Prime Minister of Luxembourg, adopted 17 Sustainable Development Goals (SDGs) to end poverty, promote prosperity and well-being for all, protect the environment and combat climate change. This 2030 Agenda for Sustainable Development is universal and applies to all countries, developing and developed. The aim is to pave the way for a new development paradigm by 2030, with the guiding principle of leaving no one behind.

In December 2019, the European Commission presented a new growth strategy: the Green Deal for Europe.⁹³ This strategy is more closely aligned with the sustainable development goals of the 2030 Agenda. Countries must mobilise to end all forms of poverty, fight inequality and tackle climate change.⁹⁴ As a result, the UN SDGs have been integrated into the European Semester from the 2019-2020 cycle.

This NRP takes account of this mainstreaming and can thus contribute to policy guidance on the SDGs by monitoring progress and closer coordination of efforts at national level. In this context, it should be recalled that the government adopted the third National Plan for Sustainable Development (PNDD)⁹⁵ at the end of 2019, which is the main instrument for implementing the SDGs in Luxembourg. The PNDD links national policies with Luxembourg's international commitments. It also addresses the ten priority areas for action that Luxembourg has identified in relation to the challenges the country faces. At the UN High Level Political Forum on Sustainable Development on 15 July 2022, Luxembourg presented its 2nd voluntary national review of the implementation of the 2030 Agenda.⁹⁶

In line with the European Commission's guidelines, this chapter presents an inventory and selection of actions implemented in the framework of the SDGs for which the European Commission and Eurostat have identified gaps in their publications.^{97,98} The indicators presented in this NRP are based on these publications and differ from those in the PNDD. The performance assessment is based on Eurostat data.⁹⁹

Goal 1 - No poverty

Introduction

Luxembourg's society is based on diversity. A considerable part of the population is not of Luxembourg nationality, an element to which great importance is attached in social cohesion policies. One of the government's priorities is to strengthen this cohesion by working against all types of social exclusion and discrimination, by actively combating poverty and by promoting social and professional inclusion. The government's objective is to support the implementation of social convergence through the principles set out in the European Pillar of Social Rights, which aims to improve the living conditions of our citizens and implement a series of measures to counteract opposite trends.

⁹³ See: https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_fr

⁹⁴ See: <https://www.un.org/sustainabledevelopment/fr/development-agenda/>

⁹⁵ Communiqué of 20 December 2019: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2019/12-decembre/20-conseil-gouvernement.html

⁹⁶ *Le Luxembourg en transition « Préparer et préserver »*: <https://environnement.public.lu/content/dam/environnement/actualites/2022/07/def-luxembourg-revue-nationale-volontaire-2022-v01.pdf>

⁹⁷ Country Report 2022 - Luxembourg, European Commission: https://commission.europa.eu/system/files/2022-05/2022-european-semester-country-report-luxembourg_fr.pdf

⁹⁸ *Sustainable development in the European Union – 2022 edition*, Eurostat: <https://ec.europa.eu/eurostat/en/web/products-flagship-publications/-/ks-09-22-019>

⁹⁹ See: <https://ec.europa.eu/eurostat/web/sdi/database>

Status

The table shows that Luxembourg ranks above the EU average for most indicators related to the first sustainable development goal. However, the fight against poverty remains a challenge to which the government pays particular attention. The government maintains a strong commitment to the most vulnerable, through a variety of measures to support them. Investments in families and children are being continued, with a particular focus on benefits in kind. However, these are not directly reflected in the at-risk-of-poverty rate, although the impact of these benefits on household living standards is significant.¹⁰⁰

Table 8: SDG 1 Indicators of assessment

Indicator	Unit of measure	Year	Value
People at risk of poverty or social exclusion	% of the population	2021	21.1
People at risk of monetary poverty after social transfers	% of the population	2021	18.1
Severely materially deprived people	% of the population	2021	2.4
People living in households with very low work intensity	% of persons < age of 65	2021	5.5
In work at-risk-of-poverty rate	% of persons aged 18 years and older	2021	13.5
Housing cost overload rate	% of the population	2021	5.1
Self-reported unmet need for medical examination and care	% of persons aged 16 years and older	2021	1.0
Severe housing deprivation rate	% of the population	2020	1.6

Source: Eurostat

Note: Colour of the values (number): red = LU performance below the EU average; orange = LU performance equal to the EU average; green = LU performance above the EU average

Excerpt from the areas of action and the measures put in place

- Creation of an employment inclusion assistance activity.
- Renewal of the cost-of-living allowance for low-income households on 1 January 2023.
- Renewal of the energy bonus for low-income households to counteract soaring energy prices.
- Introduction of an energy tax credit.
- Compensation for additional costs resulting from energy price increases.
- Reintroduction of indexation of child benefit from 1 October 2021 to increase the purchasing power of families with children.
- 3.2% increase in the REVIS and RPGH amounts from 1 January 2023, identical to the increase in the SSM rate.
- On 1 February 2023, the SSM, REVIS and RPGH amounts were increased by 2.5% as a result of the application of an index band.
- On 1 April 2023, the SSM, REVIS and RPGH amounts were increased by a further 2.5% as a result of the application of the indexation band triggered in June 2022 and postponed to April 2023.
- Non-reimbursable financial assistance from the 30 social offices for a total amount of €4,338,702.
- Implementation of measures to reintegrate unemployed or inactive people into the labour market and to increase their work intensity.
- Inclusion in employment for disabled employees and employees undergoing external reclassification, in order to facilitate integration and, above all, job retention.
- Gerontological reception supplement for people admitted to integrated centres for the elderly and care homes whose personal resources do not allow them to cover the costs of accommodation and personal needs.

¹⁰⁰ Rapport travail et cohésion sociale 2022, STATEC: <https://statistiques.public.lu/fr/publications/series/analyses/2022/analyses-05-22.html>

- Digital inclusion action plan for an inclusive society to address the dangers of a digital divide.
- Increase in parental leave allowance, in order to promote employment, especially female employment, job retention and support the financial independence of both parents, thus acting against the risk of poverty.

Goal 4 - Quality education

Introduction

Quality education is of paramount importance, both for the individual and for society at large. It is a cornerstone of inclusive, sustainable and intelligent development. Consequently, the government is pursuing an objective of promoting educational achievement and lifelong skills development in general.

Status

As regards Luxembourg's results in this area, the monitoring indicators show generally favourable performance, save for participation in pre-school education and the indicator from the PISA study on insufficient reading literacy. It should also be noted that during the COVID-19 pandemic, the number of school closures in Luxembourg corresponded to 48 teaching days in primary education and 34 in secondary education, and even less for some classes. These figures place Luxembourg among the OECD countries that closed their schools the least (together with, according to the level of education, Iceland, Japan, Norway and Sweden). In terms of impact, Luxembourg coped well with the early stages of the pandemic: the results of the 2020 national school monitoring, i.e. the standardised tests, showed that pupil performance remained broadly consistent at all levels, with few significant differences from previous years, despite the closure of schools. This stability in student performance demonstrates the resilience of the education system.

Table 9: SDG 4 Indicators of assessment

Indicator	Unit of measure	Year	Value
Early leavers from education and training	% of population aged 18 to 24	2021	9.3
Participation in early childhood education	% of children between the age of three and the starting age of compulsory primary education	2020	89.5
Low achieving in reading	% of students aged 15	2018	29.3
Tertiary educational attainment	% of people aged 25 to 34	2021	62.6
Share of people having at least basic digital skills	% of people aged 16 to 74	2021	63.8
Adult participation in learning	% of people aged 25 to 64	2021	17.9

Source: Eurostat

Note: Colours of the values (number): red = LU performance below the EU average; orange = LU performance equal to the EU average; green = LU performance above the EU average

Excerpt from the areas of action and the measures put in place

- Combating school drop-out rates, in particular through support for pupils at risk of dropping out, monitoring of drop-outs, guidance classes, discovery courses and an appropriate training catalogue.
- Development of quality in early childhood education and care by undertaking major reforms to ensure access to non-formal education for all children and to improve the quality of care facilities.
- Diversification of educational opportunities and a French-language literacy project enabling pupils to access quality training and qualifications corresponding to their various linguistic profiles.

