



LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG

National plan for smart, sustainable and inclusive growth

Luxembourg 2020

National Reform Programme
of the Grand Duchy of Luxembourg under the European semester
2020



English courtesy translation of the original document (in French)

Foreword

The preparation of the 2020 National Reform Programme (NRP) started at the beginning of the year. Outlining the Government's strategy to respond to the major challenges of the Luxembourg economy, the NRP fits into the European semester and serves as a basis for discussions to be held with the European Commission on the efforts made by Luxembourg to guide its development. The NRP was enriched this year by assimilating not only economic, social and environmental objectives, but also through its integration of the sustainable development goals. This was implemented to make the NRP an instrument for integrating economic policies and to provide a longer-term view of the challenges that lie ahead.

In March 2020, this agenda was completely disrupted by a health and economic crisis of unprecedented magnitude. The gradual spread of the Covid-19 Coronavirus all over the world has forced the vast majority of countries to drastically restrict social contacts amongst their citizens and, above all, to abruptly halt a large part of the economic activity. A health crisis that results in a large number of deaths has now resulted in an economic crisis of unprecedented scope.

At the time this document was to be finalized, the Member States of the European Union began to implement strategies for lifting restrictions and gradually restart activities that have been at a standstill, revive their economies and to partially restore liberties to citizens who have been confined for weeks. Once restrictions are lifted, we cannot however expect a return to what we considered normal beforehand. The Coronavirus will remain present for many more months and our society will have to adapt to a new mode of operation to combine the imperatives of the health crisis, in particular with regard to the capacities of hospitals and regarding the need to jump-start and support the economy.

The measures and decisions taken by the Government, namely the stabilisation plan for the economy, aim to mitigate the social and economic consequences of the crisis in the short term. However, it will also require action over the long-term. The aftereffects of this crisis will bring on the need for reconstruction. This will be an opportunity to rethink our society and to foster another model of prosperity that promotes improved economic resilience to crises like the one brought on by Covid-19.

The importance of the health system also became particularly visible during this crisis. In particular, health infrastructure will need to be further developed in order to be able to counter possible future crises. Similarly, it is important to encourage strengthening a broad base of health personnel.

Each crisis brings its share of lessons to be considered in the future, so as to elicit the correct reaction for proper daily functioning.

The NRP, in conjunction with the SGP (Stability and Growth Programme), will therefore have to evolve over the next few years to account for a vision of a future that will not be identical to the pre-crisis situation. The basic objective of achieving sustainable development is in no way called into question. However, certain priorities must be adapted and planning the way to achieve resilient and sustainable economic growth concerns all of us. Such development is essential as a future basic principle for all political, economic and ecological action.

The Government had already paved the way with its 2017 embrace of the strategy of the Third Industrial Revolution, developed collaboratively under the aegis of the economist Jeremy Rifkin, as a general orientation for the economic development of the country. Subsequently, the many reflections and ideas born from this broad conceptualization effort made their way into the different ministerial departments. Today, the reflections in the Rifkin report remain more relevant than ever. A way to emerge from the crisis toward economic recovery should be based on these scenarios to start a digital, intelligent and sustainable society.

The current crisis has spurred a blatant digitalization trend. Digitization is a key strategic axis that both increases the productivity of available resources and reduces environmental impacts. To ensure proper development, digital infrastructures will themselves have to reduce their environmental footprint by using the best possible technologies in terms of energy efficiency and renewable energies. In addition, digitalization is also playing an increasingly important role in health fields such as the public health system; one example of this is the development of remote consultations.

The European Council, the European Parliament and the European Commission recently agreed on two overlapping key ambitions and priorities of the European Union: the transition to climate neutrality by 2050 and the need to take the lead in assimilating the digital revolution within an increasingly digital economy and society. Luxembourg's Government fully supports these ambitions. The challenge now is to develop policy measures and a regulatory framework that will enable the government to act. Luxembourg should be one of the first countries to adopt a vision combining a digital strategy and the Green Deal.

The crisis has also highlighted the importance of flexible and resilient strategic value chains for the economic stability of the European Union. The digital transformation of the Luxembourg economy and in particular of its industrial fabric offer a unique opportunity to build production capacities and resilient value chains in its strategic economic sectors as the country gradually emerges from the Covid-19 crisis.

In addition, the Covid-19 pandemic demonstrated that the internal market at community level failed to remain fully functional during the Covid-19 crisis. Border closures, ad hoc supply difficulties, the need to set up specific channels to ensure the shipment of goods within the European Union testify to certain shortcomings. For Luxembourg in particular, certain border closings posed major challenges: the flow of essential deliveries and the free movement of cross-border workers, who represent 46% of total domestic payroll employment, were hampered or restricted. Maintaining cross-border flows is vital for the Grand Duchy and therefore it is crucial that the single market is consolidated in order to avoid disrupting intra-community flows of people, goods and services.

Regional coordination will become more important in the future. Close consultation with the border regions should lead to concentrating selected value chains within the Greater Region and consolidating them, for the benefit of all the countries concerned.

ACRONYMS

ADEM	Employment Development Agency
AI	Artificial Intelligence
ALJ	Local Youth Action
ASBL	Non-Profit Organisation
BTS	Vocational Training Certificate
CEFN	National Economic and Financial Committee
CePAS	Psycho-Social and Scholastic Assistance Centre
CIEDD	Inter-Ministerial Committee on Education for Sustainable Development
CIP	Professional Initiation Classes
CNCD	National Council for Sustainable Construction
CNFPC	National Centre for Continuous Vocational Training
CNP	National Productivity Board
CRP	Public Research Centre
DESI	Digital Economy & Society Index
DSGE	Dynamic Stochastic General Equilibrium
EFT	ESF European Social Fund
ENAD	National School for Adults
ERA	European Research Area
ERDF	European Regional Development Fund
ESC	Economic and Social Council
ESF	European Social Fund
ETS	Emission Trading Scheme
EU	European Union
FEAD	Fund for European aid to the most deprived
FEDIL	Federation of Luxembourg Industrial Operators
FNR	National Research Fund
FNS	National Solidarity Fund
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GIE	Economic Interest Group
GNI	Gross National Income
HPC	High Performance Computing
ICT	Information and Communications Technologies
IFEN	Institute of National Education Training Programmes
IFSB	Institute for Training in the Construction Industry
IGSS	General Inspectorate of Social Security
INAP	National Institute for Public Administration
INFPC	National Institute for the Development of Continuing Vocational Training
IPIL	Institute of Intellectual Property
KTOE	Kilo-tonne oil equivalent
LENOZ	Luxembourg Sustainability Certificate for Residential Buildings
LIH	Luxembourg Institute of Health
LIS	Luxembourg income study
LISER	Luxembourg Institute of Socio-Economic Research
LIST	Luxembourg Institute of Science and Technology
LLL	Lifelong learning
LSA	Luxembourg Space Agency
LSM	Luxembourg structural model
MECDD	Ministry of the Environment, Climate and Sustainable Development
MENJE	Ministry of National Education, Childhood and Youth
MIP	Macroeconomic Imbalance Procedure
MODU	Sustainable Mobility Strategy
MTO	Medium-Term Objective

NECP	National Energy and Climate Plan
NEET	Not in education, employment or training
NRP	National Reform Programme
NZEB	Nearly zero-energy buildings
OECD	Organisation of Economic Cooperation and Development
ONIS	National Office for Social Inclusion
PAEE	National Energy Efficiency Action Plan
PAG	General Development Plan
PAN	National Action Plan
PDAT	Master Programme for Spatial Planning
PNDD	National Plan for Sustainable Development
PPB	Draft budgetary plan
PPP	Public-Private Partnership
PSL	Sector Housing Plan
R&D	Research and Development
R&I	Research & Innovation
RDl	Research-Development-Innovation
REVIS	Social Inclusion Income
RPGH	Severely Disabled Persons Allowance
SCP	Stability and Convergence Programmes
SCRIPT	Technological Innovations Coordination Service
SDG	Sustainable Development Goals
SePAS	Psychosocial and Scholastic Assistance Service
SEQE	Emission Trading Scheme
SME	Small and Medium-sized Enterprise
SNCI	National Credit and Investment Institution
SNHBM	National Affordable Housing Company
SSM	Minimum wage
STATEC	National Institute of statistics and economic studies
STEM	Science, Technology, Engineering and Mathematics
TIR	Third Industrial Revolution
UEL	Union des entreprises luxembourgeoises (Employer's Organisation)
VAT	Value Added Tax
VSE	Very Small Entity

TABLE OF CONTENTS

1. Introduction	8
2. Background and macroeconomic aspects	11
2.1 Developments in the Covid-19 pandemic and main economic policy measures.....	11
2.2 Macroeconomic perspectives for the period covered by the programme	23
2.3 Macroeconomic impact of structural reforms	25
3. Political responses to the major economic challenges	28
3.1 Implementation of country specific recommendations for 2019-2020	28
3.1.1 Employment rate of older people and long-term sustainability of the pension system.....	28
3.1.1.1 Employment rate of older people	28
3.1.1.2 Long-term sustainability of the pension system	29
3.1.2 Regulated professional business services	31
3.1.3 Economic policy linked to investment.....	32
3.1.3.1 Digitalisation and innovation.....	33
3.1.3.2 Skills development	37
3.1.3.3 Sustainable transport	38
3.1.3.4 Housing supply	40
3.1.4 Tax system	41
4. Progress achieved in national objectives for the Europe 2020 strategy	43
4.1 The Employment objective and the key measures for achieving it	44
4.1.1 National target	44
4.1.2 Key measures	44
4.2 The R&D objective and the key measures for achieving it.....	46
4.2.1 National target	46
4.2.2 Key measures	47
4.3 The Climate change and energy objective and the key measures for achieving it	52
4.3.1 Greenhouse gas emissions objective	54
4.3.1.1 National target	54
4.3.1.2 Key measures	56
4.3.2 Renewable energies objective.....	59
4.3.2.1 National target	59
4.3.2.2 Key measures	59
4.3.3 Energy efficiency objective.....	61
4.3.3.1 National target (final energy use).....	61
4.3.3.2 Key measures	61
4.4 The Education objective and the key measures for achieving it.....	63
4.4.1 Early school leavers objective	63
4.4.1.1 National target	63
4.4.1.2 Key measures	63
4.4.2 Tertiary education objective	66
4.4.2.1 National target	66
4.4.2.2 Key measures	66
4.5 The social inclusion objective and key measures for achieving it.....	67
4.5.1 National target	67
4.5.2 Key measures	68
5. Use of Structural Funds.....	72
5.1 Coordination with structural funds.....	72
5.2 Financing priorities for the period 2014-2020	73
5.3 Investment Guidance on the Just Transition Fund 2021-2027 for Luxembourg.....	73
6. Institutional issues and the role of stakeholders	75
6.1 National ownership	75
6.2 Communication	75

1. Introduction

In 2019, the **European economy** had experienced its seventh consecutive year of growth. At the start of 2020, forecasts estimated that the economy would continue to develop in 2020 and 2021 and maintain on a regular path of moderate growth. Despite a difficult external environment, the European economy should therefore have kept on track.

However, the Coronavirus pandemic (COVID-19) suddenly appeared, rendering an already difficult external environment in early 2020, with risks such as geopolitical instability and commercial uncertainties looming on the horizon, even more complex. This pandemic, an unprecedented event that causes a great deal of human suffering, led to the third major economic, financial and social crisis of this century. This crisis is here and has appeared where we did not expect it.

In order to minimize the number of deaths and the harmful effects of the disease on human health, the Luxembourg government decided in March 2020 to limit travel and professional activities, and to restrain all non-essential activities. These far-reaching restrictions affect people, businesses and the economy as a whole. Although the pandemic is first and foremost a health threat to citizens and workers, it also exerts an inevitable and very broad impact on the economy. In addition to focusing on public health measures, it is equally important to stabilize the economy and save jobs. Attention here is directed only on economic policy measures. The government very quickly made some important decisions complementing the measures taken at EU level in order to support and stabilize the national economy as well as to limit the negative fallout during this crisis. On 25 March 2020, the government presented the “Stabilisation programme”. This programme’s scope hovers around 14% of GDP and aims to support businesses in four areas: meeting immediate liquidity needs, coping with cash flow difficulties, facilitating corporate borrowing through government support and keeping people employed¹. The various measures taken against the COVID-19 pandemic and the resulting economic crisis will be described in Chapter 2.1 of this document. This chapter takes into account the measures taken in mid-April 2020 that may be subject to change as deemed necessary.

Besides these temporary measures to minimise the negative effects of the crisis, to which Luxembourg devotes absolute priority and all its attention, there remain significant challenges of a structural nature. Accordingly, the EU must also do more to tackle the longer-term challenges facing the economy. Climate and environmental concerns, technological progress and demographic change are bound to transform our societies in depth. The EU must therefore react to these changes by making sustainability the core focus in the coming years, which should contribute to implementing the Sustainable Development Goals (SDGs) that have been integrated into the European Semester, focusing on aspects related to the economy and employment.

¹ See chapter 2.1 on economic policy measures in the context of the COVID-19 pandemic in Luxembourg

Figure 1: United Nations 2030 Agenda SDGs (2015)



Source: Luxembourg 2030, Third National Plan for Sustainable Development (12/2019)

For Luxembourg, a small open economy integrated into a large cross-border area, the strong quantitative growth of the past constitutes a real challenge to overcome because this growth generates a certain number of negative externalities. Luxembourg is faced with a number of challenges, including mobility, access to housing, social cohesion, long-term sustainability of public finances, climate and environmental commitments, as well as economic diversification and the slow development of its productivity.

The National Reform Programme (NRP) addresses these factors and challenges in the medium and long term. This NRP provides an overview of the implementation of the measures announced previously and takes into account the Council's 2019-2020 recommendations and the national objectives for 2020. It also addresses the main conclusions contained in the country report for Luxembourg² that the European Commission published in February 2020. Finally, this NRP also takes into account the priorities of the new 2020 annual sustainable growth strategy published in December 2019 and as such can help steer these policies towards the SDGs by monitoring progress achieved and closer coordinating of efforts at the national level. In this context, it is useful to recall that at the end of 2019, the government approved the Third National Plan for Sustainable Development (PNDD)³, which is the main instrument for implementing SDGs in Luxembourg. The PNDD makes the link between national policy and Luxembourg's commitments at the international level and puts the ten priority fields of action that Luxembourg has identified in direct relation to the challenges facing the country.

On the macroeconomic level, Luxembourg is again among the EU Member States not subjected to an in-depth review under the alert mechanism of the Macroeconomic Imbalances Procedure (MIP).

On the microeconomic and employment side, education and training, R&D and innovation, efficient use of resources, social cohesion and inclusion and gender equality as a cross-functional goal, continue to act as the structural pillars of long-term growth. Since 2016, a series of events related to qualitative growth have been organised in Luxembourg. The government presented the Third Industrial Revolution (TIR) strategic study commissioned to Jeremy Rifkin. This study was chosen as a general guideline for the future development of the country. In order to stimulate the transition to a model of sustainable and inclusive economic growth, the government continues to ponder the issues of diversification, productivity, real and perceived level of well-being and the integration of new technologies, notably digitalization. Luxembourg has a solid foundation from which to respond to future challenges, as significant efforts have been made in ICT, logistics and energy. It is now a question of accelerating the dynamic forces and preparing their convergence in a digital and intelligent

² For more details see: <https://eur-lex.europa.eu/legal-content/FR/TXT/PDF/?uri=CELEX:52020SC0515&from=EN>

³ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2019/12-decembre/20-conseil-gouvernement.html

network. In addition, the government has set up a National Productivity Board (*Conseil national de la productivité, CNP*)⁴ responsible for performing a diagnosis and analysis of productivity in Luxembourg, as well as the related challenges and economic, social and environmental issues in this area. The scope of its work encompasses productivity in the broad sense, including cost and non-cost factors as well as the determining factors of productivity in the long-term. The CNP published its first annual report in April 2020⁵.

The government is pursuing an ambitious pace of public investment. In the draft law on the state revenue and expenditure budget for 2020 as presented in October 2019, direct and indirect public investment increased by 12% over 2019, amounting to 4.4% of GDP. This 2020 budget is an investment budget, one notably including environmental and climate investments. About 20% of all investments made in 2019 were made for environmental and climate protection, and this share is expected to increase further to around 25% by 2022. The measures focus mainly on soft mobility and are laying the foundations for introducing free public transport by the end of February 2020 and are also paving the way for the development of the 5G telecommunications network. With regard to private investment, a recent Eurobarometer survey (2018)⁶ showed that Luxembourg is one of the Member States in which firms perceive that there are generally fewer barriers to investment. Over the years, the government has taken multiple measures and the government programme calls for further ones, notably to encourage digitalization and innovation, to stimulate skills development, to improve sustainable transportation and lastly to increase the supply of housing.

The government has again involved the Parliament and social partners in this year's European semester discussions, with a view to enhancing transparency and fostering national ownership:

- Parliament was involved with the presentation of the NRP & SGP reports in April;
- Social partners have been involved in the national social dialogue under the auspices of the Economic and Social Council (ESC). In autumn 2019, discussions focused on the new country-specific recommendations for Luxembourg, which were adopted in 2019 by the Council. In March 2020, a second meeting was planned, but cancelled due to the spread of the Covid-19 virus.

In conclusion, the coordinated set of measures in the NRP, underpinned by a responsible fiscal policy set out in the framework of the SGP and combined with strengthened governance practices at the national level, should allow Luxembourg to improve the foundations for an economy that features smart, sustainable and inclusive growth and to implement its SDGs to face the challenges the country is facing.

⁴ For more details see: <https://odc.gouvernement.lu/fr/domaines-activite/cnp.html>

⁵ For more details see: <https://odc.gouvernement.lu/dam-assets/domaines/cnp/CNP-rapport-2019.pdf>

⁶ For more details see: EUROPEAN COMMISSION, Flash Eurobarometer 459 - Investment in EU Member States, November 2018

2. Background and macroeconomic aspects

2.1 Developments in the Covid-19 pandemic and main economic policy measures⁷

On 31 December 2019, the WHO offices in China were informed of cases of unknown pneumonia aetiology detected in the city of Wuhan, Hubei Province in China. From 31 December 2019 to 3 January 2020, a total of 44 patients with this type of pneumonia were reported to the WHO by the Chinese national authorities. From that moment, the virus began to spread in an initial phase, especially in neighbouring countries of China, to include Japan and South Korea⁸.

On 24 January, France officially notified the WHO Regional Office for Europe of three confirmed cases. These were the first cases of Covid-19 to have been reported in the European Region⁹. From that point on, the number of confirmed cases continued to increase in Europe. In mid-April, the European Union Member States most affected by Covid-19 were Spain, Italy, Germany and France.

The virus has affected a total of 745,000 people¹⁰ in the EU and caused 73,000 deaths have been linked to Covid-19. This pandemic has resulted in the onset of the third major economic, financial and social crisis of this century with virtually no warning.

The first case of a person infected with the Covid-19 Coronavirus in Luxembourg was confirmed on 1 March 2020¹¹. The virus has spread over the weeks in Luxembourg's neighbour countries, throughout Europe and in most countries of the world. As of April 16, Luxembourg had 3,444 confirmed cases and 68 deaths have been recorded¹². Since the start of the pandemic, Luxembourg has carried out 31,660 tests and released 552 people after hospitalisation.

⁷ The closing date for this chapter is April 17, 2020.

⁸ For more details see: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200121-sitrep-1-2019-ncov.pdf?sfvrsn=20a99c10_4

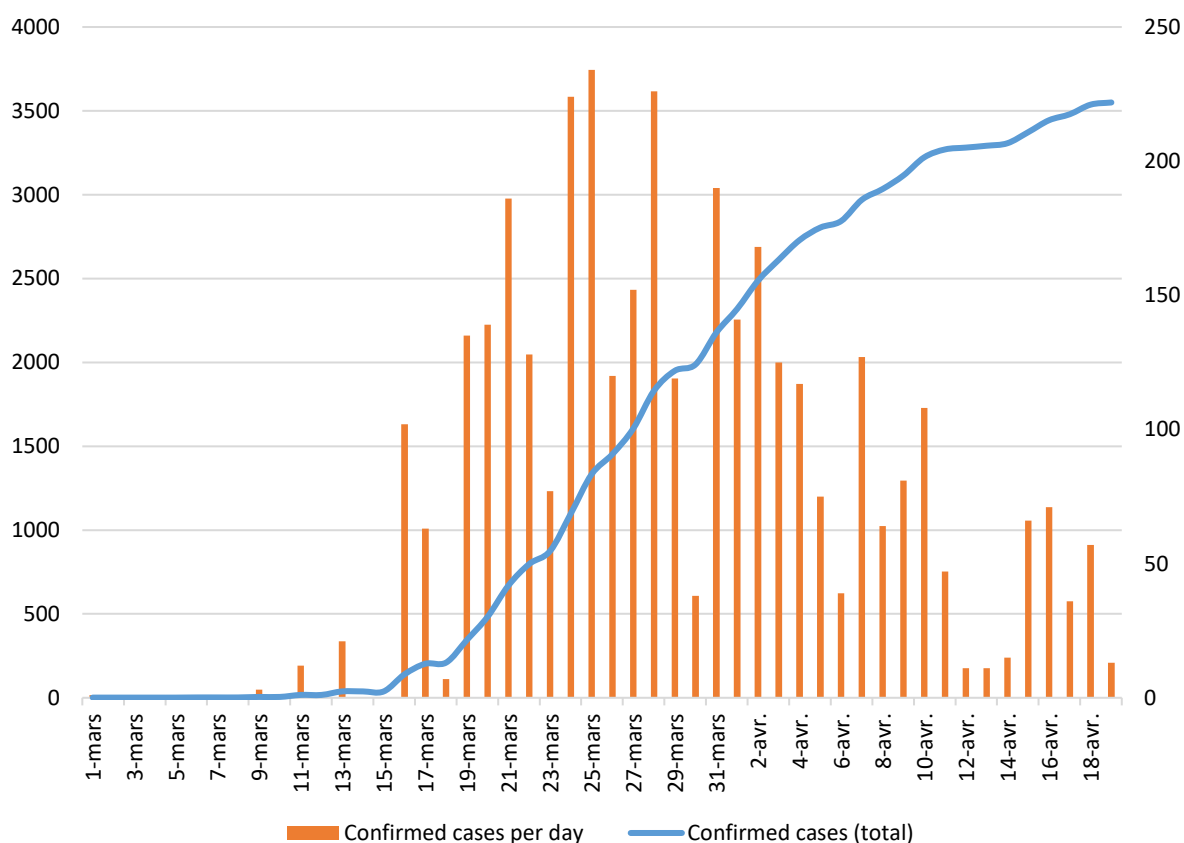
⁹ For more details see: <http://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-Covid-19/news/news/2020/01/2019-ncov-outbreak-first-cases-confirmed-in-europe>

¹⁰ For more details see: <https://www.ecdc.europa.eu/en/cases-2019-ncov-eueea>

¹¹ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2020/03-mars/01-premier-cas-corona.html

¹² For more details on the current situation see: <https://coronavirus.gouvernement.lu/fr.html>

Coronavirus spread status dashboard (Covid-19)



Source: Ministry of Health

The Luxembourg government has taken a series of decisions and measures to protect and provide the best possible treatment of the population. At the same time, it supports, as far as possible, both employers and employees in order to minimize negative economic and social impacts.

On 29 February 2020, the government issued the first protection instructions as well as information on the Covid-19 virus, the symptoms and its transmission¹³.

On 9 March 2020, taking into account the development of the spread of the Covid-19 virus in the regions bordering Luxembourg, as well as those measures implemented in other European countries in general and in neighbouring countries in particular, and given the soaring number of diagnosed infections in Luxembourg, the government deemed it necessary to take additional measures to further limit the spread of the virus in Luxembourg. Thus, the government issued a recommendation to call off or postpone all events of more than 1,000 people in a confined space¹⁴.

In order to introduce extraordinary family leave entitlement for parents whose children have been subject to medical quarantine by a doctor from the Department of Health, the corresponding regulatory provision was modified¹⁵ on 11 March 2020. The notion of quarantine is to be taken in the broad sense of the term, meaning that schools, nurseries and childcare centres ordered closed by the government to limit the spread of an epidemic forcing children to stay at home, is one justification for

¹³ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2020/02-fevrier/29-coronavirus.html

¹⁴ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2020/03-mars/09-coronavirus-manifestations.html

¹⁵ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2020/03-mars/11-conseil-gouvernement.html

obtaining leave for family reasons. Leave for family reasons is equivalent to a period of incapacity for work due to illness or accident. As a result, during leave for family reasons, employees in the private sector continue to receive pay from their employers¹⁶.

Faced with the development of the Covid-19 virus in Luxembourg, which resulted in a significant increase in cases within a short time and the first cases of local transmission, the government met in an extraordinary council on 12 March 2020 to adapt the control strategy. From that point, it began to focus more on the treatment of severe cases and the protection of sensitive population groups. Accordingly, Luxembourg adopted the measures taken by many other countries, in particular Switzerland and Belgium. On this date, it was decided to suspend all primary, secondary and higher education activities as well as all childcare and early education activities¹⁷, for a period of two weeks starting Monday, 16 March 2020. In addition, from March 13, events in confined spaces of more than 100 people were prohibited. On 1 April, it was announced that the suspension of activities in the school and education sector would be extended up until 3 May 2020¹⁸.

On 15 March 2020, the government took additional steps to limit the spread of the virus among the population and to protect those at risk¹⁹. These measures included:

- Restrictions on travel for the general public: traffic on the public roads was limited to essential travel.
- Essential activities remained in place: activities essential to addressing the vital requirements of the population and of the country remained operational.
- Recommendations for businesses: Businesses were asked to use remote working methods insofar as possible and to reduce their activities to tasks essential for the operation of the business.
- Limitation of trade: all retail and trade activities open to the public were closed. This closure does not concern commercial premises that mainly sell essential products (such as pharmacies, opticians, the sale of fuels, etc.). The exceptions had to be justified by public health requirements and in particular entail creating physical separation between customers and the professional providing the service.
- Cancellation of all non-essential activities: cultural, social, festive, sporting and recreational activities were suspended. Establishments in the cultural, recreational, sports and hospitality sectors were closed (museums, bars, restaurants, cinemas, cafés, nightclubs, libraries, swimming pools, gyms, etc.). The ban does not apply to take-out, drive-in and home delivery services. Hotels remained open. Restaurants and hotel bars, with the exception of room service, were closed.

On 16 March, Germany began to control its border with Luxembourg²⁰. On the Luxembourg side, the option of closing the borders was not considered because Luxembourg is highly dependent on daily commuters and the majority of the medical staff is not resident. In order to facilitate the entry of German and French cross-border workers into Luxembourg during border checks, the Luxembourg government issued certificates attesting to the employment of certain persons²¹. This certificate attested to the need to cross the border despite the Covid-19 situation.

¹⁶ For more details see: <https://guichet.public.lu/fr/citoyens/travail-emploi/conges-jours-feries/situation-personnelle/conge-maladie-enfant.html>

¹⁷ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2020/03-mars/12-cdg-extraordinaire-coronavirus.html

¹⁸ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/articles/2020/04-avril/02-suspension-cours.html

¹⁹ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2020/03-mars/15-nouvelles-mesures-coronavirus.html

²⁰ For more details see: <https://www.bmi.bund.de/SharedDocs/pressemitteilungen/DE/2020/03/grenzschliessung-corona.html>

²¹ For more details see: https://gouvernement.lu/de/actualites/toutes_actualites/communiqués/2020/03-mars/16-bescheinigung-berufspendler.html, https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2020/03-mars/16-certificat-frontalier-france.html

As a result of the various measures taken in the fight against the spread of the virus, many cross-border workers have had to work from home during the crisis. To this end, the Luxembourg authorities agreed with the Belgian²², French²³ and German²⁴ authorities that the presence of a worker at his home to exercise his activity there may not be taken into account in the calculation of the period of days worked for the benefit of their Luxembourg employer without the related remuneration being imposed. This measure would be applicable until further notice.

The government declared the state of crisis on 18 March 2020. The purpose of this extraordinary decision is to give the government the opportunity to put in place urgent measures to deal with Covid-19²⁵. On 21 March 2020, Parliament voted to extend the state of crisis, extending in turn this decision for a maximum period of three months²⁶.

In addition to the existing economic support measures put in place, the government requested municipal authorities to pay invoices for works, supplies and services in a timely manner in order to mitigate the risk of cash flow problems in companies²⁷.

On 25 March 2020, the government presented a coherent and substantial economic stabilisation programme²⁸ designed to underpin the national economy to the best degree possible in these times of crisis. This programme integrates existing measures as well as new measures and is based on an analysis of the requirements of economic entities. In addition, it involves the banking sector and the National Credit and Investment Institution (SNCI) alongside a multitude of ministerial departments and public administrations.

The plan consists of a series of measures that address several areas:

²² For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiques/2020/03-mars/16-lux-be-teletravail.html

²³ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiques/2020/03-mars/19-travailleurs-transfrontaliers.html

²⁴ For more details see: https://gouvernement.lu/de/actualites/toutes_actualites/communiques/2020/04-avril/02-grenzpendler-heimarbeit.html

²⁵ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiques/2020/03-mars/19-reglement-mesures.html








²⁶ For more details see: <https://chd.lu/wps/portal/public/Accueil/TravailALaChambre/Recherche/RoleDesAffaires?action=doDocpaDetails&id=7534>

²⁷ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiques/2020/03-mars/23-appel-communes.html

²⁸ For more details see: <https://gouvernement.lu/dam-assets/documents/actualites/2020/03-mars/25-programme-de-stabilisation/Programme-stabilisation-economie.pdf>








CORONAVIRUS COVID-19 // ECONOMIC STABILISATION PROGRAMME

UPDATED VERSION OF 20 APRIL 2020

	MEASURE	OBJECTIVE	INSTITUTION(S)	BENEFICIARY(IES)	FURTHER INFORMATION
Meeting liquidity needs					
	Emergency allowance for the self-employed	Grant self-employed people with less than 10 employees a non-refundable and non-taxable support of €2,500	General Directorate for Small and Medium-Sized Enterprises	Traders, artisans and intellectual workers who work as self-employed	Guichet.lu
	Non-repayable, tax free grants	Grant direct aid in the amount of €5,000 to companies with ≤ 9 employees, forced to cease their operations as a result of the amended regulation of 18 March 2020 ¹	General Directorate for Small and Medium-Sized Enterprises	Micro enterprises	Guichet.lu
	Capital grant advances	Grant financial aid of up to €500,000 in the form of a repayable advance to cover operating costs	Ministry of the Economy General Directorate for Small and Medium-Sized Enterprises	Self-employed SMEs Large enterprises	Guichet.lu
	Full coverage by National Health Fund (CNS) of the remuneration only in case of sickness	The normal mechanism for continuation of remuneration in case of sickness leave is waived and CNS takes over remuneration of sick employees as from the first day of sickness	National Health Fund (CNS)	Self-employed SMEs Large enterprises	
	Moratorium on loan repayments offered by certain banks	Postpone the repayment of loans to better cope with cash-flow difficulties	Ministry of Finance Several banks	Self-employed SMEs Large enterprises	ABBL.lu
	Relaxation of repayment conditions for SNCI loans and credit	Suspend principal repayment at 31 March and 30 June maturities for direct and indirect loans	Société Nationale de Crédit et d'Investissement (SNCI)	SMEs Large enterprises	SNCI.lu
	Advance refund of VAT	Meet liquidity needs through an early repayment of VAT credit balances below €10,000	Registration Duties, Estates and VAT Authority (AED)	Self-employed SMEs	Ministry of Finance








CORONAVIRUS COVID-19 // ECONOMIC STABILISATION PROGRAMME

UPDATED VERSION OF 20 APRIL 2020

	MEASURE	OBJECTIVE	INSTITUTION(S)	BENEFICIARY(IES)	FURTHER INFORMATION
(following)					
	Payment of an advance on extraordinary family leave	Advance partial reimbursement of salaries that employers must continue to pay to the parents concerned	Joint Social Security Centre (CCSS), Employers' Mutual Insurance Scheme, National Health Fund (CNS)	Very small enterprises	Guichet.lu
				SMEs	CCSS.lu
				Large enterprises	
Encouraging research and investment aimed at fighting COVID-19					
	Financial support for companies carrying out investments or R&D projects for products helping to combat the health crisis	Co fund up to 80% of costs for industrial research and experimental development projects as well as investment projects to produce / develop medical devices or hospital and medical equipment	Ministry of the Economy	SMEs	Guichet.lu (R&D)
				Large enterprises	Guichet.lu (Investment)
	Investment aid for the production of articles relevant to the fight against COVID-19	Support companies that reorient their production chain to manufacture e.g. protective masks or produce hydroalcoholic gel	General Directorate for Small and Medium-Sized Enterprises	Very small enterprises	Guichet.lu
				SMEs	
Facilitating bank financing					
	State-backed guarantee facility for new bank loans for up to a maximum of 6 years	Guarantee new bank credit lines, for which the State guarantees up to 85% for a total amount of €2.5 billion	Ministry of Finance Ministry of the Economy	Self-employed	Guichet.lu
				SMEs	
				Large enterprises	
	"Special Anti-Crisis Financing" via companies' banks and SNCI	Cover financing needs in the context of the current crisis through indirect loans ranging between €12,500 and €16.6 million	Clients' banks together with the Société Nationale de Crédit et d'Investissement (SNCI)	SMEs	SNCI.lu
				Large enterprises	
	Financing over a 5 year period to the "Mutualité des PME" and the "Mutualité de cautionnement"	Enable the mutual societies of the professional chambers to extend guarantees provided to SMEs	Société Nationale de Crédit et d'Investissement (SNCI)	SMEs	
	"SME Guarantee" in cooperation with banks active in corporate financing	Provide guarantees for obtaining new working capital lines from banks	Société Nationale de Crédit et d'Investissement (SNCI)	SMEs	








CORONAVIRUS COVID-19 // ECONOMIC STABILISATION PROGRAMME

UPDATED VERSION OF 20 APRIL 2020

	MEASURE	OBJECTIVE	INSTITUTION(S)	BENEFICIARY(IES)	FURTHER INFORMATION
Helping start-ups					
	Reinforced coverage of the financing need of young innovative enterprises	In order to support start-ups, the maximum co-funding rate of 50% has been raised to at least 70% for new young innovative enterprise aids granted	Ministry of the Economy	Start-ups less than 5 years old	Guichet.lu
	Call for projects open until 30 April for innovative solutions to fight COVID-19	Provide support of up to €150,000 for the development of innovative technological products or services intended to limit or even overcome the economic, health or societal effects of the COVID-19 crisis	Ministry of the Economy Luxinnovation	Start-ups	StartUpLuxembourg.com
Maintain employment					
	Short-term employment due to force majeure	Avoid redundancies by ensuring that the State takes over the remuneration of employees (permanent contracts, fixed-term contracts, apprenticeships) that are paid 80% of the salary by the employer	Ministry of the Economy National Employment Agency (ADEM)	Startups SMEs Large enterprises not-for-profits	Guichet.lu
	Extension of residence permits for third-country nationals	For the duration of the state of crisis, expired visas and residence permits for third-country nationals remain valid	Ministry of Foreign and European Affairs	Self-employed Very small enterprises SMEs Large enterprises	Ministry of Foreign and European Affairs
	Jobswitch, a contact platform	Connect the unemployed, staff in short-term employment and self-employed people with companies in need of labour	House of Entrepreneurship	Self-employed SMEs Large enterprises	Jobswitch.lu
	Modification of the standard abatement for domestic costs, aid and care costs due to dependency as well as child care costs	Increase, for the tax year 2020, the standard abatement from €5,400 to €6,750 for taxpayers who, for the period from April to December 2020, used a housekeeper carrying out domestic work in their home	Inland Revenue (ACD)	Private households that have employed staff	Impotsdirects.public.lu
Maintain activity in essential sectors of activity					
	Increase in the maximum working time in essential sectors of activity	Extend, with the agreement of the staff delegation, the maximum working time up to 12 hours a day and 60 hours a week	Ministry of Labour, Employment and the Social and Solidarity Economy	Companies active in one or more essential sectors of activity as defined in art. 3 and 5 in the amended regulation ² of 18 March 2020	Guichet.lu