- The *Staark Kanner* initiative is a coherent package of measures for children and their families to give all children the same starting chances and opportunities for success, regardless of their background.
- Draft law No 8079 on the organisation of higher education, and more specifically to review the general framework of higher education and to aim at optimising the administration of study programmes leading to the Advanced Technician Certificate (BTS) and to review the accreditation and monitoring procedures for BTS programmes as well as for higher education programmes offered by private specialised higher education institutions.
- Framework agreement with the Dutch-Flemish accreditation agency NVAO to establish closer cooperation with the purpose of setting up a consolidated and consistent quality assurance system applicable to all public and private higher education degree programmes offered in Luxembourg.
- Accreditation of several new Bachelor's and Master's programmes at the University of Luxembourg in order to guarantee and support quality education in line with innovation trends.
- Development of the adult educational centres programme so that adults can develop both professionally and personally, in the spirit of sustainability and the lifelong development of knowledge and skills.
- Institutionalisation of a service offer as piloted in the Luxembourg Digital Skills Bridge (LDSB) project. ADEM has developed the concept for such a forward-looking employment and skills management programme, called "*Skills-Plang*", taking into account the lessons learned from the LDSB pilot project.
- Implementation of an e-banking training programme to foster social, financial and digital inclusion, ensuring equal access to digital skills for all citizens.

Goal 7 - Clean and affordable energy

Introduction

Improving energy efficiency and promoting renewable energy sources are the foundations of Luxembourg's climate policy and, more broadly, of the energy transition process. The government continues to encourage measures that reduce energy dependency and create growth and employment, such as energy renovations of existing buildings and the use of ecological building materials. In addition, in order to better protect the environment and the climate, the government has set a goal of substantially increasing the share of renewable energy sources in energy consumption.

Status

Luxembourg's performance on this sustainable development objective is uneven. Household energy consumption is relatively high. In addition, the share of renewable energy in the country's energy mix remains rather low, even though Luxembourg has reached its target of 11% renewable energy by 2020. The country also has a high dependence on energy imports. However, it should be noted that the trend over the last few years shows a rather favourable overall tendency for these three indicators. Another positive aspect is that it appears that few people are unable to heat their homes adequately and that the energy productivity in Luxembourg's economy is high.

Table 10: SDG 7 Indicators of assessment

Indicator	Unit of measure	Year	Value
Primary energy consumption	Million tonnes of oil equivalent (Mtoe)	2021	4.2
Final energy consumption	Million tonnes of oil equivalent (Mtoe)	2021	4.1
Final energy consumption in households per capita	Kilogram of oil equivalent (kgoe)	2021	750
Energy productivity	€ per kgoe	2021	12.8
Share of renewable energy in gross final energy consumption	%	2021	11.7
Energy import dependency	% of imports in gross available energy	2021	92.5
Population unable to keep home adequately warm	% of the population	2021	2.5

Source: Eurostat

Note: Colours of the values (number): red = LU performance below the EU average; orange = LU performance equal to the EU average; green = LU performance above the EU average; black = comparison between LU and EU average not applicable

Excerpt from the areas of action and the measures put in place¹⁰¹

- Implementation of the PNEC.¹⁰² Adopted in May 2020, the implementation of the PNEC is a priority. It should be noted that the PNEC is currently being updated and a draft update should be submitted to the European Commission by summer 2023.
- Introduction of a carbon tax of €20 per tonne on petrol, diesel, gas oil, natural gas, paraffin and heavy fuel oil on 1 January 2021, rising to €25 per tonne on 1 January 2022 and to €30 per tonne on 1 January 2023. The revenue from this increase in excise duty will be used for measures to support the energy transition and for measures to promote social equity.
- "PRIME House" programme and its new version "Klimabonus" to promote sustainability, rational energy use and the use of renewable energy in housing.
- "KlimaPrêt" climate loans to promote the sustainable renovation of housing older than 10 years through pre-financing of renovation work. These climate loans not only contribute to responsible energy consumption and environmental protection, but also to lower energy costs and increased comfort.
- Development of renewable energies through a variety of measures, in particular, through investment aid for the installation of photovoltaic power plants following a call for tenders, in order to encourage companies to produce their own energy, entirely or partially. For example, the launch of three different calls for projects in the field of photovoltaics, namely for large-scale projects, agricultural solar power plants and "auto-consumption".
- Continued support for photovoltaic installations, such as via the reduction of the VAT rate for photovoltaic installations to 3% and the modification of the investment subsidies introduced by the *Klimabonus* in 2022 for installations up to 30 kW.
- Establishment of the solar registry in 2020 on a public website to support decision-making in the field of solar energy and to identify the likely capacities of private photovoltaic installations, companies and promoters of projects.
- Change in energy efficiency requirements on 1 January 2023, with the result that heat pumps are used as the reference heating system when establishing the energy pass for a new building.
- Adoption of the hydrogen strategy in July 2021 presenting the political aspects and ambitions and the seven measures planned by the Luxembourg government to develop a renewable hydrogen market.

¹⁰¹ Please also note the measures outlined under Objectives 12 and 13.

¹⁰² Integrated National Energy and Climate Plan: <https://environnement.public.lu/fr/actualites/2020/05/pnec.html>

- Analysis of several pilot projects in the field of geothermal energy to exploit this potential in Luxembourg.
- Promotion of the rational use of energy and renewable energies through municipal subsidies (additional to state subsidies).
- Renewal of the cost-of-living allowance for low-income households on 1 January 2023.
- Application of the facility to avoid energy cuts (electricity and natural gas) due to unpaid bills, in cooperation with the social offices.
- Continuation of the Climate Pact 2.0 with the municipalities in order to guide them towards a sustainable policy in the areas of energy transition, climate change, circular economy, air quality, adaptation to climate change and mobility.
- Signing of three agreements "*Solidaritéitspak*" (31 March 2022), "*Solidaritéitspak 2.0*" (28 September 2022) and "*Solidaritéitspak 3.0*" (7 March 2023) following the meetings of the Tripartite Coordination Committee and including numerous measures to support the purchasing power of households and the competitiveness of businesses, including:
 - An increase in *Klimabonus* financial support for auto-consumption photovoltaic installations adopted in the tripartite agreement of 28 September 2022;
 - A limit to the increase in natural gas prices;
 - A subsidy for customers connected to a district heating system;
 - Stabilization of the electricity price;
 - A subsidy for publicly accessible charging points;
 - A subsidy on the price of diesel used as fuel;
 - A subsidy for liquefied petroleum gas (household bulk propane);
 - Renewal of the energy bonus until the end of 2024 for beneficiaries of the cost-of-living allowance (AVC);
 - A tax credit to offset the cost of the carbon tax for the lowest salaries;
 - Renewal of aid to companies particularly affected by the rise in energy prices.

Goal 12 - Sustainable consumption and production

Introduction

To make a success of the green transition, sustainable consumption and production patterns are essential. In order to improve Luxembourg's ecological footprint, the government wants to make the circular economy and short circuits a key sector of our economy and our daily life. In addition, the government is creating the conditions for the transformation of waste into raw materials and the minimising of food waste. As a consumer, the state wants to set an example by promoting sustainable consumption and taking into account the impacts on the most disadvantaged persons. However, citizens will be encouraged to change their behaviour and their awareness is more important than ever. Education for sustainable development and consumer information on the quality, safety and health of products and their impact on the environment are key elements in the promotion of sustainable consumption.