CORONAVIRUS COVID-19 // ECONOMIC STABILISATION PROGRAMME

UPDATED VERSION OF 20 APRIL 2020

	MEASURE	OBJECTIVE	INSTITUTION(S)	BENEFICIARY(IES)	FURTHER INFORMATION
(following)					
	Refusal or cancellation of annual leave in essential sectors of activity	Allow employers to refuse, during state of crisis, annual leave requests and cancel already granted leave	Ministry of Labour, Employment and the Social and Solidarity Economy	Companies active in one or more essential sectors of activity as defined in art. 3 and 5 in the amended regulation ³ of 18 March 2020	Guichet.lu
	Increase in working hours for certain student contracts in essential sectors of activity	Extend the weekly duration of fixed-term contracts with a student to 40 hours over a period of 4 weeks or a month	Ministry of Labour, Employment and the Social and Solidarity Economy	Companies active in one or more essential sectors of activity as defined in art. 3 and 5 in the amended regulation ⁴ of 18 March 2020	Guichet.lu
	State employee contract for self-employed health professionals	Offer self-employed medical doctors or persons exercising a health profession the opportunity of having a fixed-term contract as a State employee	Ministry of Health	Some health professionals	Guichet.lu
Promoting telework					
	Amended taxation of telework for Belgian, French and German cross-border commuters	Allow cross-border commuters to work from home during the crisis without being taxed in their country of origin	Inland Revenue (ACD)	Self-employed SMEs Large enterprises	Guichet.lu
	Aid to invest in infrastructure intended to set up a teleworking system	Support companies that invest in tools aimed at allowing their employees to telework	General Directorate for Small and Medium-Sized Enterprises	Very small enterprises SMEs	Guichet.lu
Defer payments linked to tax deadlines					
	Cancellation of tax advances for the first two quarters of 2020	Automatically grant a cancellation of tax advances for the first 2 quarters of 2020. This concerns income tax (of firms) and municipal business tax	Inland Revenue (ACD)	Self-employed SMEs Large enterprises	Impotsdirects.public.lu
	4 month deferral for the payment of tax instalments	Request a deferral of payment (without interest) of income tax, municipal business tax and wealth tax	Inland Revenue (ACD)	Self-employed SMEs Large enterprises	Impotsdirects.public.lu


CORONAVIRUS COVID-19 // ECONOMIC STABILISATION PROGRAMME

UPDATED VERSION OF 20 APRIL 2020

	MEASURE	OBJECTIVE	INSTITUTION(S)	BENEFICIARY(IES)	FURTHER INFORMATION
(following)					
	Deferral of tax return filings	Set the deadline for the submission of tax returns for legal and natural persons at 30 June 2020	Inland Revenue (ACD)	Self-employed SMEs Large enterprises Private persons	Impotsdirects.public.lu
	Extension of the filing deadline for VAT returns	Waive administrative penalties if the deadline for filing VAT returns, subscription tax, inheritance declarations and notarial and bailiff's deeds is exceeded	Registration Duties, Estates and VAT Authority (AED)	Self-employed SMEs Large enterprises	Aed.public.lu
Benefit of administrative tolerance for social security contributions					
	Increased flexibility in the payment of social security contributions	Provide flexibility to companies in cash management and payment of social security contributions, e.g. by temporarily suspending the calculation of default interest for late payments	Joint Social Security Centre (CCSS)	Very small enterprises SMEs Large enterprises	CCSS.public.lu
	Measures for the self-employed in terms of social security contributions	Take advantage, as a self-employed person, of measures to better manage the payment of social security contributions	Joint Social Security Centre (CCSS)	Self-employed	CCSS.public.lu
Benefit from measures to support exporting companies					
	Strengthening of export and international development assistance measures	Increase support for companies that export, and reach clients internationally, including to markets affected by the coronavirus	Office du Ducroire (ODL)	Certain liberal professions Micro enterprises SMEs Large enterprises	ODL.lu
Provide legal protection for companies in difficulty					
	Suspension of the obligation to make an admission of cessation of payments leading to bankruptcy	Exempt firms from the obligation to make an admission of bankruptcy in case they do not have sufficient liquidity	Ministry of Justice	All companies	Ministry of Justice
	Suspension of the forced execution of evictions ordered for residential leases as well as those ordered for commercial leases	Protect tenants during the crisis from immediate forced eviction execution	Ministry of Justice	All tenants with a commercial lease	Ministry of Justice

CORONAVIRUS COVID-19 // ECONOMIC STABILISATION PROGRAMME

UPDATED VERSION OF 20 APRIL 2020

	MEASURE	OBJECTIVE	INSTITUTION(S)	BENEFICIARY(IES)	FURTHER INFORMATION
Support the cultural sector					
	Support measures for independent professional artists and intermittent workers in the entertainment and cultural sector	Grant additional social aid, guarantee subsidies for cancelled projects and grant short-time work benefits to employees in the sector	Ministry of Culture	Self-employed professional artists, intermittent performers	<u>Ministry of Culture</u>

¹ Subject to the agreement of the regulator

² See <http://legilux.public.lu/eli/etat/leg/rgd/2020/03/18/a165/jo>

³ See <http://legilux.public.lu/eli/etat/leg/rgd/2020/03/18/a165/jo>

⁴ See <http://legilux.public.lu/eli/etat/leg/rgd/2020/03/18/a165/jo>

It should be noted that the support measure for businesses linked to partial unemployment provides that if employers use the partial unemployment scheme to mitigate the economic and social consequences of Covid-19, the compensation allowance which in principle corresponds to 80% of normal salary, capped at 250% of the minimum wage for unskilled employees, cannot be less than the amount of the minimum wage for unskilled employees²⁹.

The government has adjusted financial assistance for young innovative companies to support the ecosystem of start-ups. This aid scheme is intended to support the growth of start-ups by providing up to €800,000 to co-finance at least 70% of all the costs borne by a start-up for the duration of a project (before the crisis, it was up to 50%). In addition, on 9 April 2020 the government, in collaboration with Luxinnovation, launched a call for projects under the name "StartupsVsCovid19". Aimed at young innovative companies, the call for projects relates to the development of innovative technological products or services intended to limit or even overcome the economic, health or societal effects of the crisis linked to the Covid-19 Coronavirus pandemic³⁰.

In addition, in order to guarantee that the sectors essential to life do not suffer from a shortage of labour, the government announced at a press conference that specific authorization could be granted to work up to 60 hours per week for people in sectors deemed by the government to be essential to life³¹.

The demand for protective equipment is gradually increasing, spurred by the Covid-19 Coronavirus pandemic. In order to meet the growing need for protective masks and hydro-alcoholic gel, the government decided to support companies that reorient their production chain to produce these essential goods in times of health crisis. Consequently, 100% of the costs linked to adapting to this type of production will be borne by the State through what is known as "de minimis" aid. The granting of this financial aid will be limited to the period of health crisis³².

As part of the economic stabilisation programme, on 8 April the Government Council approved an aid scheme to support both industrial research and experimental development projects as well as investment projects for the production and development of products helping to combat the Covid-19 health crisis³³.

On the same date, in order to financially support the self-employed who play an essential role in the Luxembourg economy, the government approved a draft Grand-Ducal Regulation aimed at establishing certified emergency compensation for them in the amount of €2,500. The granting of this support measure is subject to several conditions. The applicant must be facing temporary financial difficulties due to the consequences of Covid-19, employ less than 10 people and that person's professional income used as a basis for calculating social contributions must not exceed two and a half times the minimum wage³⁴.

Finally, the government has created a website³⁵ for individuals, professionals and businesses that summarizes all the important news related to the Covid-19 virus.

On 15 April 2020, the Council of Government determined the guidelines for a strategy to ease lockdown restrictions that weighs the imperatives of public health and the psychosocial and economic aspects linked to the current confinement³⁶.

²⁹ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2020/03-mars/27-accord-syndicats.html

³⁰ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2020/04-avril/04-appel-startup.html

³¹ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/articles/2020/03-mars/27-kersch-emploi-covid19.html

³² For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2020/04-avril/06-soutien-entreprises.html

³³ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2020/04-avril/08-favot-covid19-aide.html

³⁴ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2020/04-avril/08-aide-independants.html

³⁵ For more details see: <https://coronavirus.gouvernement.lu/fr.html>

³⁶ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2020/04-avril/20-strategie-sortie.html

In mid-April, the rate of new infections showed a downward trend and thus reflected the effect sought by the containment measures implemented on 16 March 2020 in the Grand Duchy. However, the government has decided to act prudently in lifting the containment measures.

Accordingly, the strategy for easing the lockdown restrictions consists of:

- Protecting particularly vulnerable groups;
- Implementing a gradual exit from confinement in sufficiently spaced phases;
- Ensuring, at all times, sufficient hospital capacities in normal and intensive care to accommodate serious cases in health establishments;
- Making the population aware of its responsibilities and limit as much as possible the risk of uncontrolled propagation by maintaining, or even reinforcing the barrier gestures to be observed in any place where people gather;
- Putting in place preventive measures at work;
- Ensuring isolation and close monitoring of new cases of infection;
- Developing testing capacities and support research, in particular with regard to serological tests intended to measure the acquired immunity of the population.

The resumption of activities can therefore only occur in successive phases that are well considered in terms of impact. The Prime Minister and the Minister of Health make a proposal to start a phase, while the decision is taken by the government on the basis of monitoring the general situation, an assessment of the number of newly infected in the population and an estimate of available hospital capacity in the short and medium term.

At its meeting of 15 April, the government in council set up an ad hoc group to support the measures decided upon in the fight against the virus and to regularly assess the effects of these measures and of containment.

It is important to note that any resumption of activities will be accompanied by very strict barrier gestures and obligatory wearing of a mask or any other device allowing the nose and mouth to be covered for situations of interpersonal contact if the sanitary security distance of two meters cannot be guaranteed.

On 22 April 2020, the Government Council approved two draft Grand-Ducal Regulations aimed at implementing new financial support measures for micro- and small commercial and craft businesses. Companies employing between 10 and 20 people will be eligible for a one-time, lump sum payment of €12,500. To this is added an extension of the flat-rate compensation of €5,000, created by Grand-Ducal Regulation dated 25 March 2020, for companies with fewer than 10 people forced to close or stop their activities at companies who, without having been the subject of such a measure, lost at least 50% of their turnover during the period between 15 April 2020 and 15 May 2020. An additional indemnity of €5,000 is also granted to companies of less than 10 people who have not been authorized to resume their activities or who, despite being authorized to resume them, lost at least 50% of their turnover during the period between 15 April 2020 and 15 May 2020³⁷.

All the aforementioned measures adopted to date will be adapted to changes occurring in the pandemic with the aim of ensuring that citizens, employees and employers return to a normal lifestyle as soon as circumstances allow.

³⁷ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2020/04-avril/22-indemnités-entreprises.html

2.2 Macroeconomic perspectives for the period covered by the programme

It should be noted that the NRP measures take into account the constraints of the macro-economic environment dating from February 2020. The recent crisis linked to the spread of Covid-19 has had a profound impact on this environment. Certain measures could thus be modified following the actions carried out to deal with the spread of this pandemic and according to the medium-term budgetary strategy. However, it is likely that the existing structural challenges will remain relevant.

STATEC's macroeconomic forecast holds to a baseline scenario that assumes that the containment phase covers the period from 23 March to 17 April 2020, followed by a gradual lifting of restrictions by July 2020. In addition, the forecast incorporates the government's economic stabilisation measures. Real GDP growth is expected to contract by 6% in 2020. It will likely be accompanied by a virtual stagnation in total domestic employment. In 2021, a 'mechanical' rebound would lead to growth of 7% of GDP while growth in total domestic employment would improve only slightly.

Table 1: Change in economic growth and job creation – baseline scenario (2019-2021)

	Obs.	Baseline scenario	
	2019	2020*	2021*
Growth in GDP (as a %)	+2.3	-6.0	+7.0
Total domestic employment (as a %)	+3.6	+0.7	+1.0

Source: SGP (2020)

Due to the uncertainties in the forecast, STATEC has developed a downside scenario. One feature of this scenario is a much longer period of confinement, as well as a serious unprecedented synchronized world depression. In this scenario, real GDP would fall by 12.4% in 2020. Domestic employment would decrease by 1.3% in 2020 and 2.1% in 2021.

Table 2: Change in economic growth and job creation – downside scenario (2019-2021)

	Obs.	Downside scenario	
	2019	2020*	2021*
Growth in GDP (as a %)	+2.3	-12.4	+1.8
Total domestic employment (as a %)	+3.6	-1.3	-2.1

Source: SGP (2020)

It should be noted that the development of macroeconomic forecasts presents a considerable challenge in the current circumstances, which are characterized by significant uncertainties.

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 ageing³⁸.

³⁸ For more details see: https://europa.eu/epc/working-group-ageing-populations-and-sustainability_en

Box 1: Volatility and reliability of Luxembourg macroeconomic data

In June 2019, the Economic and Social Council (ESC) in Luxembourg published its annual opinion, including a specific section dedicated to the volatility and reliability of Luxembourg macroeconomic data³⁹. As part of the normal national accounts review process, revisions to GDP can sometimes be substantial, which has led the ESC to devote part of its annual opinion to a more in-depth analysis of this flagship and emblematic indicator. The opinion addresses the imperfections of GDP as an indicator and tries to highlight the elements that are at the origin of the numerous revisions of this indicator as updates of the data flow in from the national accounts. Finally, the ESC notes that even if GDP is questionable and often contested, replacing it with another indicator does not seem relevant. Accordingly, the ESC does not recommend abandoning GDP in favour of some adjusted GNI or other indicator. The ESC believes, on the other hand, that it could be advantageous to provide more detail to certain aggregates in order to be able to distinguish the part of the GDP based on more traditional economic activities from the part from the international value chain of companies.

Box 2: Round out the analysis of the macroeconomic situation through a “Well-Being” indicator

In addition to the indicators generally used to analyse the macroeconomic situation in Luxembourg in the context of the European semester, such as the growth of gross domestic product (GDP) or trends in employment and unemployment, it turns out that it is also important to take a closer look at the living conditions of citizens. It is in this context that the government has implemented a well-being indicator over the past few years in order to better monitor how the economy is developing in the service of citizens.

In April 2010, the government decided to refer the issue to the Economic and Social Council (ESC) and the Superior Council for Sustainable Development (CSDD) in order to develop and recommend a system of well-being indicators measuring the progress of society over the long term, one that goes beyond traditional indicators⁴⁰. In their joint opinion “*PIBien-être*” (2013), or GDP well-being, the Councils built a dashboard covering the important aspects of the lives of citizens and influencing their current and future well-being.

In 2018, STATEC published the well-being report in which it analyses individual indicators, groups and a composite indicator integrating the numerous GDP well-being indicators⁴¹. This suggests that the quality of life in Luxembourg has remained substantially constant. Over time, after an initial drop likely due to the effects of the crisis, the quality of life almost returned to its 2009 level. On the other hand, the trajectory of “GDP well-being” contradicts the information provided by measures of well-being based on income, which essentially follows a positive trend. The GDP well-being indicator currently includes 63 indicators, covering 11 areas of life, 18 of which are also used in the context of the Sustainable Development Goals (SDGs) set out in the 2020 country report for Luxembourg of the European Commission.

The census of the quality of life of Luxembourg residents is done through a wide range of indicators and fields covering the dimensions of income and wealth, work, housing, health, education and skills, governance and environment.

According to the STATEC report, the benefit of the GDP well-being indicator is that it enables to statistically follow a complex and multifaceted concept such as quality of life, and to identify policy areas that require investigation and action. Well-being is a tool for browsing this vast pool of information, and it can be directly compared to important well-being indicators such as GDP.

³⁹ For more details see: <https://ces.public.lu/dam-assets/fr/avis/avis-annuels/2019-avis-annuel-partie-1.pdf>

⁴⁰ For more details see: <https://ces.public.lu/fr/actualites/2013/11/pibienetre.html>

⁴¹ For more details see: <https://statistiques.public.lu/fr/publications/thematique/conditions-sociales/pibien-etre/index.html>

Recently, the GDP well-being indicator has gained further importance following public debates surrounding economic growth, inequality, the environment and mobility, to name a few. The GDP well-being indicator should indeed make it possible to better understand the living conditions of citizens and be useful in monitoring a sustainable policy serving citizens. In this sense, it should also contribute to national social dialogue⁴².

2.3 Macroeconomic impact of structural reforms

Over recent years, major efforts have been made in Luxembourg in the area of evaluating reforms. An econometric DSGE (Dynamic Stochastic General Equilibrium) model, called the Luxembourg structural model (LSM), has been developed in order to better simulate macro and microeconomic impacts of structural reforms. Some characteristics of the model make it particularly well adapted to analyse economic policies implemented by Luxembourg. It integrates the economic specificities of Luxembourg, especially the particular functioning of the labour market that takes into account residents and cross-border workers, the importance of negotiations between unions and companies, and the fact that Luxembourg is a small, very open economy. An initial version of the LSM was widely used in reviewing the consequences of structural policies. However, this initial version was not appropriate for studying the consequences of the high level of Luxembourg's specialization in financial services. The development of a new version, known as LSM2, addresses this concern. The LSM2 model including the financial sector for Luxembourg was introduced in June 2012. Still, one must not lose sight of the fact that there is no ideal structure for an institutional macroeconomic model⁴³.

Box 3: Third National Plan for Sustainable Development (PNDD3)

The third National Plan for Sustainable Development constitutes the main instrument for implementing the development framework for the period 2015-2030 entitled "Transforming our World: The 2030 Agenda for Sustainable Development" adopted by the United Nations, as well as Agenda 2030 and its 17 Sustainable Development Goals⁴⁴.

Chapter II of the National Plan for Sustainable Development, "A strategy that embodies change" recommends ten priority fields of action:

1. Ensure social inclusion and education for all;
2. Ensure the conditions for a healthy population;
3. Promote sustainable consumption and production;
4. Diversify and ensure an inclusive and future-oriented economy;
5. Plan and coordinate the use of the territory;
6. Ensure sustainable mobility;
7. Stop the degradation of our environment and respect the limits of natural resources;
8. Protect the climate, adapt to climate change and ensure sustainable energy;
9. Contribute to the eradication of poverty and to the coherence of policies for sustainable development on a global level;
10. Guarantee sustainable finances.

These fields of action are the result of a process of discussion and work, both at political and societal level and are recommended as priorities to render the development of the country more sustainable in relation to the objectives of the 2030 Agenda. They are presented along the same common pattern: the long-term ambition for Luxembourg in this field of action, the challenges to be met by 2030 and the measures and initiatives as cornerstones of the government action implemented or envisaged by the various ministries to achieve the objectives sought.

⁴² Questions on the subject of GDP well-being – Speaker: Franz Fayot, Minister of the Economy, 6 February 2020.

⁴³ For more details see: http://odc.gouvernement.lu/fr/domaines-activite/Outils-evaluation_competitivite/modele-structurel-luxembourgeois-lsm.html

⁴⁴ For more details see: <https://environnement.public.lu/fr/developpement-durable.html>

In the "Country Report 2020 - Luxembourg", the Commission's assessment - carried out based on the EUROSTAT indicators - is consistent with the priorities selected by the government in the National Plan for Sustainable Development, although it is incomplete.

The European Semester with the Europe 2020 strategy and the National Reform Programme already integrate policies addressed by the Sustainable Development Goals, such as education, social inclusion, renewable energy production and climate change.

Aside from climate change and efforts to mitigate greenhouse gas emissions, environmental challenges for sustainable development are currently not part of the NRP. However, Luxembourg faces challenges in terms of natural resources and biodiversity.

According to the report of the European Environment Agency, Luxembourg is the country where the index of territorial fragmentation is the highest among 29 European countries, on a level similar to that of the peripheral regions in certain European capitals. Population growth and housing needs - a problem highlighted in the "Country Report 2020 - Luxembourg" - are partly responsible for the loss of 174 hectares of land per year, or 0.5 hectares per day; the other cause is from the construction of transport infrastructure - another problem highlighted by the Commission - a response to the growing mobility needs of active residents in rural communities (affordable land for housing), but also of cross-border workers who live far from the employment hubs.

This fragmentation of the national territory, resulting from urban and suburban development and from an increased density of transport infrastructure, has harmful effects on biodiversity and ecosystems, resulting in an alarming reduction in certain biotopes and ecosystems (SDG 11, 12 and 15). It also hinders the free movement of wild fauna and therefore the genetic exchanges between individuals and populations. We thus see that almost 50% of fauna species are threatened, while of the 1,323 vascular plants inventoried, 345 species (26.7%) are endangered and 101 (7.6%) already extinct (ODD15).

These same pressures affect the hydric regimes of ground and surface water. According to the inventory carried out within the framework of the hydrographic district management plan for 2015-2021, out of the 102 natural surface water bodies, 72 have an average status, 19 have a poor status, 7 have a bad status, while two enjoy good status and none have a very good status (see ODD6).

Luxembourg's economic and demographic growth has caused the demand for water for human consumption to continue to grow. Securing the supply of drinking water has become an issue of capital importance in the face of multiple pressures, originating primarily from diffuse pollution from agriculture (nutrients and pesticides) as well as from urban waste water (and to a lesser extent, industrial), but also other factors, such as climate change leading to a seasonal variation in rainfall (SDG6).

Soil is a limited resource in Luxembourg, it is extremely fragile and is being degraded continuously. It is highly unlikely that land set aside for urban development and infrastructure will be returned to its natural state. This situation mainly reduces land for agriculture and increases the fragmentation of natural habitats. The rate of soil artificialization (increase in artificial areas) was 0.32% per year in Luxembourg between 2006 and 2012, and represented 75 hectares per year, almost exclusively attributable to the construction sector.

The forest ecosystem plays a vital role in air quality, a theme also noted by the Commission in the country report. Despite significant reductions, emissions of nitrogen oxides and volatile organic compounds as well as ammonia emissions remain close to the thresholds set at EU level. In 2014,

EU air quality standards for nitrogen dioxide were exceeded in the territory of the City of Luxembourg. In addition, the target values and long-term goals for ozone concentrations have been exceeded. The external costs, linked to health, resulting from atmospheric pollution in Luxembourg are estimated to be greater than €859 million / year (adjusted income, 2010), including not only the intrinsic value of a healthy life, but also indirect costs to the economy (SDG15, SDG3).

Both the fragmentation of the territory and climate change also have a negative influence on the state of health of all forest species, which for 30 years have been deteriorating steadily. In turn, this fragmentation of the territory has repercussions on human health, since forests constitute the largest carbon reservoir (volume of CO₂ storage representing seven years of CO₂ emissions) and are giant air filters (50 tonnes of dust collected per hectare per year) (ODD15, ODD3).

3. Political responses to the major economic challenges

It is important to note that a large part of this chapter was drafted before the spread of COVID-19 in Europe. Certain measures could be modified following actions taken to deal with the spread of this pandemic.

3.1 Implementation of country specific recommendations for 2019-2020

In July 2019, the Council adopted two recommendations on Luxembourg's SGP and NRP for 2019-2020. This chapter describes the measures implemented in Luxembourg to address these recommendations.

3.1.1 Employment rate of older people and long-term sustainability of the pension system

"Increase the employment rate of older workers by enhancing their employment opportunities and employability. Improve the long-term sustainability of the pension system, including by further limiting early retirement."

3.1.1.1 Employment rate of older people

The new mechanism to combat long-term unemployment, which has been in effect since July 2017, aims to support the creation of new jobs in the municipality, para-public or social services sector that correspond to real needs. These jobs must be new, not targeting replacement of staff and, above all, not creating situations of unfair competition compared to the private sector. Specific measures are aimed at job seekers aged 50 and over. Since the programme was launched, 80% of the beneficiaries of this mechanism are 50 years or older.

The reform of the professional reclassification system, in effect since 1 January 2016, aims at accelerating procedures, achieving a more thorough preservation of individual rights in external reclassification and creating conditions conducive to internal reclassification. The concept was based on supporting companies in their efforts to improve working conditions by making experts available, by emphasizing internal reclassification, i.e. within a worker's same company, in external reclassification efforts, and above all, improving reinsertion of reclassified persons into a job. Based on the initial conclusions related to the implementation of the law, the idea to adjust a certain number of issues in close cooperation with social partners is under review.

The professionalisation placement programme⁴⁵ and the professional reinsertion contract⁴⁶ are two measures that have become applicable since 1 January 2016. They are intended for job seekers at least 45 years old, those in outplacement or those with the status of disabled worker. The first measure is a work placement with a maximum period of six weeks giving job seekers the opportunity to highlight their professional capabilities within a company. The second measure offers job seekers the possibility of improving their knowledge and professional capacities within a company for a maximum period of 12 months. These measures are intended for companies that can provide a real opportunity for hiring people on permanent contracts.

The reform of the early retirement schemes⁴⁷, including the solidarity, progressive and early retirement systems of shift and night workers, excluding adjustments, in effect since December 11th, 2017, aims to target more employees with difficult jobs, consequently placing greater emphasis on the working conditions of employees, while favouring the retention of older workers in companies. More

⁴⁵ For more details see: <https://adem.public.lu/fr/demandeurs-emploi/aides-financieres-mesures/mesures-emploi/stage-professionnalisation.html>

⁴⁶ For more details see: <https://adem.public.lu/fr/demandeurs-emploi/aides-financieres-mesures/mesures-emploi/Contrat-reinsertion-emploi.html>

⁴⁷ Law dated 30 November 2017: <http://legilux.public.lu/eli/etat/leg/loi/2017/11/30/a1032/jo>

precisely, the law abolishes the early retirement-solidarity system and has modified other early retirement systems.

In order to support and improve lifelong learning (LLL), a key factor in maintaining employees on the job, especially older ones, the government will progressively implement the measures of the white paper on the national strategy for lifelong learning⁴⁸. There are eight of these measures, including the adaptation of the LLL mechanism to the life cycle of the learner and diversity in Luxembourg society, and the development of quality in the area of adult training.

3.1.1.2 Long-term sustainability of the pension system

The various foundations of social security are regularly monitored in order to ensure that the services provided are in line with the needs of the insured and that their financial sustainability is assured over a given period, which varies depending on each of the pillars of social security. In recent years, the monitoring mechanisms have been strengthened and broadened by specific legislative provisions introduced when the reforms were carried out. This applies in particular to the pension insurance and long-term care insurance schemes, which require foresight in the medium and long term by the very nature of their services.

The results of the analyses carried out through the mechanisms in place or on an ad hoc basis are discussed with the social partners and other stakeholders to ensure good strategic management and long-term sustainability of each pillar.

Accordingly, with regard to the general pension insurance scheme, whose legislative reform entered into effect on 1 January 2013, the legislation provides that the General Inspectorate of Social Security (IGSS) analyse the financial situation of the scheme every five years at the middle and end of the ten-year coverage period. One of the aims of the reform was to adjust the replacement rate of pensions to life expectancy and to plan for regulating mechanisms if financial resources are inadequate, as well as to reduce the gap between legal and effective retirement ages, by means of an active policy to facilitate the conditions for maintaining older employees in employment.

In its 2013-2018 programme⁴⁹, the government decided to move the first IGSS analysis forward by one year and to set up a dedicated group composed of various stakeholder experts to discuss and present conclusions and to make recommendations where appropriate.

Accordingly, the analysis of the general scheme done in 2016⁵⁰, which was carried out on the basis of the IGSS actuarial balance sheet with regard to the financial situation of the general pension insurance scheme presented on 2 December 2016, concludes⁵¹ that the general pension insurance scheme is in quite a comfortable financial position.

Indeed, consecutive surpluses have resulted in the accumulation of a compensation reserve, which, at 31 December 2018, corresponded to 4.35 times the amount of annual pay-out, well above the minimum required level of 1.5 times the amount of annual pension benefits. The medium-term forecasts and the long-term actuarial projections confirm that the current overall contribution rate of 24% makes it possible to comply with the stipulations of Article 238 of the Social Security Code until the end of the current coverage period extending from 2013 to 2022.

⁴⁸ For more details see: <http://www.men.public.lu/catalogue-publications/adultes/informations-generales-offre-cours/livre-blanc-lifelong-learning/131025-s3l-livreblanc.pdf>

⁴⁹ The Pensions Group consisted of experts from different ministries and professional chambers. Its task was to check the concordance of newly introduced provisions in the middle of the legislative period on the basis of an actuarial opinion drawn up by the IGSS, including the readjustment mechanism.

⁵⁰ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2016/12-decembre/02-bilan-assurance-pension.html

⁵¹ The Pensions Group report is available by going to the following link: <https://gouvernement.lu/fr/publications/rapport-etude-analyse/igss/rapport-du-groupe-de-travail-pensions/2018/rapport-du-groupe-de-travail-pensions.html>

The report also highlights the fact that while the impacts of the 2012 pension insurance reform with effective date of 1 January 2013 on the financial situation of the scheme are still not fully apparent, actuarial projections confirm that the mechanisms introduced by the pension insurance reform will have a positive effect on the financial situation of the general retirement system over the long term.

As provided by law⁵², the next analysis of the financial situation of the general pension scheme must be carried out no later than the beginning of 2023.

With regard to long-term nursing care insurance, which today concerns around 14,500 persons, the government has undertaken a reform to modernize this pillar in order to respond to the challenges of demographic change and to continue to guarantee equitable access to high quality benefits⁵³. The main objectives of the reform⁵⁴, which took effect on 1 January 2018, consist in better individualisation of the offer of quality services that meet the daily needs of each person, an improvement in quality by standards and clear criteria with adequate controls, simplification of procedures and consolidation of the system in the light of societal developments and in compliance with the fundamental principles of the basic 1998 law.

In addition, the law provides for tools to better monitor the entire system of long-term nursing care insurance, thus allowing better anticipation of future changes.

In this context, it should be emphasized that it is one of the government's efforts to involve social partners and more broadly, all stakeholders to the extent possible, in developing and implementing the various reforms through concerted action by all parties. This aims to ensure that the reforms are also carried as far as possible by the stakeholders and to continue to ensure access to quality services in the future while ensuring a financial balance of the various pillars of social security.

Indeed, ensuring the level of benefits of each pillar is essential, both regarding pensions and health care (health insurance) or long-term (nursing care insurance), in addition to the financial balance, which obviously has to be ensured.

This priority is therefore in line with the United Nations Sustainable Development Goals⁵⁵, and more specifically those aimed at ensuring access to high quality, accessible social security benefits for all protected persons. This also applies to pensions, the level of which should allow all beneficiaries to live in dignity, especially retirees who had low income throughout their lives.

The same is true for benefits aimed at maintaining a certain independence of beneficiaries, as far as possible, who depend on the care of a third party.

⁵² For more details see: <http://legilux.public.lu/eli/etat/leg/loi/2012/12/21/n7/jo>

⁵³ To review the key elements of the reform, please go to: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2016/06-juin/21-schneider-copas.html

⁵⁴ Law dated 12 July 2017

⁵⁵ Luxembourg 2030: 3Rd National Plan for Sustainable Development, December 2019: <https://environnement.public.lu/dam-assets/documents/developpement-durable/PNDD.pdf>

3.1.2 Regulated professional business services

“Reduce barriers to competition in regulated professional business services.”

In the Luxembourg SBA Fact Sheet (November 2017)⁵⁶, the European Commission noted that the Luxembourg business services sector has recently experienced exceptional growth, with management & consulting, legal and accounting services acting as the main drivers. Business services in Luxembourg enjoy a favourable business environment for value creation and employment. In Luxembourg, many foreign companies are established and are providing services daily inside the country. In addition, a multitude of business creators rely on the recognition of their professional qualifications based on European rules. Authorizations to set up businesses in Luxembourg reflect an image close to the structure of its population (48% of foreign residents) and its workforce (> 70% of foreigners, either foreign residents or cross-border workers). Luxembourg is therefore clearly among the most open economies in the EU. These factors make it necessary to put into perspective the message that the obstacles to competition are significant in Luxembourg. Furthermore, the Government is of the opinion that regulations, such as those related to vocational training or access to regulated professions, make sense insofar as they aim not only at ensuring quality services, but also seek to guarantee user safety.

The number of applications for establishing and operating businesses by foreign providers of occasional services (EU) increased by + 7.3% between 2018 and 2019, with a relatively constant rate of applications approved (91.2% in 2019 compared to 92.4% in 2018). On the other hand, the growth rate of companies active in the service sector (NACE Rev. 2 HN and S95) shows, on average between 2010 and 2017, growth of + 4.5% per year, well above the EU-28 average of + 3.4%⁵⁷.

With a view to improving the business environment by reducing regulatory obstacles, the government continues to adapt the regulations governing access to the commercial, craft and liberal professions.

The bill transposing Directive 2018/958 of the European Parliament and of the Council dated 28 June 2018 on a proportionality check before the adoption of new professional regulations was tabled in the Chamber of Deputies in early October 2019⁵⁸. Once in force, this new law will impose a proportionality test on any new provision regulating access to and the exercise of regulated professions. The purpose of this examination is to review the proportionality of the desired provision with a view to reducing the regulation of professions in the long term.

A bill reforming the right of establishment is expected to be tabled in the Chamber of Deputies in the summer of 2020. With a view to de-regulating professions, this new text aims to promote and facilitate access to professions by creating a framework adapted to today's business world. This work was designed based on the criteria laid down in the Directive (EU) 2018/958 on a proportionality test. In order to considerably simplify its legal framework, the key element of this reform consists in setting up three new lists of professions drawn up according to the professional qualifications required:

- List A - Professional qualifications earned through a master's qualification.
- List B - Professional qualifications earned through a professional aptitude diploma.
- List C - No diplomas.

⁵⁶ EUROPEAN COMMISSION, 2017 SBA Fact Sheet Luxembourg, November 2017, p.3: “Professional activities is another sector which has experienced outstanding growth recently. In 2012-2016, SME employment in professional activities rose by 19.2% and SME value added increased by 42.9%. The main growth drivers were the sub-sectors management and consulting (for SME value added), and legal and accounting (for SME employment).”

For more details see: <https://ec.europa.eu/docsroom/documents/26562/attachments/19/translations/en/renditions/native>

⁵⁷ For more details see: https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=sbs_na_1a_se_r2&lang=fr

⁵⁸ For more details see: <https://chd.lu/wps/portal/public/Accueil/TravailALAChambre/Recherche/RoleDesAffaires?action=doDocpaDetails&id=7478>

The rules on accountants and auditors will be reviewed as a result of the changes being considered to the right of professional establishment. The regulatory reform concerning architects and engineers will be finalised in 2020.

3.1.3 Economic policy linked to investment

“Focus economic policy related to investment on fostering digitalisation and innovation, stimulating skills development, improving sustainable transport, and increasing housing supply, including by increasing incentives and lifting barriers to build.”

Since the global economic and financial crisis began a decade ago, the EU has suffered from a low level of investment. Collective and coordinated efforts were needed to reverse this downward trend. The Investment Plan for Europe⁵⁹ aims to remove barriers to investment through complementary actions at national and EU levels.

While public investment in Luxembourg exceeds the EU average, private investment as a percentage of GDP is among the lowest in the EU. The government is pursuing an ambitious pace of public investment. In the revenue and expenditure budget for 2020, investments increased by + 12% and direct and indirect investments represent 4.4% of GDP. This 2020 budget is an investment-oriented budget, including expenditures in the areas of the environment and climate. About 20% of all investments made in 2019 were made for environmental and climate protection and this share is expected to increase to almost 25% in 2022. Faced with the observation that transport of all kinds accounts for more than 60% of Luxembourg's CO2 emissions, proposed measures focus mainly on soft mobility and have paved the way to introducing free public transport as from the end of February 2020. Overall, the budget law provides for ambitious investments of up to €500 million in mobility, public transport, transport infrastructure, sustainable energy and the development of sustainable finance. The 2020 budget also opens the way to developing the 5G network in Luxembourg and will position the country among the pioneers in this field. In its analysis of Luxembourg's Draft 2020 Budget Plan, the European Commission mooted this significant increase in public investment: *“Since 2019, several flagship measures have been implemented, notably (...) the significant increase in investments in areas such as housing, education, research, digitization, transport infrastructure, sustainable energy, culture and social structures”*⁶⁰. During a first policy debate on thirty major infrastructure projects on 2 April 2020, Parliament agreed in principle that the government could launch studies to construct a series of new buildings, roads, cycle paths and railway facilities. Obviously, MPs addressed the potential impact of the Covid-19 pandemic on the funding of infrastructure projects and the possible need to prioritize them⁶¹.

With regard to private investment, a recent Eurobarometer survey (2018) showed that Luxembourg is one of the Member States in which firms perceive that there are generally fewer barriers to investment than in most other EU countries. Over the past few years, the government has taken multiple measures and the government programme calls for a whole new series, notably to encourage digitization and innovation, to stimulate skills development, to improve sustainable transportation and ultimately to increase availability of housing.

Within the framework of multilateral surveillance, various obstacles to investment have been identified for Luxembourg from a macroeconomic perspective: digitization and innovation, skills development, sustainable transport and housing supply. By way of illustration, a partial list of measures providing elements of the government's response to the recommendation that was sent to Luxembourg in the area of investment is given below.