Status

Luxembourg's performance is below the EU average for most of the SDG 12 indicators. The country's material footprint is high as it continues to consume a lot of raw materials and few materials are recycled and reincorporated into the economy. In addition, the country generates more waste per capita than the EU as a whole, although this is partly due to the increasing number of cross-border commuters who come to work in Luxembourg. However, trends in this indicator have been positive in recent years. Average CO₂ emissions per kilometre from new passenger cars are also higher in

Luxembourg than in the EU. In contrast, Luxembourg performs well in terms of the production of goods and services used in environmental protection and resource management activities. This sector of green activities has been booming for several years.

Table 11: SDG 12 Indicators of assessment

Indicator	Unit of measure	Year	Value
Use of toxic chemicals*	Million tonnes	2021	N/A
Raw material consumption (RMC)	Tonnes per capita	2020	28.6
Average CO ₂ emissions per kilometre from new passenger cars	Grams of CO ₂ per km	2021	123.8
Energy productivity	€ per kgoe	2021	12.8
Gross value added of the environmental goods and services sector	% of GDP	2020	3.0
Circular material use rate	% of material recovered and fed back into the economy	2021	3.8
Generation of waste excluding major mineral wastes	kg per capita	2020	2,154

Source: Eurostat

Notes: Colours of the values (number): red = LU performance below the EU average; orange = LU performance equal to the EU average; green = LU performance above the EU average

For indicators marked with an asterisk (*) data are only available at EU-27 aggregate level

Excerpt from the areas of action and the measures put in place¹⁰³

- Launch of a call for projects in early 2023 to identify potential actors willing to manage a physical kiosk for the sharing economy of underused products with a short rental period.
- Strategy for a circular economy aiming at realising a common vision of the circular economy and developing a toolkit to unite public and private stakeholders and implement the vision through projects in key sectors of the Luxembourg economy.
- A "Product Circularity Data Sheet" initiative to provide reliable data on the circular characteristics of products.
- "Offall- a Ressourcëpak" package of laws, approved by the Parliament in April 2022, with the primary objectives of waste prevention and reduction (see Box 1: Circular Economy and its application).
- Accompanying and financially supporting specific measures aimed at reducing the ecological footprint of events organised in Luxembourg, thereby promoting eco-responsible events by informing, raising awareness and supporting organisers wishing to organise these events.
- Promotion of sustainable consumption and production methods via financial support for specific actions in the field of agriculture such as the *Natur genéissen* (Enjoying Nature) project, launched by SICONA in 2014 to preserve and protect significant habitats in collaboration with farmers and to promote another market for agriculture.
- Adoption of the hydrogen strategy in July 2021 presenting the policy aspects and ambitions and the seven measures planned by the Luxembourg government to develop a renewable hydrogen market.
- Development of renewable energies through a number of measures, including investment aid for installing photovoltaic power plants following a call for tenders, in order to encourage companies to produce all or part of their own energy.
- Introduction of a carbon tax of €20 per tonne on petrol, diesel, gas oil, natural gas, paraffin and heavy fuel oil on 1 January 2021, increased to €25 per tonne on 1 January 2022 and to €30 per tonne on 1 January 2023. The budgetary revenues from this increase in excise duties are earmarked for measures to support the energy transition and measures to promote social equity.

¹⁰³ Please also note the measures outlined under Objectives 7 and 13.

- Introduction in 2015 of the EEOS (Energy Efficiency Obligation Scheme) mechanism with the objective of achieving energy savings among final consumers located on Luxembourg territory, through specific energy efficiency measures.
- A voluntary agreement with FEDIL (period 2021 - 2023) encouraging the industrial sector to increase its energy efficiency.
- Introduction of an obligation to carry out an energy audit every four years for large companies (non-SMEs) from 2015 onwards, with the aim of making companies aware of the potential for energy savings, by identifying specific potential for improving energy efficiency in the company.
- Setting up a new aid scheme to support companies in decarbonisation projects: in addition to the investment aid provided for in the future European framework, it is planned to set up an operational aid linked to Contracts for Difference (CfD) and Carbon Contracts for Difference (CCfD).
- Drawing up a national roadmap for the decarbonisation of the manufacturing industry in Luxembourg with the objectives of identifying and analysing the decarbonisation potential of the manufacturing industry by 2030 and 2050, as quantifiable today by industrial sector and by decarbonisation lever, as well as strategic measures to turn the identified decarbonisation potential into reality.
- Development of the Climate Pact for Business initiative "*Klimapakt fir Betriber*", supporting companies in decarbonisation and energy transition through a structured and coordinated approach facilitating the use of different initiatives, programmes, support and financial aid.
- Paradigm shift in the field of mobility through the implementation of actions and projects proposed by the Global Strategy for Sustainable Mobility (MoDu 2.0) and the PNM 2035.
- Strengthening of the charging infrastructure enabling the decarbonisation of the transport sector, in particular by monitoring the deployment of public charging stations and financial aid for companies investing in charging infrastructure for electric vehicles.
- Creation of the inter-ministerial "Intelligent Mobility" working group with the task of promoting RDI activities, attracting, implementing and coordinating sustainable mobility projects, connecting different stakeholders and identifying synergies between actors and projects.
- Development and implementation of the Business Development Strategy for Decarbonised and Sustainable Mobility focusing on technologies related to decarbonised, sustainable and shared mobility, as well as cooperative, connected and autonomous driving.
- Raising awareness among companies of the need to take environmental protection measures and encouraging them to use available aid (environmental aid scheme) to reduce the financial burden.
- Promotion of the repair of products by offering questions and answers¹⁰⁴ on the Internet to provide detailed information to consumers in order to clarify the legal situation regarding the guarantee of repaired goods and repairer's liability, and to enable consumers to opt more for repair.
- Raising awareness and providing information for more sustainable consumption in the textile sector, including promoting a series of videos on social media channels and providing financial support for a study carried out by Caritas which is supplemented by an exhibition on the path of textiles through the country.
- Drafting of a bill on the implementation and coordination of food policy (Bill No. 7887)¹⁰⁵ aimed at ensuring cohesion between the various national policies affecting the subject of food and food production for the benefit of consumers, producers and processors while considering the views of the multiple stakeholders in the food system.

¹⁰⁴ See: https://mpc.gouvernement.lu/fr/dossiers/2021/repairing/faq_consommateurs.html

¹⁰⁵ Draft law no. 7887: <https://www.chd.lu/fr/dossier/7887>

- Establishment of a Grand-Ducal Regulation concerning the use of the Nutri-Score¹⁰⁶ by Luxembourg producers and distributors providing consumers with greater transparency in relation to products marketed in Luxembourg and enabling them to make better choices.

Box 1: The circular economy and its application

The Luxembourg government fully supports the circular economy. The Strategy¹⁰⁷, developed jointly by the Ministry of Economy, the Ministry of Energy and Spatial Planning, the Ministry of Environment, Climate and Sustainable Development and the Ministry of Finance, presented on 8 February 2021 has started its implementation by setting up a solid governance system and methodology. The governance framework should enable communities to coalesce and the ecosystem to take shape.

A first step is to understand and to embrace the principles behind the circular economy concept. These are reflected in Luxembourg's zero waste strategy. The next step is to transform these principles into a methodology covering practical policy levers to achieve the most circular economy possible in Luxembourg.

Studies conducted ahead of the strategy, such as Luxembourg as a knowledge capital and testing ground for the circular economy published in 2014, the Third Industrial Revolution for Luxembourg in 2016 or the *Null Offall* (Zero Waste) strategy adopted by the government in 2020 have shaped the current approach. The foundations of the circular economy are also anchored in the PNEC as well as in the roadmap *Ons Wirtschaft vu muer* (Our Economy for Tomorrow) for a competitive and sustainable economy for Luxembourg after the COVID-19 pandemic.