⁵⁹ For more details see: https://ec.europa.eu/commission/priorities/jobs-growth-and-investment/investment-plan-europe-juncker-plan_fr

⁶⁰ European Commission, *Analyse of the Draft Budgetary Plan for Luxembourg*, SWD(2019) 922 final, Brussels, 20.11.2019

⁶¹ For more details see: <https://chd.lu/wps/portal/public/Accueil/TravailALAChambre/Recherche/RoleDesAffaires?action=doDocpaDetails&id=7522>

3.1.3.1 Digitalisation and innovation⁶²

Wider digital integration of the Luxembourg economy has been a major priority for the government for years and the government programme repeatedly mentions actions in the field of digitisation. Luxembourg ranks 6th in the EU on the Digital Economy & Society Index (DESI)⁶³, a European Commission report on the digital economy and society whose most recent edition was published in 2019. Luxembourg is one of the leading countries for connectivity, human capital and use of the Internet, yet in terms of integration of digital technologies by businesses and public digital services, the country ranks somewhat lower. Luxembourg therefore has a solid foundation for responding to future challenges as significant efforts have been continuously implemented over the last decade, although further efforts are still to be made in the area of digital integration of businesses and digital public services.

The government, which took office in late 2018, created the Ministry of Digitalisation⁶⁴ which defines digital government and digital inclusion as main strategic pillars. This ministry crystallizes the government's will to place digital transformation at the heart of its policy.

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 of Digitalisation, which supervises the Centre for State Information Technologies, is to strengthen Luxembourg's digital transformation mainly through the digitalisation and simplification of administrative procedures in an agreeable and secure environment⁶⁵. To this end, the ministry wants to consolidate the principle of “digital by default” and “once only”, as well as to create a digital culture within ministries and administrations. Against this backdrop, paramount importance is given to the fact that any new law takes account of electronic implementation from its conceptualization phase. In addition, all interactions and transactions between administrations, as well as between administrations and citizens and businesses, should be able to take place electronically.

One of the other major challenges of the ministry also concerns digital inclusion. This means that everyone must have the opportunity to access to the digital world. In this context, the Ministry of Digitalisation has created an interdepartmental working group to discuss the current state of initiatives under way or planned by the various ministries with the aim of launching a first national action plan for digital inclusion.

On 3 July 2019, the Ministry of Digitalisation requested a consultation debate from the Chamber of Deputies in order to hold discussions on the digital transformation of Luxembourg. To allow a fruitful debate between the ministry and the deputies, a summary document⁶⁶ on the digital transformation of Luxembourg has been prepared to provide lawmakers with an overview of the crosscutting developments and initiatives implemented in recent years in the digital field. The Ministry of Digitalisation in particular takes stock of the evolution of digital transformation in Luxembourg by international comparison, highlighting the guiding principles of current policy in this area and the digital skills necessary for Luxembourg to achieve better digital inclusion.

In May 2019, the government presented its strategic vision for artificial intelligence and a strategy for the data economy. The government's strategic vision for AI is taken from political principles issued by the European Commission. In October 2019, the government set up an inter-ministerial coordination committee for the AI vision. At the same time, in order to promote the use of AI within public

⁶² See chapter 4.2 The R&D objective and the key measures for achieving it

⁶³ For more details see: <https://ec.europa.eu/digital-single-market/en/desi>

⁶⁴ For more details see: <http://legilux.public.lu/eli/etat/adm/agd/2018/12/05/b3633/fo> & <https://digital.gouvernement.lu/fr.html>

⁶⁵ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2019/06-juin/24-hansen-digitale.html

⁶⁶ For more details see: <https://digital.gouvernement.lu/dam-assets/actualites/articles/2019/06-juin/17062019-02-Debat-de-consultation-la-transformation-digitale-du-Luxembourg.pdf>

administration, a call for projects was launched in order to identify and support important projects with ministries or administrations.

Other initiatives launched by the Ministry of Digitalisation in 2019:

- National Interoperability Framework (NIF) approval

The NIF aims to provide a general framework enabling public actors falling under its scope to attain a higher level of interoperability.

A high level of interoperability is a central and essential element that enables the country to efficiently, sustainably and reliably advance on the path of digital transformation and to set up a modern, efficient and effective administration, which defines the user, his needs, his expectations and requirements as a fundamental priority.

- Launch of a public sector blockchain technology

While DLT technologies are now mainly used in the financial sector, this powerful technology can also be used for non-monetary matters. 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. It is in this spirit that, during the Infrachain Summit 2019, the Minister responsible for Digitalisation announced the creation of a public sector blockchain. This project allows the government to develop a series of new blockchain applications reserved for the public sector as well as applications involving interactions between the public and private sectors.

The Media and Communications Service / Digital Luxembourg, together with the National Institute in charge of continuing education for the public service (INAP), is endeavouring to set up custom training courses for public actors to support them in their AI projects⁶⁷.

The government launched in 2019 the data-based innovation strategy that supports the digital transformation of economic sectors considered as a priority: manufacturing industry 4.0, logistics, environmental technologies, health technologies, space industry and financial services. The field of information and communication technologies (ICT) is the transversal engine of the digital transformation for these sectors, which have been actively developed for over 10 years in order to further diversify the national economy. This innovation strategy proposes specific actions for each of the selected economic sectors to be implemented to increase productivity and ensure their sustainable development in a data economy. The proposed measures are based on three tenets: strengthening the digital infrastructure, supporting businesses to integrate innovative digital technologies and creating a legal and financial environment favourable to the data economy.

In order to be able to support Luxembourg craft businesses in the challenges resulting from digitalisation, the Federation of Craftsmen, the Crafts Skills Centres and the IFSB have created the DigiHw Skills Centre (Digi-HW). The latter is positioned in the fourth section of the PRO Craftsmanship Pact launched by the Ministry of the Economy, which concerns digitalisation in craft businesses as part of the “Crafts 4.0” programme as well as within the framework of the Digital Skills Bridge project, launched by the Ministry of Labour. It is a benchmark partner for craft businesses for the development and implementation of strategic processes in the field of digital transformation. The Skills Centre and Luxinnovation have signed an agreement confirming the cooperation between the two players. The Digi-HW Skills Centre serves as a contact point for craft businesses within the

⁶⁷ For example <https://training.devoteam.lu/catalog/artificialintelligence> of which a number of training courses are specially adapted to the Civil Service

framework of the "Fit4Digital" programme, with the strategic, organizational and administrative support of the Skills Centre.

As part of the EuroHPC joint venture and in line with the data-driven innovation strategy, which aims to develop a sustainable and reliable digital economy, Luxembourg plans to acquire a supercomputer (called "Meluxina") which will support the digital transition of the economy and will offer businesses new opportunities to innovate and remain competitive in an increasingly digital world⁶⁸. The establishment of a supercomputer in Luxembourg is also one of the priority measures of the Rifkin strategy of the third industrial revolution, which places digitalisation and the use of data at the core of economic and social development. This supercomputer will be focused on the needs of the users. It will be dedicated to applications in research, personalised medicine and eHealth projects, but also to the needs of companies, in particular SMEs and start-ups. In order to facilitate access to the use of Meluxina's capacities, a specific skills centre will guide and support companies with limited skills in this area.

In addition to these numerous efforts in the field of digitalisation, there is the 5G strategy, presented for the first time in September 2018⁶⁹. This Luxembourg national strategy is part of the European Commission's 5G action plan and the European roadmap for the introduction of 5G, which aims to make its first inroads in 2020. It was developed after consultation with a broad spectrum of interested stakeholders, following a meeting of the Digital Luxembourg infrastructure group on this subject in July 2017.

In recent years, the government has taken multiple measures to increase private investment in the areas of Research, Development and Innovation (RDI), economic diversification and investment support:

The coming into force of the new RDI Promotion Act⁷⁰ in June 2017 gives the government access to a series of tools to effectively support businesses in their RDI approach. This law allows action on companies of all sizes as well as at different levels of the innovation chain. It also makes it possible to reinforce SME innovation via a specific regime. In addition, it offers a strong incentive for the establishment of collaborative research between companies and with public players⁷¹.

The implementation of the space policy reflects the government's desire to diversify the economy by actively supporting the development of a "new space" industry. This relies on the experience gained in Luxembourg by one of the world leaders in the satellite communications sector. Through the spaceresources.lu initiative⁷², Luxembourg is projecting itself into the future space economy, the development of which will be facilitated thanks to the use of available resources in space. By adopting a law in July 2017 whose purpose is to clarify the question of appropriating the resources that can be collected in space and to set up a system of authorization and supervision of these activities⁷³, Luxembourg has positioned itself as a European hub for the exploration and use of space resources. By founding the Luxembourg Space Agency⁷⁴ in 2018, Luxembourg has endowed itself with a dynamic structure of support for its space policy. This five-pillar programme addresses the specific needs of the sector: intensified support for sustainable development of companies, including the facilitation of access to space; implementation of the required policy and financing instruments; development of national talent in space systems and their commercialisation; the implementation of measures to

⁶⁸ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2019/06-juin/14-schneider-meluxina.html

⁶⁹ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2018/09-septembre/13-5g.html

⁷⁰ For more details see: <http://legilux.public.lu/eli/etat/leg/loi/2017/05/17/a544/jo>

⁷¹ See chapter 4.2 The R&D objective and key measures for achieving it.

⁷² For more details see: <http://www.spaceresources.public.lu/en.html>

⁷³ For more details see: <http://legilux.public.lu/eli/etat/leg/loi/2017/07/20/a674/jo>

⁷⁴ For more details see: <https://space-agency.public.lu/en.html>

facilitate recruitment and implementation of a promotion and communications strategy for LSA and the Luxembourg spatial ecosystem. This pioneering approach has already made it possible to reap the economic benefits in the short term following the establishment of new space companies in Luxembourg.

At the end of 2017, the government adopted the smart specialisation strategy for Luxembourg⁷⁵ that recommends specific action plans to be implemented for priority sectors, i.e. manufacturing industry 4.0, clean technologies including sustainable construction, smart mobility and the circular economy, health technologies and ICT. The ICT sector and the circular economy occupy a particular position as they provide the foundation for an innovative economy and a smart society.

With a view to promoting the establishment, acquisition, extension, modernisation and rationalisation of companies offering the required guarantees of viability, which are well managed and form part of the country's economic structure, a support scheme for SMEs that will make investments was established by the law dated 9 August 2018 relating to an aid scheme for small and medium-sized enterprises⁷⁶. This aid scheme offers additional ways to assist and support SMEs in their creation, development or reorientation phases. The Grand-Ducal Regulation dated 12 October 2018 that sets out the nomenclature of expenditure and companies eligible for the aid scheme⁷⁷ provided for by law was subsequently adopted. The aid scheme for SMEs is part of Luxembourg's economic diversification strategy. Entrepreneurship in Luxembourg has benefited from a wide range of support instruments over the last few years, but financial support remains a key element in helping new businesses make the initial investments.

In addition to all the measures listed above, the 2018-2023 government programme provides for a whole series of measures to further stimulate private investment, entrepreneurship and the creation of start-ups, some of which are listed below:

The government will analyse introducing tax measures to encourage investments by private individuals in innovative companies. In addition, the government will explore the possibility of introducing tax incentives for investments that meet the goals of sustainable development and climate transition. The benefits of such investments will be proportionate to the taxable income and risks taken by these taxpayers.

At the industry level, R&D efforts and investments, including energy efficiency, will be encouraged to stabilise modern state-of-the-art industrial activity.

An investment fund specializing in the space sector was launched in early 2020 through a public-private partnership (PPP). It will take stakes in space companies to promote their emergence in Luxembourg by developing and rounding out the national ecosystem.

The reform of bankruptcy and controlled management legislation will be completed as soon as possible⁷⁸. This reform will be implemented by focusing on prevention initiatives aimed at companies in difficulty and on collaboration between all the administrations concerned. In this context, fostering business creation must also depend upon diminishing the fear of failure as the main obstacle to entrepreneurship. Here, the legislation on the right of company establishment and its application must be reviewed in order to offer a second chance to entrepreneurs emerging from a period of

⁷⁵ For more details see: <https://meco.gouvernement.lu/dam-assets/publications/rapport-etude-analyse/minist-economie/ris3/luxembourg-research-and-innovation-smart-specialisation-strategy-2017.pdf>

⁷⁶ For more details see: <http://legilux.public.lu/eli/etat/leg/loi/2018/08/09/a882/1o>

⁷⁷ For more details see: <http://legilux.public.lu/eli/etat/leg/rgd/2018/10/12/a954/1o%20>

⁷⁸ For more details see: <https://gouvernement.lu/dam-assets/documents/actualites/2018/12-decembre/Accord-de-coalition-2018-2023.pdf>

entrepreneurial failure. This revision of this legislation will have to take into account strict repression of fraudulent bankruptcies.

In addition to the substantial increase in the number of requests in general, requests made under the Fit for Digital programme (support for the competitiveness of SMEs in devising and implementing a digital strategy) have also increased significantly since the pilot phase in 2016. The 67 requests in 2018 represent a significant increase over the number of files in 2017.

3.1.3.2 Skills development⁷⁹

The work force in Luxembourg is atypical in an international comparison. Domestic employment currently includes around 45% of non-resident border workers and the balance is made up, almost equally, of domestic and foreign residents with immigrant backgrounds. The Luxembourg economy therefore largely depends on a non-indigenous workforce and their skills for its development, either cross-border workers or foreigners establishing residence in Luxembourg. For Luxembourg, due to its small size, there is both a quantitative need for foreign labour, as the country does not have a sufficient number of workers to meet the demand for labour, and a qualitative need, in terms of skills that Luxembourg itself cannot provide. Over the years, this phenomenon has grown in importance and the shortage of labour with sought-after skills is becoming more and more evident, to the extent that it is often cited by companies in Luxembourg as one of the major obstacles to their development.

Box 4: ESC opinion - Cross-border work: history, present situation and forecasts⁸⁰

In early 2020, the Economic and Social Council (ECS) published an initial opinion on cross-border work in Luxembourg. The Greater Region and the phenomenon of cross-border work are of such importance to Luxembourg that the ECS deemed it necessary to devote a series of opinions to it, including this first, which describes this vital contribution to the economic and social landscape of Luxembourg and forms its basis. The ECS notes that from an economic and demographic point of view, Luxembourg needs highly qualified personnel. So far, Luxembourg has drawn from the labour pools of the Greater Region. However, the complexity and sophistication of the services offered, above all in the services sector, require very specific profiles that are no longer available.

The ECS will now look into more specific issues related to cross-border work in 2020 in greater detail: taxation, social security, regional planning and labour law.

To this end, the government began to develop a new national strategy in 2019 for attracting, developing and retaining talent. It is not only necessary to attract talent from abroad to Luxembourg; the country must also accelerate the development of expertise at a national level. To this end, a task force was set up to consult with the private sector on a coordinated national strategy to attract and retain talent, as well as to consider on how to develop skills for the future locally. Various measures have already been taken toward this goal: the regulatory framework governing immigration procedures, communication campaigns and participation in specialised recruitment fairs.

The government has developed an ambitious school infrastructure programme to deal with the constant increase in the number of students, which requires school infrastructure to meet the challenge, providing the optimal environments to stimulate motivation and learning, diversifying academic programmes in all regions of the country and to offering quality-training courses that address the different requirements of students⁸¹. Accordingly, the government is investing €1.3 billion in building two new schools, for new construction in eight existing schools and in five extension / redevelopment projects. In addition, 40 school infrastructure projects are under way.

⁷⁹ See Chapter 4.1 "The Employment objective and the key measures for achieving it" and Chapter 4.4. "The Education objective and the key measures for achieving it".

⁸⁰ For more details see: <https://ces.public.lu/dam-assets/fr/avis/themes-europeens/VC-Avis-Travtransfr-Hist-Pres-Prev-220120-13022020.pdf>

⁸¹ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/articles/2019/07-juillet/04-bausch-meisch-infrastructure.html

In 2019, in line with the political objectives emanating from the “Subgroup on Digital Skills of the Digital Single Market Strategic Group” attached to the “Working Group: Coordinated Plan on Artificial Intelligence” and to the “Member States Group on Artificial Intelligence” of the European Commission, and in line with the Government’s Strategic Vision Artificial Intelligence of May 2019, Luxembourg has adapted its digital skills strategy to bolster its promotion of advanced digital skills.

Growing investments in research and industrial activity linked to digital technologies such as artificial intelligence, High Performance Computing, 5G, Blockchain and cybersecurity now require new skills. For this reason, the government’s Digital Luxembourg initiative encourages continuing education in artificial intelligence for students, job seekers, data specialists and experienced ICT professionals. In October 2019, the government signed a cooperation agreement with NVIDIA for an “AI Lab” with public research centres in the country. In January 2020, a collaboration between Luxembourg and the German “KI-Campus” initiative was successfully established. A number of research projects in the field of Deep Learning and Natural Language Processing are currently in progress. Academic and industrial training in Deep Learning are an offshoot of this cooperation. In addition, to facilitate the gradual introduction of “coding” into the official school programme until September 2021⁸², Digital Luxembourg, together with the Technological Innovations Coordination Service (SCRIPT) of the Ministry of Education, has implemented a number of coding initiatives for young people⁸³.

In the same vein as the major concepts initiated by the European Commission, in 2019 the Digital Luxembourg initiative, together with the Chamber of Commerce and the Chamber of Trades launched the “Digital Skills and Jobs Coalition”. The number of events organized and the growing number of members joining the “Digital Coalition” (www.digitalcoalition.lu) testify to the success of this formula.

3.1.3.3 Sustainable transport⁸⁴

The government plans to invest €2.21 billion in its rail system between 2018 and 2023. In addition, Luxembourg’s railway (CFL) has just concluded the largest rolling stock purchase contract in its history, worth €400 million, set for delivery between 2020 and 2023. Investments in the tram system will amount to €390 million over the 2018-2023 period⁸⁵.

At the same time, the national RGTR bus network is currently undergoing a complete reform. The objectives of the reorganization of the RGTR network are the prioritisation and optimisation of regional bus lines, the improvement of services on Sundays and public holidays and the improved evening frequency. In addition, the Ministry is pursuing a “no-emission” objective until 2030 by putting electric buses into service on the RGTR network.

In Luxembourg, the government and network managers monitored the installation of 800 public charging stations for electric cars as well as for chargeable hybrid electric cars (plug-in hybrid cars). The installation of public and non-public charging stations for these cars is continuing rapidly. In January 2020, 350 “Chargy” charging stations and 55 “Chargy OK” charging stations were installed across the country⁸⁶

The tax deductions for electric vehicles were replaced on 1 January 2019 by direct and higher financial assistance. At the end of 2019, the financial assistance programme was extended until the end of 2020⁸⁷. Thus, for example, a subsidy of up to €5,000 will be available for the purchase of a new 100% electric car.

⁸² For more details see: <http://www.men.public.lu/catalogue-publications/themes-transversaux/dossiers-presse/2019-2020/200206-einfach-digital.pdf>

⁸³ For example : <http://www.techschool.lu/>, <http://railsgirls.com/luxembourg.html>, <https://www.codestart.lu/>

⁸⁴ See Chapter 4.3.1 Objective “Greenhouse gas emissions” and key measures to achieve it.

⁸⁵ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2019/01-janvier/21-bausch-transport.html

⁸⁶ See chapter 4.3.2 Renewable energies objective and the key measures for achieving it

⁸⁷ For more details see: <http://legilux.public.lu/eli/etat/leg/rgd/2019/12/20/a904/jo>

3.1.3.4 Housing supply

The new government notes that house prices continue to rise steadily, despite a multitude of positive actions by previous governments. To remedy this, it will have to invigorate low-cost public housing programmes, particularly rental housing. To achieve this goal, the 2018-2023 government programme plans to launch a concerted public action and private initiative as an adequate response. The priorities of public action will focus on the following points:

- A complete overhaul of the amended law of 25 February 1979 on housing assistance and the system of subsidies for creating housing, with an increase of resources for augmenting the supply of low-cost rental housing;
- Boosting the creation of social housing and low-cost housing;
- Providing more building plots;
- Bolstering current resources to increase the supply side, to include land use plans, municipal development and protection of the environment;
- Development of a new 2.0 “State-Municipalities” Housing Pact aiming to better support municipalities wishing to implement a housing development strategy;
- Better quality of urban areas, quality of life and social cohesion in neighbourhoods, as well as improving quality in construction and energy projects, to include the habitat biology in general;
- Preventing land speculation and improving price transparency in the rental market.

Municipalities will be more involved in reducing the shortage of housing alongside the two existing public players, the Housing Fund and the National Low-Cost Housing Company (SNHBM). To support the municipalities, special units will be established within the Ministry of Housing to advise municipalities in managing their own subdivision projects. This support will be used to support municipal action on the acquisition and development of land, creating housing, the sale or rental of land / housing and management of rental assets. The Klimapakt model will serve as a guide, by providing the municipalities with professional housing advisers, and this approach will be combined with the expertise of private initiatives.

With regard to making land available, the pre-emption right of the State, municipalities and public developers will be analysed and, if needed, simplified and modified as required. The point is to generalize the right of pre-emption at a price fixed at the moment when a subsidized project is realised (public or private), in case the respective property is sold. Overall, available land potential for residential development in the near future is sufficient for the creation of a significant number of dwellings. Therefore, the requirement is to better identify factors in the way of project development and improve the incentives to sell for owners. Only in the medium and long term, it will be necessary to make additional land available provided that it is developed in the short term.

Municipalities' ongoing commitment to the creation of social and low-cost housing will be acknowledged by additional financial incentives for these municipalities, possibly by linking the number of state subsidies to a system of graduated subsidies of up to at 100% of costs.

The government programme calls for the acquisition of land slated for housing. Consequently, the Ministry of Housing has set up a unit responsible for evaluating land with a view to a possible acquisition made up of representatives of the Ministry of Housing and the Ministry of Finance. In this way, the state was already able to acquire a few plots during 2019. In 2020, the State will set up a special fund to support housing development, through which it intends to pursue an active land acquisition policy. Capital gains and profits on sales of land will be exempt from income tax.

The property tax reform, which will act to counter land speculation, will be linked to the overhaul of the new generation General Development Plans (PAG). An exemption of a portion of real estate tax on

property inhabited by their owners will be introduced. The reform of the property tax system will prove to be an opportunity to replace and simplify the system of the municipal tax on unoccupied property or property not allocated for the construction of certain buildings.

3.1.4 Tax system

“Address features of the tax system that may facilitate aggressive tax planning, in particular by means of outbound payments.”

Measures aimed at combating aggressive tax planning

Luxembourg has for a long time been involved in the fight against tax fraud and tax evasion. In the past years, Luxembourg has regularly strengthened its legislative framework in taxation by far-reaching measures with the specific objective of thwarting aggressive tax planning.

More specifically, Luxembourg has in place a framework for the effective exchange of tax information that guarantees administrative cooperation between tax authorities at European and international level and that enables to effectively fight tax fraud and tax evasion. This framework ensues from the transposition of several directives in the area of administrative cooperation (DAC 1, 2, 3, 4 and 5) which incorporate globally accepted standards in the area of tax transparency. DAC 6 directive allowing the automatic exchange of information relating to certain aggressive cross-border tax planning schemes has just been transposed into Luxembourg law. Thanks to its deterrent and preventive effect, reporting of information on aggressive tax planning arrangements is likely to effectively contribute to efforts to create a more equitable tax environment.

The transposition during the years 2018 and 2019 of the ATAD 1 and ATAD 2 directives containing anti-tax avoidance provisions entailed the introduction and strengthening in Luxembourg law of certain mechanisms to combat aggressive tax planning. In this context, it is notably worth mentioning the substantial strengthening of anti-hybrid mismatch rules that aim to counteract the effects of practices aimed at taking advantage of the subtleties or inconsistencies between two or more tax systems.

In addition, the Multilateral Convention to implement tax treaty related measures to prevent BEPS (“Multilateral Instrument” or “MLI”) was ratified in 2019 by Luxembourg. Introducing a certain number of minimum standards in the double taxation conventions concluded by Luxembourg, including in particular the so-called “Principal Purpose Test”, the Multilateral Instrument specifically strengthens the legal framework in Luxembourg to combat aggressive tax planning structures resorting to treaty shopping.

In recent years, Luxembourg has also adapted certain provisions of Luxembourg tax law in addition to the measures mentioned above with the view to counteract certain types of undesirable behaviour. More specifically, in 2018, adjustments were made to two legislative provisions which, as result of taxpayers’ interpretation may have favoured base erosion and profit shifting practices, and even lead to situations of non-taxation of certain types of income. These changes contribute to strengthening the level of protection against aggressive tax planning in the internal market. These measures enable Luxembourg to require the taxpayer to prove that the other State also recognizes a permanent establishment before granting an exemption on the basis of the applicable double taxation convention. They also allow to eliminate the tax-exempt exchange or conversion of loans into shares⁸⁸ (section 16(5) of the Tax Adjustment Act and article 22bis of the Luxembourg Income Tax Law/L.I.R.).

⁸⁸ Amendments to paragraph 16 (5) of the Tax Adjustment Law as well as article 22bis of the amended law of 4 December 1967 concerning income tax through PL 7318.

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

Measures on outbound payments

With regard to the issue of outbound payments as mentioned in recommendation no. 4, it is worth noting more specifically draft bill no. 7547, that was approved by the State Council on 25 March 2020 and submitted to Parliament on 30 March 2020. The Luxembourg Government intends to pass this bill before the end of 2020, so that the measures proposed therein will become applicable as from 1 January 2021.

Aiming to put an end to tax planning practices that may still exploit certain provisions of the tax system in connection with outgoing payments, this measure directly addresses the recommendation of the Council of the European Union that requests Luxembourg "to address features of the tax system that may facilitate aggressive tax planning, particularly through outbound payments."⁸⁹

Consisting in the refusal to grant deductions of interest or royalty expenses paid or due by a taxpayer residing in Luxembourg to a related company established in a non-cooperative country or territory for tax purposes that appear on the list, as updated annually under the amended law of 4 December 1967 on income tax, the measure thus contributes to combating certain aggressive tax planning structures which result in outbound payments of interest and royalties being made by companies located in Luxembourg to such jurisdictions where they escape tax or where they are subject to low levels of tax insofar as these payments - more particularly towards jurisdictions with no corporate tax system or which use nominal zero or close to zero corporate tax rates - are not subject to any further tax, or are only lightly taxed, in the jurisdiction of the recipient⁹⁰.

The effectiveness of this measure to address situations of low taxation or double non-taxation lies in the adjustment of the Luxembourg tax base by inclusion of interest or royalty payments made to the jurisdictions concerned, thus significantly reducing any incentive for a resident taxpayer to set up financing structures involving such jurisdictions.

All of the aforementioned measures, which are already applicable in Luxembourg law, as well as the draft bill no. 7547, thus constitute an adequate and decisive response by Luxembourg to the recommendation no. 4.

⁸⁹ Council recommendation of 9 July 2019 concerning the 2019 Luxembourg national reform programme stating an opinion by the Council on the Luxembourg 2019 stability programme.

⁹⁰ See also the European Commission's 2020 Report for Luxembourg, published on 26 February 2020 as part of the 2020 European semester.

4. Progress achieved in national objectives for the Europe 2020 strategy

It is important to note that a large part of this chapter was drafted before the spread of COVID-19 in Europe. Certain measures could be modified following actions taken to deal with the spread of this pandemic.

The European Council decided on the new Europe 2020 strategy at its June, 2010 meeting, confirming the five major EU objectives that will make up the common goals steering EU action in the areas of promoting employment, improving conditions for innovation and R&D, achieving objectives in the area of climate change and energy, improving education levels and promoting social inclusion, essentially by reducing poverty. Each Member State had to determine its national objectives reflecting the above-stated European objectives. Luxembourg is determining its national objectives for 2020 and a series of measures to implement them as part of its NRP.

Table 3: National objectives determined by Luxembourg (April 2020)

		European objective 2020	Luxembourg objective 2020
Priority 1 "Smart growth"	<i>Objective 1</i>	<i>"(...) raising combined public and private investment levels in this sector to 3% of GDP"</i>	2.3-2.6%
	<i>Objective 2</i>	<i>"(...) reduce school dropout rates to less than 10 %"</i>	sustainably under 10% (a)
		<i>"(...) increasing the share of persons 30-34 years old having completed a university degree or equivalent level of studies to at least 40%"</i>	66% (b)
Priority 2 "Sustainable growth"	<i>Objective 3</i>	<i>"(...) reduce greenhouse gas emissions by 20% (...)"</i>	reduction of GHG outside of EU ETS by less than 20% compared to 2005, i.e. emissions of around 8,117 Mt CO ₂ in 2020) (c)
		<i>"(...) increase the share of renewable in final energy consumption to 20%"</i>	11% (c)
		<i>"(...) move towards a 20% increase in our energy efficiency"</i>	Use of final energy of 49,292 GWh, i.e. 4,239,2 ktoe
Priority 3 "Inclusive growth"	<i>Objective 4</i>	<i>"(...) raise to 75 % the employment rate for women and men aged 20-64"</i>	73%
	<i>Objective 5</i>	<i>"(...) remove at least 20 million people out of the risk of poverty and exclusion" »</i>	reduce the number of persons under the threat of poverty or social exclusion by 6,000 persons by 2020 (d)

Notes:

(a) National data will also be used as measurement tools because the indicator calculated by Eurostat out of the Labour Forces Survey is not totally representative of Luxembourg. Statistics must be provided that better distinguish persons having attended Luxembourg schools in order to be able to assess the quality of the national education system for the national resident population and to provide information about the capacity of the Luxembourg school system to educate young people.

(b) Luxembourg intends that this indicator provide data on the capacity of the national education system to educate young people who can earn post-secondary school diplomas rather than it being a reflection of post-secondary qualifications requirements of the labour market. In Luxembourg there is a strong disparity according to birth country; according to Eurostat, the rate for foreign residents is near 60% and that of native citizens is just under 40%, while in neighbouring countries the difference between the two populations is much less marked.

(c) With regard to greenhouse gases and renewable energies, strict national objectives were already in place prior to the launching of the Europe 2020 strategy. For the post-Kyoto 2013-2020 period, only the sectors outside of EU ETS are targeted by objectives set amongst Member States. This emissions reduction objective excluding ETS is stated for 2020 as compared to the 2005 level.

(d) With regard to methodology, the indicator used under the Europe 2020 strategy does not take the demographic factor sufficiently into account at the national level. In fact, Luxembourg's demographics are very dynamic, even during difficult times, such that the relative nature of the indicator used as a percentage of population inevitably gives rise to an increase in the absolute number of persons concerned. The government is also supporting this goal through measures that increase the employment rate of women and single-parent families in particular, with a view to achieving a 73% employment rate.

4.1 The Employment objective and the key measures for achieving it

European objective: “aiming to raise to 75% the employment rate for women and men aged 20-64, including through the greater participation of young people, older workers and low-skilled workers and the better integration of legal migrants.”

4.1.1 National target

Luxembourg's objective for 2020 is to achieve an employment rate of 73%. According to the latest available data, Luxembourg is very close to reaching this objective with an employment rate of 72.8% in 2019.

The continued increase in the employment rate over recent years is primarily due to wider participation of women in the labour market. The employment rate of women increased from 58.4% in 2005 to 68.4% in 2019, which translates into an increase in the share of female employment in domestic wage employment by 37.9% in 2005 to 40.7% in 2019.

Table 4: Statistics of the labour market in Luxembourg

	2005	2010	2014	2015	2016	2017	2018	2019
Domestic employment	287,178	337,406	371,489	381,316	393,036	406,104	421,992	437,354
Percent of cross-border workers	41.2 %	44.3 %	44.2 %	44.5 %	44.9%	45.0%	45.5%	45.9%
Percent of women	37.9 %	39.3 %	40.5 %	40.6 %	40.5%	40.5%	40.6%	40.7%
Total employment rate [20-64]	69.0 %	70.7 %	72.1 %	70.9 %*	70.7%	71.5%	72.2%	72.8%
Employment rate: Men	79.4 %	79.2 %	78.4 %	76.7 %*	76.1%	75.3%	76.5%	77.2%
Employment rate: Women	58.4 %	62.0 %	65.5 %	65.0 %*	65.0%	67.7%	67.8%	68.4%
Employment rate: Youths [20-24]	44.0 %	35.5 %	33.3 %	44.1 %*	40.3%	41.9%	46.4%	44.5%
Employment rate: Youths [25-29]	81.3 %	81.5 %	81.0 %	80.9 %*	81.8%	81.4%	79.3%	83.1%
Employment rate: Seniors [55-59]	46.8 %	55.7 %	58.1 %	55.9 %*	57.2%	56.3%	55.2%	61.1%
Employment rate: Seniors [60-64]	12.7 %	20.1 %	23.1 %	16.5 %*	17.8%	19.5%	22.0%	22.0%
Unemployment rate (LFS)	4.6 %	4.6 %	6.0 %	6.5 %*	6.3%	5.5%	5.3%	5.6%

Source: STATEC; Eurostat-LFS

4.1.2 Key measures

Apart from the measures that are part of the implementation of EU Council recommendations in the area of employment, the government continued its efforts to achieve the national objective. These efforts focus particularly on supporting job seekers targeting vulnerable groups, especially youth, women, seniors, persons with specific needs and the long-term unemployed. To achieve this, national

employment policy promotes high quality, sustainable and inclusive jobs, and supports measures and actions designed to eliminate precariousness and poverty, thus seeking to obtain improved living conditions and a sustainable social model. The various measures and actions are prepared and implemented in close coordination with the concerned ministries and departments to ensure a concerted horizontal approach that promotes the synergies between the various measures.

The government will implement a genuine skills strategy in order to align training with the skills required in the various economic sectors and to guide people towards the right training throughout life. An accreditation agency will be created to promote the quality of continuing vocational training and to ensure transparency in the continuing education market.

The speed of technological transformation poses a challenge in terms of jobs and skills. Operational conclusions will be made after an initial evaluation of the Digital Skills Bridge pilot project⁹¹. On this basis, the articles relating to maintaining employment - based on which this project was founded - will be adapted and supplemented with a view to pursuing it, while broadening its scope of application. In any case, the legislation on job retention will be developed, in particular in relation to career paths, training and investment in skills.

Training for job seekers is a priority area of the employment policy. ADEM continues to work closely with companies to produce multiple specific training programmes that overcome skills deficits on the labour market and give the perspective of a specific job. ADEM has formed partnerships with the major training institutions in Luxembourg to this end⁹².

In attempting to facilitate the insertion of women into jobs, it is essential to emphasize promoting reconciliation between professional and family life. Under the 2015-2018 Action plan for gender equality, the law dated 15 December 2016 strengthens the principle of equal salaries by gender⁹³. Awareness-raising actions as well as positive actions in this area are being implemented to eliminate barriers to employment and ensure equality. The reform of parental leave and paternity leave facilitates reconciling work and family life.

The personalised process for job seekers is now fully rolled out. This new way of working enables ADEM to improve job seeker support quality, to manage a constantly increasing number of files and to customize the follow-up of job seekers in order to integrate them in the most rapid and sustainable manner into the labour market. On 9 March 2016, the ADEM officially launched a new interactive platform - the "Job Board" - which aims to increase the chances of meeting between employers and job seekers and encourages the autonomy of job seekers⁹⁴. In addition, ADEM's Employer Department and the permanent dialogue under way with the private sector as part of the "Business, Partners for Employment" programme make it possible to better adapt ADEM's offers, particularly training, to business needs. With this in mind, UEL and ADEM renewed their partnership for a further three years (2018-2020). In addition, ADEM has continued to invest in vocational training for job seekers.

It should be noted, however, that the ongoing negotiations at European level concerning the coordination of social security systems, and more particularly the unemployment benefits component, could generate major disruptions in the public employment service in Luxembourg by potentially doubling the number of job seekers registered at ADEM⁹⁵.

⁹¹ For more details see: <https://www.skillsbridge.lu/>

⁹² House of Training, Chambre des Métiers, Luxembourg Lifelong Training Centre (Chambre des Salariés), National Institute for Public Administration (INAP).

⁹³ Law dated 15 December 2016 on the amendment of the Labour Code; amendment of article 2 of the law dated 21 December 2007 on the regulation of the financing of political parties <http://legilux.public.lu/eli/etat/leg/loi/2016/12/15/n2/jo>

⁹⁴ Presentation of the new "JobBoard": https://adem.public.lu/fr/actualites/adem/2016/mars/JobBoard_presentation.html

⁹⁵ Given the very specific situation of the employment market in Luxembourg, the paradigm shift in unemployment benefits in the context of border work will cause a considerable increase in the administrative and financial burden.

The Youth guarantee programme⁹⁶, officially launched in June 2014, has been continuously developed and improved, especially regarding the launching mechanism for NEETs, youths who are not in employment, not in education, not in training programmes and not in an academic course. Of the young people who enrolled in the programme, 85% received high quality job offers⁹⁷. The ADEM youth services have extended their scope to persons up to age 30.