The five laws, which were passed in April 2022 and have waste prevention and reduction as their main objectives, are based on the principles of the government's "zero waste" and "circular economy" strategies and lay the groundwork for redefining waste as a resource.¹⁰⁸ The transposition of the 2018 EU Circular Economy Package into national law and the Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the environmental impact of certain plastic products will also bring a range of positive changes for citizens to better manage this waste.

Goal 13 - Climate action

Introduction

Climate change is an ongoing crisis that requires immediate action. Luxembourg is increasingly aware of the consequences of climate change through the increase in average temperature, the amount and distribution of precipitation and a greater frequency of extreme weather events. In this context, the government decided in the coalition agreement 2018-2023 "... to do its utmost to comply with the Paris Agreement and to take into account the conclusions of the 1.5°C special report of the Intergovernmental Panel on Climate Change (IPCC)." As a result, it has committed to a 55% reduction in greenhouse gas emissions by 2030 compared to 2005 levels, as well as to the long-term goal of climate neutrality, which is to achieve "zero net emissions" in Luxembourg, by 2050 at the latest. These two objectives are enshrined in the Climate Act of 15 December 2020.

¹⁰⁶ Grand-Ducal Regulation: <https://legilux.public.lu/eli/etat/leg/rgd/2021/05/07/a396/lo>

¹⁰⁷ See: <https://economie-circulaire.public.lu/fr/publications/strategie-circulaire1.html>

¹⁰⁸ See: <https://environnement.public.lu/fr/offall-ressourcen/principes-gestion-dechets/revision-loi-dechets.html>

Status

As a result of the COVID-19 pandemic and successive confinements, net greenhouse gas emissions - i.e. excluding emissions from land use, land-use change and forestry (LULUCF) - have, as in the rest of Europe, decreased in Luxembourg between 2019 and 2020. However, they are still above the European average when compared to the number of inhabitants. Although fuel sales to non-residents account for a large part of this result, even without them, net emissions per capita would still be in the high range within the EU. For this reason, the PNEC adopted in 2020 - and its ongoing update in 2023 and 2024 - aims to significantly reduce this indicator, through a unilateral target for Luxembourg to reduce its net greenhouse gas emissions excluding the EU ETS and international aviation by 55% compared to their 2005 level. This objective, enshrined in the law dated 15 December 2020 relating to the climate, has been broken down for five key sectors outside the EU ETS. These five sectors - "energy and manufacturing industries / construction"; "transport"; "residential and tertiary buildings"; "agriculture and forestry" and "waste and wastewater treatment" - have each been assigned an emissions target in 2030 and a 2021-2030 sector trajectory to reach it. These "emission budgets" are included in a Grand-Ducal Regulation of 22 June 2022.¹⁰⁹ The economic losses caused by extreme weather situations amounted to €14 million in 2020. It is anticipated that, once the calculations have been finalised, they will be much higher in 2021, which was marked by the severe flooding that hit Germany and the Benelux countries in July. In 2021, the contribution to the international commitment for climate-related expenditure was €39.1 million, an increase of almost 25% compared to 2020. The share of the population covered by the signatories of the Covenant of Mayors for Climate and Energy has remained constant. However, for Luxembourg, the main indicator in this framework is the adhesion of all the country's municipalities to the Climate Pact 2.0 and their level of commitment to this Pact measured through a catalogue of 64 measures established by the European Energy Award (EEA). As for the proportion of renewable energy in the country's energy mix, it remains fairly low and below the EU average. However, trends over the last few years show a rather favourable overall tendency for this indicator. Finally, the average CO₂ emissions per kilometre from new private vehicles are also higher in Luxembourg than in the EU.

Table 12: SDG 13 Indicators of assessment

Indicator	Unit of measure	Year	Value
Net greenhouse gas emissions	tonnes of CO ₂ equivalent per person	2020	16.5
Net greenhouse gas emissions from land use, land use change and forestry (LULUCF) sector	tonnes of CO ₂ equivalent per km ²	2020	-129.8
Climate related economic losses	in € million (current prices)	2020	14
Contribution to the international 100 billion USD commitment on climate related expending	in € million (current prices)	2021	39.1
Population covered by the Covenant of Mayors for Climate & Energy signatories	% of the population	2021	7.2
Share of renewable energy in gross final energy consumption	%	2021	11.7
Average CO ₂ emissions per km from new passenger cars	Grams of CO ₂ per km	2021	123.8

Source: Eurostat

Note: Colours of the values (number): red = LU performance below the EU average; orange = LU performance equal to the EU average; green = LU performance above the EU average; black = comparison between LU and EU average not applicable

¹⁰⁹ Grand-Ducal Regulation dated 22 June 2022: <https://www.legilux.public.lu/eli/etat/leg/rgd/2022/06/22/a328/1o>

Excerpt from the areas of action and the measures put in place¹¹⁰

- Greenhouse gas mitigation is ultimately a cross-cutting policy. In fact, almost all the measures presented under Objectives 7 and 12 have a positive effect on the reduction of greenhouse gas emissions.
- Climate change adaptation strategy 2018-2023 - implementation of priority measures and revision of the strategy for the years after 2023.¹¹¹

Box 2: Climate action measures

Climate Law¹¹² and the associated sector-based objectives; establishment and support of governance bodies

The Climate Act dated 15 December 2020 defines the medium-term (55% reduction in greenhouse gas emissions excluding the EU ETS, LULUCF and international aviation in 2030 compared to 2005) and long-term (climate neutrality by 2050 at the latest) targets for reducing greenhouse gas emissions. Adopted in June 2022, a Grand-Ducal Regulation determines the annual greenhouse gas emission allocations for the period up to 31 December 2030 of the sectors referred to in Article 5 of the amended Climate Law dated 15 December 2020, namely the energy and manufacturing industries (including construction), transport, residential and tertiary buildings, agriculture and forestry, and waste and wastewater treatment. An assessment of the performance of these sectors against their respective targets has already been published for 2021, on 15 March 2023 in accordance with the Climate Act.¹¹³

The Climate Act also establishes new climate governance, including the creation of the 'Platform for Climate Action and Energy Transition' - which seeks to establish a multi-level dialogue between representatives of local authorities, civil society organisations, the business community, investors and other relevant stakeholders as well as the general public - and the 'Climate Policy Observatory', which is intended to provide a scientific assessment of existing and planned climate policy measures. The observatory published its first annual report in October 2022.¹¹⁴

***Klimabonusbës*ch (Investigating measures with positive effects on climate protection in agriculture and forestry)**

The government encourages private forest owners to participate in measures to promote climate action by implementing close-to-nature forestry in return for a premium called "*Klimabonusbës*ch". This premium is only available for private forests. The aim is to preserve the many services that forest ecosystems offer to society, such as soil protection, water and air filtration, preservation of biodiversity and a recreational or ecological tourism environment, carbon dioxide capture and the supply of natural products such as wood. It also helps to adapt forests to the effects of climate change and contributes to the implementation of the PNEC. The premium is intended to reward private forest owners who provide the vital services that forests offer to society as a whole through sustainable forest management.

Participation in International Climate Finance (ICF)

On a per capita basis, Luxembourg is one of the largest public ICF donors in the world. For the period 2014-2020, Luxembourg has made available €120 million for mitigation, adaptation and land use

¹¹⁰ Please also note the measures outlined under Objectives 7 and 12.

¹¹¹ Strategy for adapting to the effects of climate change: https://environnement.public.lu/fr/actualites/2018/juin-2018/effets_changement_climatique.html

¹¹² Law dated 15 December 2020: <https://legilux.public.lu/eli/etat/leg/loi/2020/12/15/a994/jo>

¹¹³ Final report on greenhouse gas emissions for 2021: <https://environnement.public.lu/content/dam/environnement/fr/climat-energie/changement-climatique/os-climat-bilan-dfinitif-2021-mecdd-version-finale.pdf>

¹¹⁴ See: <https://environnement.public.lu/fr/klima-an-energie/opc.html>

(including reducing emissions from deforestation and forest degradation) in developing countries. Luxembourg nearly doubled its ICF envelope to €200 million over the period 2021-2025, and then raised it to €220 million at the Glasgow conference (COP26, November 2021). The funds linked to the ICF are new and additional funds. They are made available by Luxembourg on top of its official development assistance, which was equivalent to about 1% of gross national income in 2020.

Long-term low greenhouse gas development strategy (October 2021)

In October 2021, the government adopted a long-term national climate action strategy which sets out the strategic vision and identifies the guidelines and key policy areas and measures for a successful transition to climate neutrality. It will serve as a guideline for national climate policy up to 2050 as agreed in the coalition agreement 2018-2023.

Accordingly, the following guiding principles will pilot the transition to climate neutrality in Luxembourg:

1. Exploit the potential for reducing anthropogenic GHG emissions so that only residual, unavoidable emissions need to be compensated for by removals
2. Socially just transition: leaving no one behind
3. Economically efficient and financially sustainable transition: preserving or even improving Luxembourg's competitiveness, while ensuring sustainable sound and balanced public finances at all times
4. Involve society and economic actors in the design of the transition
5. Integrated approach: fostering an approach that respects the sustainable development objectives of the 2030 Agenda, while controlling administrative complexity
6. Clear, coherent and stable respectively predictable legislative and policy framework: ensure the coherence of the Luxembourg legislative and policy framework (including strategies, plans, instruments and investments) with the objective of climate neutrality
7. Enabling EU framework: working towards and taking advantage of an enabling EU framework that is essential for a successful transition from a small open economy to climate neutrality
8. Regional cooperation and with other Member States: cooperate in the Greater Region and with other Member States to improve the efficiency and speed of transition
9. Green finance: exploiting the assets of the Luxembourg financial market ecosystem to successfully finance the green transition on a national and global scale
10. Post-COVID-19 Green Recovery: using post-COVID-19 economic recovery programmes to accelerate the transition
11. Integrated environmental mitigation: not to act to the detriment of human health, biodiversity, air quality, water quality or other environmental components and to make the best use of co-benefits, particularly in terms of human health
12. Renunciation of the promotion of nuclear energy
13. Resilience enhancement: not harming, but enhancing the adaptive capacity and resilience of the natural environment to climate change

5. Use of structural funds

5.1. Complementarity, coherence and avoidance of double funding risks

The FEDER Managing Authority and the RRF Managing Authority meet regularly within the Concertation Committee (see below) to discuss the changes to the respective programmes but also to identify possible areas of complementary action or even risks of double funding.

However, it is worth noting that when submitting the Recovery and Resilience Plan to the European Commission, a list of eligible projects was submitted to the Commission. As FEDER projects only result from a public call for projects, it is relatively easy to identify projects with risks of double funding. Nevertheless, consultations between the two funds are useful to identify a project that might be complementary to an RRF project in a given region, for example.

The Ministry of Finance is in charge of coordination and implementation of aspects complementary to the Recovery and Resilience Facility (RRF). The Ministry of Finance has submitted its plan to the European Commission in accordance with the deadline set out in the EU regulation. The plan contains a set of coherent projects that will contribute to the post-COVID-19 recovery by focusing on the dual green and digital transition. On 18 June 2021, the European Commission adopted a positive assessment of the Luxembourg plan.

In order to maximise the potential of the various tools for supporting economic recovery, close coordination is taking place between the various national entities in charge of European funds. The RRF's principles of complementarity aim to ensure that for the reform and investment projects planned, the funds potentially in competition do not cover the same costs and that the projects are defined through precise identification. Several projects are complementary between the RRF and the FEDER, particularly in the fields of health, digitalisation and mobility. Concerning the fields of health and digitalisation, and compared to the RRF, the FEDER stands out rather by projects of an innovative nature and/or so-called "pilot" projects. In terms of mobility, the RRF intends to co-finance a project aiming at implementing 800 electric charging points for electric and hybrid cars mainly targeting companies, corporations and state equipment with low or zero emission vehicles, while the FEDER intends to finance the 100% electrification of sustainable and local public transport, in this case the TICE bus network (belonging to the municipalities of the South region).

5.2. Coordination with structural funds

Coordination between the NRP and the structural funds is necessary for the period 2021-2027 because the projects developed and supported by EU funding under the structural funds contribute to the implementation of a green, digital and inclusive transition.

Since the 2007-2013 programming period, a concertation committee has been set up, bringing together the managing authorities of European funds in Luxembourg. The committee meets regularly, quarterly or ad-hoc at the request of one of its members.

The objectives of this committee are to:

- Ensure complementarity between the various Community interventions in Luxembourg;
- Coordinate the development of priorities and specific objectives for each programme;
- Define clear distinctions between each fund to avoid the risk of double funding;
- Identify actions where closer collaboration would be beneficial;
- Organise and ensure frequent and necessary follow-up and exchange of information.

For the period 2021-2027, the consultation committee is composed of the following representatives:

- Ministry of the Economy (FEDER Managing Authority)
- Ministry of Labour, Employment and Social Economy (ESF Plus Managing Authority)
- Ministry of Agriculture, Viticulture and Consumer Protection (FEADER Managing Authority)
- Ministry of Energy and Spatial Planning (Managing Authorities of INTERREG programmes)
- Grand-Ducal Police (ISF and BMVI Management Authorities)
- Ministry of Foreign and European Affairs (AMIF Managing Authority)
- Ministry of Finance (RRF Management Authority)
- Inspectorate of Finance, in its capacity as Audit Authority

The members of the committee also consult each other on current issues and coordinate preparatory work in relation to the working groups held at European level (SMOR, COREPER, Inform EU, etc.).

In the context of the current developments (notably following the health crisis), representatives of the Ministry of Finance have joined the Concertation Committee to also cover the part related to new measures and initiatives such as the Recovery and Resilience Facility (RRF) and the Public Sector Loan Facility (PSLF).

Any project that could be financed either by the Just Transition Fund (JTF) or by the FEDER will be analysed and discussed at the "Concertation Committee", in order to identify potential opportunities for complementarities and to avoid any risk of double financing. This also applies to any project that may be financed by the European Social Fund+ (ESF Plus) and the RRF.

The distinction between the two funds is automatically ensured by the specificity of eligible activities according to Article 8 of Regulation (EU) 2021/1056.

It should also be noted that Luxembourg has a cohesion policy advisor seconded to the Permanent Representation of the Grand Duchy of Luxembourg to the EU.

5.3. Funding priorities for the period 2021-2027

The national FEDER programme

For the programming period 2021-2027, inter-institutional negotiations were continued and the Managing Authority agreed with the European Commission on the continuation of the investment policy and strategy: the focus will continue to be on research and innovation as well as on a sustainable and resilient economy. Accordingly, on 16 December 2022 the European Commission formally adopted its 2021-2027 programme.