The draft law on the regulation of work placement aims to introduce a high quality and transparent environment⁹⁸. Work placement play an important role in training and career counselling. The new framework will facilitate the transition between the spheres of education and work while ensuring the quality of work placement and the legal certainty of the various stakeholders.

Job seekers from immigrant communities often do not have a good command of at least one of the languages used in Luxembourg. Therefore, ADEM has developed its internal language training programme and developed partnerships externally to offer job seekers more courses. In close coordination with the competent public authorities and the private sector, ADEM is also pursuing skills evaluation programmes for refugee job seekers. These assessments make it possible to identify skills that have already been acquired and guide job seekers towards appropriate training to fill any gaps in their skills profile.

The implementation of the measures and actions developed in favour of sustainable professional integration, job retention and social inclusion are supported by the 2014-2020 Operational Programme of the European Social Fund (ESF). The current operational programme puts greater focus on young people under 30, including those from an immigration background, people who are far removed from the labour market who need better social inclusion and job seekers and employees over 45.

Moreover, the ESF projects particularly focus on new jobs in the ITC sector by enhancing the acquisition of new skills of workers and job seekers.

4.2 The R&D objective and the key measures for achieving it

European objective: "improving the conditions for research and development, in particular with the aim of raising combined public and private investment levels in this sector to 3% of GDP (...)."

4.2.1 National target

Implementation of an effective RDI policy for both the public and private sectors is a priority for the Luxembourg government. The government has set a range of between **2.3% to 2.6% of GDP** as a national objective for R&D intensity for the year 2020. The government programme for 2018-2023 provides that public investment in research and innovation, both public and private, reflected by the budgetary resources of the State, will be increased to 1% of GDP. Research spending in the public sector will be 0.8% of GDP for 2023.

The government's RDI budgets have continued to increase, in both the public and private sectors, with allocations rising from €23.6 million in 2000, representing 0.13% of GDP, to €368.5 million in 2018, 0.61% of GDP.

Table 5: Changes in budget allocations for RDI from 2000 to 2018

Year	2000	2006	2008	2010	2012	2014	2016	2018
€ million	23.6	102.5	167.9	218.1	267.4	317.5	336.0	368.5
% GDP	0.13	0.34	0.49	0.54	0.60	0.63	0.61	0.61

Source: www.statistiques.public.lu

⁹⁶ For more details see: <http://jugendgarantie.lu/>

⁹⁷ ADEM figures for the period of January to September 2018.

⁹⁸ For more details see: [Projet de loi 7265](#)

Private R&D spending in Luxembourg has diminished over the last 18 years, while public sector spending has steadily increased. The share of public research increased from 7.5% of total expenditure in 2000 to almost 44% in 2018. This change is one consequence of the political actions of governments since 1999, including the setting of objectives for the development of research intensity expressed through expenditures objectives, the establishment of a National Research Fund (FNR) and of the University of Luxembourg, and the introduction of multi-annual agreements governing relations between the state and public higher education and research institutions.

Table 6: Changes in gross domestic expenditures and in intensity of research by sector

Year	Public research (€ millions)	Intensity (%GDP)	Private research (€ millions)	Intensity (%GDP)	Total (€ millions)	Intensity (%GDP)
2000	27.5	0.12	337.0	1.46	364.5	1.58
2005	64.0	0.21	408.0	1.36	472.0	1.57
2006	78.5	0.23	485.0	1.43	563.5	1.67
2007	96.6	0.26	495.0	1.33	591.6	1.59
2008	136.8	0.36	482.0	1.26	618.8	1.62
2009	149.6	0.40	470.7	1.27	620.3	1.68
2010	203.7	0.51	400.0	1.00	603.7	1.50
2011	215.2	0.50	416.2	0.96	631.4	1.46
2012	251.0	0.57	310.4	0.70	561.4	1.27
2013	287.8	0.62	317.9	0.68	605.7	1.30
2014	298.4	0.60	331.9	0.67	630.3	1.27
2015	320.6	0.62	357.5	0.69	678.0	1.30
2016	317.1	0.58	395.0	0.72	712.1	1.30
2017	318.7	0.56	402.0	0.71	720.7	1.27
2018	321.4	0.54	406.0	0.68	727.4	1.21

Source: www.statistiques.public.lu

The structure of the Luxembourg economy partly explains the relatively low R&D intensity in the private sector. The business sectors that represent the bulk of the Luxembourg economy, namely services and in particular the financial sector, traditionally invest less in R&D⁹⁹. In this context, it must not be forgotten that R&D only constitutes an input indicator and that an equally important indicator is output, which encompasses innovation, marketing of new products, implementation of new procedures, etc. Luxembourg performs generally better in this area.

4.2.2 Key measures

a. Measures for achieving the nation's target in public research

In general, the government aims to align its national RDI policy more with that of the European Research Area (ERA), the objective of which is to create a real single market for knowledge, research and innovation and whose new paradigm is currently being discussed at European level. The revised ERA objectives and priorities will focus on the following five challenges: creating a dynamic knowledge flow; demonstrating the societal relevance of the ERA; advocating a new growth and sustainable development model focused on R&I; establishing the link between research and innovation (R&I) and various relevant horizontal and sector policies; exploiting the benefits of the diversity of European R&I systems.

⁹⁹ See 2017 NRP. For more details see: <https://gouvernement.lu/dam-assets/fr/publications/rapport-etude-analyse/minist-economie/observatoire-de-la-competitivite/programme-national-de-reforme/2017-pnr-luxembourg-2020/2017-pnr-luxembourg-fr.pdf>

Recently, in order to increase the efficiency of the research system, the government approved the National Research and Innovation Strategy for Luxembourg¹⁰⁰. This strategy describes the national research priorities, with four priority areas (Industrial and service transformation / Personalised healthcare / 21st Century Education / Sustainable and responsible development), in which implementation will place special emphasis on interdisciplinary projects, and sets the general framework that will provide for a targeted development of Luxembourg's research ecosystem.

In developing the strategy, the 17 Sustainable Development Goals put out by the United Nations were also taken into account. Implementation of the strategy will call for mission-oriented research targeting societal challenges in line with sustainable development objectives, in the priority areas defined above.

With regard to State allocations of the University of Luxembourg and the public research centres (CRP) under agreement for the period 2018-2021, it was decided to draw up quadrennial agreements, accompanied by a medium-term review clause (before the end of 2019). This revision made it possible to apply adjustments that the government considered appropriate. To this end, following this mid-term review, the State's financial commitment for 2020 and 2021 was revised upwards by €7 million for 2020 and by €9 million for 2021.

Like the previous contracts, the 2018-2021 agreements include a description of the missions and of the strategic objectives that the institutions propose to achieve, and the indicators used to measure achievement of these objectives. Indicators can be classified into three categories: financial indicators, performance indicators and structural indicators.

An institutional performance-based bonus has been introduced. An additional envelope is intended to reward research teams and groups that have been successful in the EU's highly competitive research and development framework programme, Europe's largest research programme. The introduction of this element of objective performance reward clearly bolsters the quality and excellence aspect of research institutions as well as their international dimension, thus also addressing one of the recommendations of the 2016 OECD report.

Table 7: State grants included in multi-annual agreements

(Mn €)	2018	2019	2020	2021	Total 2018-2019
University (Including Medical)	176.33	190.24	211.01	225.31	802.89
LIST	42.90	45.04	48.55	51.36	187.85
LIH	33.02	35.85	39.60	43.26	151.73
LISER	11.01	11.50	12.90	14.00	49.41
FNR	64.80	64.79	66.79	69.03	265.41
Bonus	/	4.50	7.00	9.00	20.50
Total:	328.06	351.92	385.85	411.96	1477.79

In addition, the National Research Fund has established a strategy and action plan for public research for 2018-2021 based on OECD recommendations following the review of Luxembourg's innovation policy in April 2015. Scientific excellence will remain the key criterion in all of FNR's mechanisms, but it will be coupled with strategic considerations and will emphasise generating economic and societal impact through research.

¹⁰⁰ For more details see: <https://gouvernement.lu/dam-assets/documents/actualites/2020/02-fevrier/25-mesr-strategie-recherche-innovation/mesr-strategie-recherche-innovation.pdf>

The National Research Fund has developed different thematic and structural funding instruments to support research projects in the priority areas of Luxembourg. The CORE programme, for example, is the main FNR programme for funding research projects and aims to stimulate scientific excellence in the priority areas set out in the national research and innovation strategy. ATTRACT aims to attract outstanding researchers with between two and eight years of post-doctorate work and PEARL (senior level) scientists in fields strategically relevant for Luxembourg. The FNR's INTER Mobility programme is intended to support incoming and outgoing geographic mobility, as well as cross-sector mobility between the public and private spheres. The PRIDE programme aims to support the development of a critical mass in a certain field of research and technological development by allocating a block of doctoral scholarships to a consortium of researchers involved in a coherent research and training programme.

The National Research Fund continues its efforts to optimize the dissemination, accessibility and transfer of scientific knowledge via the JUMP Programme (formerly PoC), open to all areas of research, which aims to make innovative research results from public research institutions more attractive to potential investors by offering financial support up to commercialisation/utilisation. The Knowledge & Innovation Transfer Support (KITS) programme provides competitive funding to Luxembourg public research institutions to attract and integrate knowledge transfer specialists (TTO).

In addition, the National Research Fund supports and coordinates activities that make open data available, aimed at strengthening the link between science and society and raising awareness about research: 'Science in Society & PSP', 'FNR Awards', 'RESCOM', 'PUBLIC' and the 'Open Access Fund'.

Transnational cooperation is partly supported by bilateral agreements between the National Research Fund and various foreign partners to support projects amongst researchers based in Luxembourg and abroad (e.g. ANR, BELSPO etc.). The FNR is also a member of a number of research networks and associations offering multilateral research opportunities (e.g. EUROSTARS, COST, Science Europe, ENRIO etc.).

To optimise the dissemination, accessibility and transfer of scientific knowledge, the National Library of Luxembourg as part of its mission as a national documentary platform and service provider for documentation centres and public sector libraries, has been increasing and will continue to develop its offer of digital scientific publications accessible on-line. It actively supports the transformation towards "Open Access" through the activities of the Luxembourg Consortium, together with the public research players and the National Research Fund. In order to optimise the dissemination and accessibility of scientific knowledge, in 2019 it concluded a framework agreement with the University of Luxembourg, as well as cooperation contracts with the National Research Fund, the Training Institute of National Education (IFEN) and the Service for Coordination of Educational and Technological Research and Innovation (SCRIPT) of the Ministry of Education.

The Ministry of Culture has set up a digital strategy for national cultural heritage, one of the priorities of which is to give wide access to digital objects of this heritage, in particular to the target group of researchers. To this end, it supports the institutes in charge of publishing enriched data founded on an Open Data policy. These data are made available within the framework of cooperation projects with research organizations, including the University of Luxembourg.

b. Measures for achieving the nation's target in private research

The total intensity of R&D expenditure in relation to GDP as described in ODD9 increased from 1.30% to 1.21% between 2013 and 2018. The percentage of private R&D expenditure has remained stable at around 0.68%, with a peak at 0.71% in 2017. However, it should also be noted that, in absolute terms, private R&D expenditure increased significantly during 2013-2018 (+28%). In an effort to overcome

this situation, the government is continuing to promote RDI in the private sector, reinforcing technological skills, access to public research and the digitisation of businesses via specific measures. The coming into force of the new RDI Promotion Act¹⁰¹ in June 2017 gives the government access to a series of tools to effectively support businesses in their RDI approach. This law allows action on companies of all sizes as well as at different levels of the innovation chain. It also makes it possible to reinforce SME innovation via a specific regime. In addition, it offers a strong incentive for the establishment of collaborative research between companies and with public players. Finally, companies can pool their efforts to create research synergies based on the scientific community via the research infrastructure scheme. Support for innovative start-ups is again available, which is an essential lever in the policy of support for the start-up ecosystem.

In addition to these tools, the development of a digital economy strategy published in 2019, aims at coordinating innovation and infrastructure implementation policies in order to ensure a trust-based secure data economy. This data-driven innovation strategy is fully in line with the framework set up by the Third Industrial Revolution (TIR) in Luxembourg but also meets the framework of Sustainable Development Objective 9 - ODD9, by bridging the digital divide and by promoting access to information and communication technologies. It will be important to identify areas of development and innovation in the priority sectors that are underpinned by data processing. Certain flagship projects and measures already in place have been incorporated into this strategy, which should boost spending in private sector RDI:

- High Performance Computing (HPC) and big data enabled applications: Luxembourg's access to HPC capabilities falls within the framework set by the TIR. Because Luxembourg's dossier was selected by EuroHPC, 35% of the costs are being met for acquiring a petaflop machine hosted in Luxembourg, based on a modular and innovative architecture using European technologies. At the same time, the implementation of a skills centre managed by the independent LuxProvide, whose mission is to support businesses, particularly SMEs, throughout the value chain leading to the development of their data and to develop skills required in the field of HPC (High Performance Computing), simulation and Big Data, addresses the national strategy for implementing the HPC infrastructure and Big-data enabled applications.
- Industry 4.0: With the support of Cluster Materials and Manufacturing, a business awareness campaign was conducted to guide them towards data exploitation and enhancement.
- The Digital innovation Hub (L-DIH) resulting from a partnership between the Ministry of the Economy, FEDIL, Luxinnovation, the Chamber of Commerce, the Luxembourg Institute of Science and Technology and the National Research Fund, is a support element of the data-driven innovation strategy, a platform that offers companies access to expertise in digital strategy, technological implementation, training and management of digital knowledge.
- The Fit4Digital programme, whose objective is to ensure the digital transformation of companies (programme reserved for VSEs), and an SME support programme carried out with the support of Luxinnovation.

At the same time, flagship projects have been implemented in the strategic sectors:

- **National Composites Centre Luxembourg**: This is a centre whose operational concept is based on close cooperation between public and private players. Following the opening of this centre in 2016, a non-profit organization was created in February 2018 made up of industrial operators and Luxinnovation, which was intended to guide and promote its activities. Furthermore, a mixed group of researchers and entrepreneurs was tasked with setting research orientations and

¹⁰¹ The purpose of the law is: 1. the renewal of aid schemes for research, development and innovation; 2. the tasks of the National Agency for the Promotion of Innovation and Research; and modifying the amended law dated 5 June 2009 on the promotion of research, development and innovation.

analysing market requirements for composite materials. Its activities should provide significant leverage in this sector. A number of multi-lateral research projects should be completed in 2020.

- **Joint Research Programme:** In cooperation with the FNR, the objective of this programme currently being developed is to promote solid public-private partnerships on a long-term basis between Research and Technology Organisations and industries in areas deemed priority by the government. The first calls for projects should be launched in 2020.

In addition to these flagship projects, new measures were taken and actions pursued to relaunch RDI activities over the long term and to stimulate investment in knowledge capital:

- The tasks of the Luxembourg Intellectual Property Institute (IPIL)¹⁰² were determined upon its establishment under the form of an Economic Interest Group in 2014¹⁰³. In addition to its crucial role of coordinating the implementing public policy with regard to intellectual property, IPIL has been operational since 2015 and is able to support the proper management of research and innovation projects. Accordingly, in addition to support for the proper management of intellectual property in research projects, the patent information search and technological or competitive monitoring services keep it constantly updated with technical information in a particular area and provide strategic and operational support for all purveyors of innovative projects. The use of these specific and highly specialised services makes it possible to avoid duplicating research already carried out elsewhere, determine prior art and identify trends and technical developments in a particular field, to monitor new developments in a technology and to monitor competitors' innovation activities. In addition, the 2018-2023 government programme stresses that intellectual property rights must be taken into account in a cross-functional manner, particularly as part of the digital innovation strategy for the development of a sustainable, data-driven and trusted economy. The government insists on the need to encourage companies and stakeholders to integrate intellectual property aspects into their R&D strategies and to enable them to value their products, so that these efforts result in competitive advantages that ultimately benefit the entire Luxembourg economy.
- The Luxembourg Cluster initiative is active in the following themes: *Healthtech, Eco-Innovation, ICT, Materials & Manufacturing, Automobility, Wood and Creative Industries*; it should stimulate synergies and emulation between its members, strengthen links between business and research and encourage innovation and exchanges of technologies. A reform carried out in 2019 aiming to set up a cross-sector management of clusters will improve their visibility and their impact with Luxembourg companies, in particular with the implementation of flagship projects emanating from an ideation process between representatives of industry, research and public administrations.
- Supporting start-ups continued through the *Fit4Start* coaching and start-up financing programme, which has been stepped up, with 30 participating start-ups. The mechanism has since diversified beyond the ICT sector, with five start-ups in the Biotech sector and five in the Space sector who were also able to benefit from their start-up phase. At the same time, Luxembourg is continuing to support the implementation of hosting infrastructures dedicated to start-ups in strategic sectors such as Healthtech and Ecotech. The ICT Digital Tech Fund dedicated to innovative companies, with public and private commitments amounting to €20.3 million, continued making investments. To improve visibility, the startupluxembourg.com site lists the different players in the Luxembourg ecosystem.

¹⁰² Federate the actors involved, develop and offer support and support services for companies, players in the research field, public institutions and any other interested public, develop and provide training as well as promotional and awareness-raising activities and conduct projects and studies to advise the government.

¹⁰³ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2014/08-aout/01-conseil-gouvernement.html

- Support for SMEs and incentives for innovation are reinforced through the establishment of a chain of programmes to support SMEs in growing innovation: the *Fit4Innovation* programme and its *Inno4Growth* and *Inno4Circularity* components contribute to helping SMEs become more competitive in order to free up resources for innovation, supporting businesses to participate in the SME instrument of the Horizon 2020 programme and the Innovation Club as a forum to highlight key success factors for innovation, as well as for bringing out new ideas. In 2017, RDI projects were implemented by companies that had never had such projects before participating in the *Fit4Innovation* programme.
- With regard to activities promoting and supporting innovation, the following measures were put in place: an innovation portal centralising all information on RDI¹⁰⁴; a site developed which includes all innovative solutions originating in Luxembourg intended to promote the use of innovative solutions in public contracting; the magazine HAPPEN promotes technological excellence and the innovation mentality in Luxembourg internationally; domestically, www.Horizon2020.lu offers a full panorama of European programmes and provides guidance for players who want to participate in this arena. As a national contact point, Luxinnovation advises and supports researchers and companies, it stimulates them to participate in several training and information workshops such as *Horizon 2020 Day* as well as the *Fit4Horizon2020* measure intended to promote Luxembourg participation in European programmes by covering a part of the costs of preparing a project proposal.
- In addition to the measures put in place to strengthen partnerships between researchers and businesses, several funding programmes have been established by the National Research Fund, such as BRIDGES (formerly CORE-PPP), Industrial Fellowships (formerly AFR-PPP), the Industrial Partnership Block Grant as well as the JUMP and KITS programmes.