The Luxembourg FEDER Operational Programme (OP) will include a Community budget of €19.7 million, including the Just Transition Fund which is included in the Operational Programme as a separate axis. The OP consists of four priority areas, as follows:

Table 13: Financial agreement by area (2021-2027)

Priority area (2021-2027)		TOTAL COST (in €)	FEDER contribution (in €)
Priority area 1	A more competitive and intelligent Europe	22,592,285.00	9,036,914.00
Priority area 2	A greener, more resilient and low carbon Europe	10,590,138.00	4,236,055.00
Priority area 3	Just Transition Fund	10,672,686.00	5,336,343.00
Priority areas 4 & 5	Technical assistance (OP and JTF)	2,562,719.00	1,069,557.00
TOTAL		46,417,828.00	19,678,869.00

Source: Ministry of the Economy

Priority area 1 aims to achieve a more competitive and intelligent Europe by fostering innovative and intelligent economic transformation and regional ICT connectivity and supports several specific objectives (SO1) such as:

- i. Developing and improving research and innovation capacities and the use of advanced technologies – (SO1 i)
- ii. Harnessing the benefits of digitalisation for the benefit of citizens, businesses, research organisations and public authorities – (SO1 ii)
- iii. Strengthening sustainable growth and competitiveness of SMEs and job creation in SMEs, including through productive investment – (SO1 iii)

Area 1 aims to develop competences in the following priority areas of the Smart Specialisation Strategy:

- Industry 4.0
- Health-Tech
- Information and Communication Technologies (ICT)
- Clean-Tech
- Research and Innovation

Priority area 2 aims to achieve a greener, more resilient and low-carbon Europe moving towards a net zero carbon economy, through the promotion of a clean and equitable energy transition, green and blue investments, circular economy, climate change mitigation and adaptation, risk prevention and management, and sustainable urban mobility through support entitled "Grant (code: 01)". It supports the achievement of the following specific objectives (SO2):

- i. promote energy efficiency measures and reduce greenhouse gas emissions (SO2 i)
- ii. promote renewable energy in line with Directive (EU) 2018/2001, including the sustainability criteria set out therein (SO ii)

Priority area 3 includes the Just Transition Fund. In view of the modest financial allocation, the FEDER and ESF managing authorities decided not to create a separate operational programme, but to each include a part of this new fund as a separate priority axis in the respective operational programmes. In close cooperation with the Ministry of Energy and Spatial Planning, which was responsible for drawing up the Territorial Just Transition Plan, defining the scope, it was decided to invest in the following areas:

- investments in the roll-out of affordable clean energy technologies, systems and infrastructure, including energy storage technologies, and in the reduction of greenhouse gas emissions
- investments in renewable energy in accordance with Directive (EU) 2018/2001 of the European Parliament and of the Council, including the sustainability criteria set out therein, and investments in energy efficiency, including for the purpose of reducing fuel poverty
- investments in smart and sustainable local mobility, including the decarbonisation of the local transport sector and its infrastructure

Finally, the last two priority areas concern Technical Assistance. The Regional Policy Directorate of the Ministry of Economy is the managing authority and manages the programme in its entirety. Technical assistance is placed under its authority. As in the previous programming period, the Managing Authority 2021-2027 is placed under the authority of a senior civil servant and currently consists of a total of two civil servants and two technical assistants. These provide support for the management, monitoring and implementation of the operational programme as well as for information and communication. They bring more than 12 years of professional experience in FEDER management. The central objective of technical assistance is to ensure the smooth implementation of the programme

by providing the Managing Authority with the resources to guarantee an efficient management process throughout the implementation period and to respond to the various requests for exchanges and transmission of data requested by the European Commission in accordance with Article 36 of Regulation (EU) No 2021/1060. The implementation of previous programmes has demonstrated the importance of allocating sufficient budgetary, technical and IT resources to the programmes, as well as staff resources for the collection of project progress data, the dissemination of information and providing assistance and support to beneficiaries. These resources should in particular make it possible to consolidate the management, coordination and information actions to be implemented for this programme.

The types of actions managed by FEDER technical assistance are listed below:

- Support for institutional and administrative capacity building to ensure the effective management of the Operational Programme.
- Assistance for project preparation and evaluation.
- Studies related to the preparation of the Commission's reports under the OP.
- Measures necessary for analysing, managing, monitoring, exchanging information and implementing the OP, as well as those relating to the implementation of control systems and technical and administrative assistance.
- Development, operation and interconnection of computerised management, monitoring, audit, control and evaluation systems.
- Actions related to audits.
- Evaluations, expert reports, statistics and studies, including those of a general nature, relating to the current and future operation of the OP.
- Improvement of evaluation methods and exchange of information on evaluation practices - implementing a new FEDER website, e-Cohesion system and database.
- Launch of several calls for applications for FEDER projects in the print media and on the Internet.
- Launch of several publicity and communication campaigns - announcements, conferences, distribution of publicity articles, etc.
- Support for measures to combat fraud and corruption.

The FEDER national programme 2014-2020

Implementation of the "Investment for Growth and Employment" programme (2014-2020)

One year after the entry into force of the various cohesion policy regulations, the European Commission approved the FEDER Operational Programme for the period 2014-2020 on 15 December 2014. The FEDER Operational Programme, with a budgetary allocation of €19.5 million and an estimated total cost of €48.2 million, splits its focus equally on two thematic objectives: strengthening research, technological development and innovation and the transition to a low-carbon economy across all sectors, in line with the objectives set out in Regulation (EU) 1303/2013 and closely linked to the objectives of the Europe 2020 strategy.

In accordance with the above referenced regulation, the Managing Authority is responsible for the implementation of the Integrated Territorial Investment (ITI) instrument. Thus, the City of Dudelange was designated as an "Intermediate Body", on the recommendation of the auditing body (Inspectorate of Finance) by ministerial decision in December 2016, whose delegation of competence was limited to the selection of ITI operations only, with a budget set at €1.2 million. The City of Dudelange has selected two projects as part of its urban strategy: "Validation of the deep geothermal potential in Dudelange by medium-depth drilling" and "Development of a Shared Space, Niddeschgaas in Dudelange".

As of 31 December 2022, 26 projects have been selected and approved.

Table 14: Financial agreement by area (2014-2020)

Priority areas (2014-2020)		TOTAL COST (in €)	FEDER contribution (in €)
Priority area 1	Boost research, technological development and innovation a. Improve research and innovation (R&I) infrastructure b. Foster corporate investment in R&I	24,183,851.56	9,673,540.62
Priority area 2	Support the transition to a low-carbon economy a. Promote the production and distribution of energy from renewable sources b. Increase energy efficiency and the use of renewable energy in public infrastructure c. Support low-carbon development strategies, including the promotion of sustainable multimodal urban mobility	27,100,448.71	10,094,579.49
Technical assistance	Technical assistance to the programme	2,340,288.00	1,170,144.00
TOTAL		53,624,588.27	20,938,264.11

Source: Ministry of the Economy

The REACT-EU programme

In tandem with the 2014-2020 programming period, the FEDER Managing Authority is in charge of implementing the REACT-EU programme until 2023. On 23 December 2020, the Council and the European Parliament adopted the proposal for a regulation on REACT-EU (Supporting Recovery in Europe's Cohesion and Territories). This initiative extends and complements the crisis response measures implemented under the Coronavirus Response Investment Initiative (CRII) and CRII+. REACT-EU has allocated €139.8 million to Luxembourg for the years 2021 to 2023 and is managed by the European Regional Development Fund (FEDER), the European Social Fund (ESF), and the European Fund for Assistance to the Most Deprived (FEAD). The funds allocated to Luxembourg under REACT-EU will be used to co-finance the short-time working scheme, the costs related to the vaccination against COVID-19 and the initiatives promoting the green transition.

On 8 April 2022, the Ministry of Economy signed conventions for the COVID-19 vaccination and the redesign of the RGTR bus network, including the acquisition of electric buses, with the Ministry of Health and the Ministry of Transport, respectively. The REACT-EU contribution for each of the two projects amounts to approximately €35.0 million.

The amount allocated to the FEDER led to the creation of a new strand in its Operational Programme, which was amended in the last quarter of 2021. The Monitoring Committee formally approved the modification on 10 December 2021 and it was finally adopted by the European Commission on 3 February 2022.

At the end of 2021, an additional tranche of €3.9 million was allocated to Luxembourg, which will be used to co-finance the short-time working scheme.

Up to 31 December 2022, the FEDER Managing Authority declared and paid an amount of €23,016,122.61 for the COVID-19 Vaccination project. The revised expenditure relates to the acquisition of vaccine doses and financing the Helpline set up by the Ministry of Health.

On 26 January 2023, the FEDER authority presented the progress of the operational programme at its annual monitoring committee meeting and analysed the financial data and performance indicators. At the end of this presentation, the Monitoring Committee, which was attended by the European Commission as an observer, gave its approval for the revised financial year.

ESF and ESF Plus: A labour market for all, also for the most vulnerable

For the European Social Fund (ESF), which has been in existence since 1957 and is the EU's main financial instrument investing in human capital, the year 2022 has been a pivotal one. The old programming period 2014-2020 is coming to an end and the new period 2021-2027 has just started in 2023 with a first call for projects which was launched from 13 January to 26 March 2023.

The current ESF will expire on 30 June 2023: This programme (2014-2020) aimed at fighting unemployment, in particular youth unemployment, by enhancing the skills and competences of young people and job-seekers - in particular those with a migrant background - and by seeking a better match between supply and demand in the labour market. It has improved equal access to lifelong learning for all age groups, to help keep older workers in the labour market longer. It also provided support for the social inclusion of vulnerable people.

A total of 105 projects have been implemented through EU and Luxembourg co-financing for a total amount of more than €113 million including REACT-EU funds.

The new ESF Plus programme "Investing in the future" was formally adopted on 14 December 2022. It is in line with the strategic objective of a social Europe implementing the European social rights base and responds with its total budget of €43.77 million to various challenges identified as follows:

- The fight against unemployment with a particular focus on the 45+ population, the long-term unemployed and young people
- Support for the social and solidarity economy
- Promoting lifelong learning and adapting skills to change
- The implementation of activation measures for people at a disadvantage who are very alienated from the labour market
- The integration of the population resulting from the migratory crisis, in particular by providing access to employment, education and training
- Support to the Child Guarantee for vulnerable children
- Tackling material deprivation
- Support for people who are or will be facing employment consequences arising from the transition to the EU's specific 2030 energy and climate targets and to a climate neutral EU economy by 2050

Just Transition Fund (JTF 2021-2027)

The Just Transition Fund (JTF), which is one of the pillars of the Just Transition Facility, is a new financial instrument under the cohesion policy for 2021 to 2027. Its main objective is to support the regions hardest hit by the negative effects of the transition to climate neutrality. In Luxembourg, the JTF will be implemented through the FEDER and ESF Plus programmes, which each have a priority area dedicated to the JTF. The Grand Duchy of Luxembourg's national allocation to the JTF amounts to a total of approximately €9.2 million, with approximately 60% of the resources allocated to the FEDER and approximately 40% to the ESF Plus. The objectives as well as the region and the types of eligible projects (in line with the eligible sectors) are determined by the Territorial Plan for Just Transition (PTTJ), which was developed by the Department of Spatial Planning of the Ministry of Energy and Spatial Planning in close cooperation with the Ministry of Economy and the Ministry of Labour,

Employment and Social and Solidarity Economy. In order to address the challenges of transition and build resilience in the 11 municipalities of the Southern Region, the initial focus of the PTTJ will be to mitigate the costs of upgrading the transforming sectors, to fight fuel poverty and to facilitate sustainable local mobility; it will then provide support to workers through training. The PTTJ was approved as an annex to the FEDER and ESF Plus operational programmes in December 2022.

European territorial cooperation programmes (Interreg) (2021-2027)

The "European territorial cooperation" objective of the European Regional Development Fund (FEDER) is broken down into different programmes that aim to strengthen territorial cohesion by reducing the economic and social disparities that exist between European regions. During the 2021-2027 programming period, Luxembourg will participate in six of the European territorial cooperation programmes often grouped under the designation "Interreg programmes", including one cross-border programme (Interreg Grande Région), one transnational programme (Interreg North-West Europe) and four interregional programmes (Interreg Europe, ESPON, URBACT, Interact). All of these programmes have been approved and began implementation in the course of 2022.

Interreg Greater Region 2021-2027

The Interreg Greater Region (GR) programme (2021-2027) was adopted by the European Commission on 7 October 2022 with a budget of approximately €182 million of FEDER:

The programme partners are:

- The government of the Grand Duchy of Luxembourg (LU)
- The Wallonia region (BE)
- The Wallonia-Brussels Federation (BE)
- The German-speaking Community of Belgium (BE)
- The Prefecture of the Grand-Est Region (FR)
- The Grand-Est Region (FR)
- The Department of Moselle (FR)
- The Department of Meuse (FR)
- The Department of Meurthe et Moselle (FR)

It focuses on four priorities with 11 specific objectives.

Table 15: Specific priorities and objectives - Interreg Greater Region 2021-2027

Priority	Specific objective
A greener Greater Region	Promote climate change adaptation and disaster risk reduction, resilience, taking into account ecosystem-based approaches.
	Promote the transition to a circular and resource efficient economy.
	Strengthen the protection and preservation of nature, biodiversity and green infrastructure, including in urban areas, and reduce all forms of pollution.
A more social-oriented Greater Region	Strengthen the efficiency and integration of labour markets and access to quality jobs through the development of social infrastructure and the promotion of the social economy.
	Improve equal access to inclusive and quality services in education, training and lifelong learning by developing accessible infrastructures, including the resilience of education and e-learning.
	Ensure equal access to health care and promote the resilience of health systems, including primary care, and promote the shift from institutional to family and community-based care.
	Strengthen the role of culture and sustainable tourism in economic development, social inclusion and social innovation.

A Greater Region closer to its citizens	Promote integrated and inclusive local social, economic and environmental development, culture, natural heritage, sustainable tourism and safety in non-urban areas.
Better governance of cross-border cooperation in the Greater Region	Contribute to the efficiency of public administration by promoting legal and administrative cooperation as well as cooperation between citizens, civil society actors and institutions, in particular with a view to overcoming legal and other obstacles in border areas.
	Strengthen mutual trust, including by promoting people-to-people actions.
	Implement other actions to support better governance of cooperation

The new programme will implement some innovations compared to the previous period. In particular, the programme will finance nine functional areas later on, with a total financial volume of approximately €41 million.

Interreg North-West Europe (NWE) 2021-2027

The Interreg North-West Europe (NWE) 2021-2027 programme was adopted by the European Commission on 24 August 2022 with a budget of approximately €310 million of FEDER. It brings together all the regions of Belgium, Ireland, Luxembourg, the Netherlands and Switzerland as well as parts of Germany and France.

The Interreg NWE 2021-2027 programme jointly aims to promote a green, smart and just transition for all NWE territories in order to support a balanced development and make all regions more resilient. It focuses on five priorities with nine specific objectives.

Table 16: Specific priorities and objectives - Interreg North-West Europe (NWE) 2021-2027

Priority	Specific objective
Climate and environment	Promote climate change adaptation and disaster risk reduction and resilience taking into account ecosystem-based approaches.
	Improve the protection and preservation of nature, biodiversity and green infrastructure, including in urban areas, and reduce all forms of pollution.
Energy transition	Promote energy efficiency and reduce greenhouse gas emissions.
	Promote renewable energy in line with Directive 2018/2019, including the sustainability criteria set out therein.
Circular economy	Promote the transition to a circular and resource-efficient economy.
Innovation and resilience	Develop and strengthen research and innovation capacities and the adoption of advanced technologies.
Inclusive society	Strengthen the efficiency and inclusiveness of labour markets and access to quality jobs by developing social infrastructure and promoting the social economy.
	Ensure equal access to health care and promote the resilience of health systems, including primary care, and promote the transition from institutional to family and community care.
	Strengthen the role of culture and sustainable tourism in economic development, social inclusion and social innovation.

For the new programming period, Luxembourg is not only represented by representatives of the Department of Spatial Planning (DATer) of the Ministry of Energy and Spatial Planning (National Authority) and the Ministry of Economy, but also by a representative of the municipal association *Syndicat des Villes et des Communes du Luxembourg* (SYVICOL).

Interreg Europe 2021-2027

The Interreg Europe 2021-2027 programme was adopted by the European Commission on 5 July 2022, with a budget of €379 million. It includes the 27 Member States, Switzerland and Norway.

Under the policy priority "Better governance of cooperation", the programme targets all thematic areas of the structural and investment funds for the period 2021-2027.

As in the previous programming period, the Interreg Europe 2021-2027 programme promotes the exchange of experience across Europe using two different tools:

- Cooperation projects¹¹⁵
- Policy Learning Platform¹¹⁶

Interact IV

The Interact IV inter-regional cooperation programme was adopted by the European Commission on 27 July 2022 with a total budget of around €56 million. It covers the 27 Member States as well as Norway and Switzerland and also pre-accession projects and programmes in the European Neighbourhood countries. The objective of the programme is to ensure the exchange of experience, information and innovation in order to promote best practice and facilitate cooperation between programmes falling under the European territorial cooperation objective of cohesion policy.

ESPON 2030

The ESPON 2030 Interregional Cooperation Programme was adopted by the European Commission on 6 July 2022 with a total budget of approximately €60 million. It encompasses the 27 Member States, Switzerland, Liechtenstein, Norway and Iceland. The objective of the programme is to establish a regional observation network at European level and to provide policy makers at all levels with new knowledge on the territorial impacts of the sectors' policies and regional trends in order to strengthen territorial cohesion in Europe.

URBACT IV

The URBACT IV inter-regional cooperation programme was adopted by the European Commission on 19 September 2022 with a total budget of approximately €108 million. It involves the 27 Member States, Switzerland and Norway. The objective of the programme is to promote integrated sustainable urban development in European cities by facilitating the exchange of experience and the transfer of good practice through transnational networks.

¹¹⁵ See: <https://www.interregeurope.eu/projects/>

¹¹⁶ See: <https://www.interregeurope.eu/policylearning/>

6. Institutional issues and the role of stakeholders

6.1. National ownership

With a view to increasing transparency and encouraging national ownership, the government closely involved Parliament and social partners:

- The government presented the National Reform Programme (NRP) and the Stability and Growth Programme (SGP) to the Chamber of Deputies before submission to the European Commission at the end of April 2023.
- The social partners have been involved in the national social dialogue.

The government and the social partners regularly exchange views in the framework of the European Semester and the Tripartite Coordination Committee. The last exchange in the framework of the 2022 cycle of the European Semester between the government and the social partners, which took place in June 2022, focused on the 2022 Country Report and the European Commission's proposals for specific recommendations 2022-2023 for Luxembourg. In order to prepare the first meeting of the 2023 cycle of the European Semester, which is scheduled to take place before the NRP and SGP are sent to the European institutions, the social partners drew up a common position which they submitted to the government on 29 March 2023.¹¹⁷ This position includes in particular a joint opinion on the national governance of social dialogue in the European framework, on the responses to the energy crisis, as well as on the 2022-2023 country-specific recommendations of the European Council.

1. National governance of social dialogue in the context of the European Semester

The social partners note that the government has responded positively to a reformed procedure at national level proposed by the social partners in 2022.

In a context of an uncertain environment with persistently high inflation, in early March 2023 the government and the social partners held consultations in the framework of the Tripartite Coordination Committee in order to respond to current challenges. Unfortunately, calendar constraints made it impossible to maintain the schedule of meetings planned for the beginning of the year in the framework of the European Semester.

2. National and European response to the energy crisis

The social partners address the REPowerEU with reference to the measures taken under the "Energiedësch" (February 2022), the "Solidaritéitspak 1.0" (March 2022) and the "Solidaritéitspak 2.0" (September 2022).

3. European Council recommendations for Luxembourg

The social partners emphasise their general observation that too often the Council's recommendations do not take sufficient account of the specific national characteristics and socio-economic reality of Luxembourg. The social partners believe that the structural problems of the country, as identified in their common position (section 5.5), must be addressed.

The social partners consider that the Council's recommendations in 2021 on the management of the COVID-19 pandemic have been relatively well addressed by the government.

In response to recommendation 1 for the period 2022-2023, on short- and long-term fiscal policy, the social partners emphasise maintaining a well-functioning economy and increasing public investment

¹¹⁷ The joint position of the social partners can be found in the appendices to the original version in French of the NRP 2023. Programme national de réforme du Grand-Duché de Luxembourg 2023, <https://odc.gouvernement.lu/dam-assets/publications/rapport-etude-analyse/programme-national-de-reforme/2023-pnr-luxembourg/2023-pnr-luxembourg-fr.pdf>

in ecological and digital transitions as well as energy security. Concerning the measures adopted to combat aggressive tax planning, the social partners are of the opinion that Luxembourg complies with all legislation in this area and that the current government is resolutely promoting transparency.

They do not take a specific position on Recommendation No. 2 on the implementation of the Recovery and Resilience Plan, namely a horizontal recommendation for all Member States. They refer to their position taken in the 2021 round and consider the allocation of the Recovery and Resilience Facility for Luxembourg as relatively low.

With regard to recommendation No. 3, the social partners put forward numerous challenges and demands relating to the education system, particularly in relation to the guidance and pedagogical missions of education, the dual digital and sustainable transition with which schools are confronted, school failure, vocational and continuing training, higher education, as well as professionalization in companies.

As for recommendation No. 4 on reducing the country's dependence on fossil fuels and promoting sustainable transport, the social partners share the importance of promoting investments in the green and energy transition, for example in the development and deployment of clean technologies, in ecological aid based on social criteria and in ambitious training and retraining programmes, as well as pursuing fair ecological taxation.

Finally, the social partners are surprised that some issues that they consider very important have not been addressed in the specific recommendations of the Council 2022-2023 for Luxembourg. These include housing, health, social inequalities and the digital transition, as well as cross-border issues and the Greater Region.

6.2. Communication

Diverse studies have shown that the resistance that forms to structural reforms is linked to the fact that uncertainty regarding expected future benefits of reforms is often greater than the uncertainty regarding costs incurred. The government attaches particular interest to this challenge and intends to pursue its efforts.

In order to monitor the evolution of its economic, social and environmental performance and to compare itself with other EU Member States, Luxembourg has its own system of indicators. This national scoreboard, which considers competitiveness in a broad sense, was initially developed in the framework of the Lisbon Strategy. In view of the fact that some of the structural indicators used for the quantitative monitoring of this strategy did not take sufficient account of Luxembourg's national specificities, the Tripartite Coordination Committee considered in 2003 that it would be appropriate to publish an annual national competitiveness scoreboard. The Competitiveness Observatory of the Ministry of the Economy (ODC) is in charge of updating the scoreboard. After some occasional adaptations of the indicators used, in particular to integrate the objectives of the Europe 2020 strategy, it was decided to review the scoreboard in its entirety after ten years of use. Since its overhaul in 2016, prepared in close cooperation by the ODC and the Economic and Social Council, the national indicator system is based on the three pillars of sustainable development, namely the economic, social and environmental aspects. In the current edition, published in December 2022, Luxembourg remains among the most competitive countries in the EU and occupies the 7th position in the overall ranking. In more detail, the country is ranked 7th for the economic aspect, 4th for the social aspect and 7th for the environmental aspect.¹¹⁸

¹¹⁸ Observatoire de la compétitivité, Le système d'indicateurs national - édition 2022, <https://odc.gouvernement.lu/fr/publications/rapport-etude-analyse/perspectives-politique-economique/ppe-038.html>



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