4.3 The Climate change and energy objective and the key measures for achieving it

European objective: “reducing greenhouse gas emissions by 20% compared to 1990 levels; increasing the share of renewables in final energy consumption to 20%; and moving towards a 20% increase in energy efficiency.”

Box 5: Integrated National Energy- and Climate Plan (NECP)

Building on the winter energy package that the European Commission proposed in 2016, the European Parliament and Council Regulation on the governance of the energy union and climate action¹⁰⁵ provides for Member States establishing integrated national energy and climate plans for the period 2021-2030 (NECP). These integrated plans are important planning and monitoring tools, and address the following five dimensions: decarbonisation, including the renewable energy component; energy efficiency; security of the energy supply; the internal energy market; research, innovation and competitiveness. Through its integrated national plan, which includes a strategic part and an analytical part, each Member State adopts national objectives in terms of renewable energies, energy efficiency and reduction of greenhouse gas emissions by 2030 and describes the policies and measures that will enable it to achieve these objectives.

Luxembourg’s NECP presents objectives, as well as detailed policies and measures underpinning them, which will have the potential to lead to genuine energy transition and to profound changes concerning the use of energy in all sectors. It also designates the budgets necessary to accelerate

¹⁰⁴ For more details see: www.innovation.public.lu

¹⁰⁵ Regulation (EU) 2018/1999 of the European Parliament and of the Council dated 11 December 2018 on the governance of the Energy and Climate Action Union, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22 / EC, 98/70 / EC, 2009/31 / EC, 2009/73 / EC, 2010/31 / EU, 2012/27 / EU and 2013/30 / EU of the European Parliament and of the Council, Council Directives 2009/119 / EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council.

the energy transition in Luxembourg, which must take place against a backdrop of a highly dynamic growth in terms of economic activities, mobility and demography.

The table below summarizes the main objectives and measures of the NECP.

	2030 OBJECTIVES
Greenhouse Gases	<ul style="list-style-type: none"> National climate target: 55% (compared to 2005) Introduction of a framework climate law
Energy efficiency	<ul style="list-style-type: none"> Energy efficiency target between 40% and 44% High energy retrofit rate Efficient and quality renovation of existing buildings Electromobility
Share of renewable energies	<ul style="list-style-type: none"> Share of renewable energies in gross final energy consumption: 25% Monitoring of tenders for large photovoltaic installations Enhanced cooperation with other EU Member States
	MEASURES for 2030
Decarbonisation	<ul style="list-style-type: none"> Introduction of a framework climate law Development of the climate pact with the municipalities Introduction of a minimum carbon price and adjustment of the taxation on petroleum products Reform of the motor vehicle tax and the tax on official vehicles Gradual abandonment of heating oil
Renewable energies	<ul style="list-style-type: none"> Solar offensive: large photovoltaic installations, development of a solar and thermal registry Increase of self-consumption in the electricity sector Adaptation and extension of aid schemes Targeted expansion in the field of heat produced from renewable energies (heat pump, deep geothermal energy, renewable district heating networks from residual heat) Electromobility, second generation biofuels, green hydrogen Cooperation with other EU Member States
Energy efficiency	<ul style="list-style-type: none"> Low energy and positive energy buildings Ambitious renovation of the inventory of existing buildings Strengthening of the voluntary agreement with the industrial sector and its development for SMEs, the continuation and extension of the energy efficiency obligation (EEO)

	<ul style="list-style-type: none"> Increased energy efficiency in the transport sector through reduced traffic, massive expansion of public transport and rapid development of electromobility
Energy security	<ul style="list-style-type: none"> Strengthening regional cooperation Transportation network expansion measures for existing lines Reduced dependence on petroleum imports
Internal energy market	<ul style="list-style-type: none"> Intelligent management at all levels of electrical voltage through the establishment of an energy data hub No development of gas infrastructure: existing infrastructure is of adequate size Active support for gas distribution companies in the construction of green gas (biogas) infrastructures
Research, innovation and competitiveness	<ul style="list-style-type: none"> Overhaul of a research infrastructure involving all stakeholders in the field of research and innovation Continued increase in investments in energy research and development Strengthening the efforts and capacities of national research institutes Luxembourg as an international hub for climate solutions

4.3.1 Greenhouse gas emissions objective

4.3.1.1 National target

This objective is based on European Council decisions within the context of the “Climate and Energy Package” of March 2007. Greenhouse gas (GHG) reductions for Luxembourg are at 20% by 2020 with relation to the year 2005 in the sectors not covered by the EU Emissions Trading System (ETS)¹⁰⁶.

In accordance with Regulation (EU) No 525/2013, the latest inventory of GHG emissions in Luxembourg covers the period 1990-2018. For 2018, GHG emissions amounted to 10.55 million tonnes of CO₂ equivalent (Mt CO₂e) (excluding international air transport and forest and land-based emissions and removals - LULUCF), or 311,000 tons of Co₂e, 3% more than in 2017, mainly due to an increase in emissions from road transport. Compared with 2005, a record year since the beginning of the 2000s, emissions have even decreased by 2.46 Mt CO₂e (-18.9%).

¹⁰⁶ Appendix II of Decision No 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020. Also see Chapters 4.3.2 and 4.3.3.

Table 8: Changes in GHG emissions, excluding LULUCF for selected years (in million tons of CO₂e)

Source:	1990	1995	1998	2000	2005	2010	2015	2016	2017	2018	2018-2005	2018-2017
electricity and heat production and distribution	0.04	0.09	0.16	0.12	1.24	1.20	0.46	0.25	0.24	0.22	-82 %	-7.9 %
industrial production	7.91	4.36	2.08	2.18	2.13	1.94	1.74	1.81	1.80	1.83	-14.3 %	1.3 %
road transport: domestic fleet	0.85	1.04	1.16	1.22	1.44	1.61	1.71	1.73	1.75	1.89	31.1 %	7.9 %
road transport: road fuel exports	1.74	2.30	2.73	3.63	5.74	4.90	3.99	3.80	3.89	4.13	-27.9 %	6.2 %
households, businesses and services	1.32	1.40	1.57	1.63	1.63	1.66	1.57	1.63	1.70	1.64	0.4 %	-3.7 %
agriculture	0.73	0.74	0.73	0.72	0.66	0.69	0.70	0.71	0.72	0.71	9 %	-1 %
other sources	0.15	0.16	0.19	0.17	0.17	0.16	0.13	0.12	0.12	0.12	-27.9 %	-1.6 %
total GHG emissions, excluding LULUCF	12.74	10.09	8.62	9.67	13.01	12.17	10.29	10.05	10.24	10.55	-82 %	-7.9 %

Source: Environment Agency of the Ministry of the Environment, Climate and Sustainable Development - submission dated 15 March 2020

For the second post-Kyoto 2013-2020 period, only the sectors outside of EU ETS are targeted by objectives set amongst Member States. For Luxembourg, this emissions reduction objective excluding ETS amounts to -20% for 2020, compared to 2005 levels. This objective is to be met along a linear trajectory for which the starting point, in 2013, is comprised of average emissions excluding ETS for 2008 to 2010. These yearly budgets are represented by annual allocations of emissions allowances (AAQE). Thus, for 2020, emissions outside ETS should be limited¹⁰⁷ to 8,117 million tons of CO₂.

The latest official projections of Luxembourg's GHG emissions were transmitted to the European Commission in March 2020 and reflect those submitted by Luxembourg in its "National Integrated Energy-Climate Plan 2021-2030" (NECP) – see Box 5. Luxembourg estimates that for the period 2013-2020 it could release an emission reserve of around 0.44 Mt CO₂e in the central scenario with existing measures and 1.65 Mt CO₂e in the central scenario with additional measures. In this case, the use of external credit should not be necessary. However, calculations of "reserve" or "deficit" are accompanied by a great deal of uncertainty because they are very sensitive to the expected changes for a particular source of emissions, namely road transport, which alone accounts for almost two thirds of total emissions excluding ETS.

¹⁰⁷ Given the adjustment stipulated in Article 10 of Decision No 406/2009 / EC as published in the Commission Implementing Decision dated 31 October 2013 (2013/634 / EU) and the adjustment recorded by Commission Decision 2017/1471 dated 10 August 2017 amending Decision 2013/162 / EU to revise the annual allocation of emission allowances for Member States for the period 2017-2020. Amount stated as GWP in the Fourth IPCC Report in effect as from the 2015 inventory submissions.

**Table 9: Indicative trajectory for GHG emissions, excluding LULUCF & ETS
under EC decision 406/2009/EC (in million tons of CO₂e)**

	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
total GHG emissions, excluding LULUCF	13.01	12.17	12.05	11.77	11.23	10.78	10.29	10.05	10.24	10.55	9.59	9.05
emissions from aviation (domestic flights) – CO ₂ only	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
verified ETS emissions (CITL)	2.60	2.25	2.05	1.99	1.85	1.93	1.66	1.50	1.49	1.47	1.42	1.38
total GHG emissions, excluding LULUCF and excluding ETS - ESD version	10.41	9.92	9.99	9.78	9.37	8.86	8.61	8.52	8.74	9.08	8.17	7.68
annual emission allocations - Decisions 2013/162 / EU and (EU) 2017/1471					9.81	9.61	9.41	9.20	8.99	8.78	8.57	8.36
contribution to the adaptation of ETS (Art. 10 ESD)					0.28	0.27	0.27	0.26	0.25	0.25	0.24	0.24
annual adjusted emission allocations (Art. 10) - Decisions 2013/634 / EU and (EU) 2017/1471					9.54	9.34	9.14	8.94	8.74	8.53	8.32	8.12
emissions deficit (+) or reserve (-) compared to annual allocations of emission allowances					-0.17	-0.48	-0.53	-0.42	0.01	0.55	-0.16	-0.44
emissions deficit (+) or reserve (-) compared to annual allocations of emission allowances - cumulated 2013 - 2020												-1.65

Source: Environment Agency and Ministry of the Environment, Climate and Sustainable Development, based on the 2020v1 submission - 2005 to 2018 - *and projections with additional NECP measures for non-ETS emissions - 2019 and 2020*

Notes: CITL ETS emissions come from the EU Emissions Trading System data viewer of the European Environmental Agency - <http://www.eea.europa.eu/data-and-maps/data/data-viewers/emissions-trading-viewer>. The total GHG emissions, excluding LULUCF and excluding ETS from 2013 to 2016 (underlined) are those used after the European Commission's compliance verification over the 2013-2020 period.

The annual emissions allocations are published in Appendix I of Commission Decision 2013/162/EU dated 26 March 2013 on determining Member States' annual emission allocations for the period from 2013 to 2020 pursuant to Decision No 406/2009/EC of the European Parliament and the Council (ESD). Data adjusted for Article 10 of Decision 406/2009/EC were published in an Implementing Decision 2013/634/EU dated 31 October 2013 and those modified to take account of the methodological changes induced by the use of revised guidelines for calculating inventories were published in Commission Decision 2017/1471 of 10 August 2017.

4.3.1.2 Key measures¹⁰⁸

The government has access to a broad range of instruments to achieve the reduction of GHG emissions not pertaining to ETS in accordance with existing rules. In particular, the second action plan to reduce CO₂ emissions contains numerous measures relating to transport, building, energetic efficiency and renewable energies, to industries, to information and awareness campaigns and to consultancy and energy training. However, this second Action Plan, which is aimed primarily at the period 2013-2020, will be replaced by the Luxembourg National Integrated Energy-Climate Plan 2021-2030 (NECP), as required by the European Parliament and Council regulation on the governance of the Energy and Climate Action Union ¹⁰⁹. The NECP will be accompanied by a framework climate law that aims to achieve zero net emissions by 2050, using targeted sector targets.

According to the NECP, the promotion of renewable energy sources - see section 4.3.2 - and the improvement of energy efficiency - see section 4.3.3 - constitute the main foundations of Luxembourg's climate policy and the energy transition.

¹⁰⁸ Also see Chapters 4.3.2 and 4.3.3. as well as 3.1.3.3 "Sustainable transport"

¹⁰⁹ Regulation (EU) 2018/1999 of the European Parliament and of the Council dated 11 December 2018 on the governance of the Energy and Climate Action Union, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22 / EC, 98/70 / EC, 2009/31 / EC, 2009/73 / EC, 2010/31 / EU, 2012/27 / EU and 2013/30 / EU of the European Parliament and of the Council, Council Directives 2009/119 / EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council.

The NECP formalises a national target of reducing greenhouse gas emissions by 55% compared to 2005 for the sectors not covered by the EU emissions trading scheme (EU ETS) by 2030. This objective is mainly the result of significant efforts to improve energy efficiency and promote renewable energies. It is higher than the 40% entered for Luxembourg in the Regulation of the European Parliament and of the Council relating to binding annual reductions in greenhouse gas emissions by the Member States from 2021 to 2030¹¹⁰.

Since a dominant two-thirds of non-ETS greenhouse gas emissions are currently produced by the road transport sector, a continual decline in sales of road fuels is unavoidable. Reinforced promotion of public transport and active mobility will also help limit emissions in the transport sector, as will the Community legislative framework setting performance standards in terms of CO₂ emissions for passenger cars and light commercial vehicles (reductions of 37.5% and 31% respectively in 2030 compared to 2021) as well as for heavy goods vehicles (reduction of 30% in 2030 compared to 2020).

In the area of transport, the government seeks a genuine change of paradigm through the implementation of actions and projects proposed through its overall sustainable mobility (MoDu2.0) strategy. The ongoing works for the commissioning of a tramway in Luxembourg City are emblematic of this change. MoDu 2.0 aspires to the development of public transportation, to more intense use of the soft mobility concept and to the establishment of a near real time Public Transport Telematics System. This strategy, with the Transportation Sector Plan (PST) that covers it, also recommends a series of other measures such as the installation of a high capacity and high frequency transport system in the capital, the promotion of electric-based mobility or the introduction of an ecological mobility label for companies.

The government programme plans to provide free national trains, trams and buses as from the first quarter of 2020. Rates for cross-border transport will be reduced after consultation with the neighbouring SNCB, DB and SNCF networks. Rates will also be reduced on the RGTR transportation network "RegioZone". This will benefit not only residents but also cross-border residents. Free mobility has been in place since February 29, 2020.

In the interest of reducing greenhouse gas emissions and protecting the climate an initial increase in excise duties on road fuel was implemented in May 2019; the government is now implementing a second increase¹¹¹, which should be between 1 and 3 cents for petrol, and between 3 and 5 cents for diesel. The increase will take effect between February and April 2020. The budgetary revenue derived from this increase in excise duty will be used to support measures for energy transition and to support social equity.

With regard to residential buildings, apart from the implementation of the sector housing plan (PSL), an ambitious schedule has been prepared for progressively strengthening requirements in terms of energy performance in new buildings and residences. Accordingly, since 1 January 2017 all new residential construction is now generally required to meet the AA energy class standard, which is the nearly-zero energy use building standard, making Luxembourg one of the precursors in the EU to require this type of criterion. The cost of housing in Luxembourg has been rising sharply in recent years and as energy renovation is often quite expensive, in 2017 the government set up a "climate bank". This initiative is part of a "climate bank and sustainable housing bonus" published at the end of 2016, through which the government has implemented new mechanisms to simultaneously promote sustainable construction, sustainable energy-efficient renovation of existing residential buildings and

¹¹⁰ Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual reductions in greenhouse gas emissions by the Member States from 2021 to 2030 contributing to climate action in order to comply with the commitments made under the Paris Agreement and amending Regulation (EU) No 525/2013.

¹¹¹ For more details see: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2019/12-decembre/16-augmentation-accises.html

enhancement of renewable energies in the housing sector. In particular, this involves the following measures:

- “Climate bank”: a climate loan at a reduced interest rate and a zero-interest climate loan for the most disadvantaged households that seeks to promote sustainable energy-efficient renovation even more and prepare for energy insecurity.
- Reform of the PRIMe House financial aid scheme: new, more attractive bonuses to promote the construction of sustainable housing and sustainable energy renovation.
- A certification system for sustainability of new housing (LENOZ): this certificate reflects the level of sustainability ultimately achieved by housing units.

With regard to administrative buildings, the government intends to progressively reinforce energy performance requirements for new administrative buildings of this type – see Chapter 4.3.3.2. The government intends to establish new financing methods to achieve the gradual renovation of all existing buildings and has already conducted an inventory of central government buildings covered by the European directive on energy efficiency.

Industrial entities that are susceptible to emitting substantial GHG quantities are involved in the Community Emissions Trading Scheme. Furthermore, the government has set up a system of energy audits in large corporations and is encouraging ecotechnologies. In addition, a voluntary energy efficiency agreement with Luxembourg industrial companies was initiated in 1990 and has been in effect since then - see section 4.3.3.2.

Through the Climate Pact, the government is offering technical and financial support to municipalities in an effort to reinforce their role as models in climate policy, to reduce greenhouse gas emissions and their energy bills and to stimulate investment on a local and regional level and, since 2016, to ensure improved air quality. The Climate Pact has been highly successful, as illustrated by the participation of nearly all municipalities. The circular economy concept has been incorporated into this since 1 January 2018.

In the field of spatial planning, the revision of the Master Programme for Spatial Planning (PDAT), which sets out an integrated strategy for sector policies having an impact on territorial development and which determines the guidelines, political objectives as well as measures of the government and municipalities to be taken within the framework of the objectives of Article 1 of the Law of 17 April 2018 concerning spatial planning, is pursued in order to: provide optimal living conditions for the entire population by valorising and developing all parts of the national territory in a sustainable way; guide and concentrate territorial development in the most suitable places of the territory; observe and monitor territorial developments and ensure the coordination of municipal, inter-municipal, national, cross-border and international sector policies that have an impact on territorial development; ensure an efficient use of land as well as concentric and coherent urban development, and encourage the municipalities to develop common strategies. In addition, the new law concerning spatial planning provides for conventions of territorial co-operation between the State and municipalities designed to encourage municipalities to develop and implement inter-municipal or cross-border strategies and to contribute to implementing the plans and programmes of spatial planning. One of the priority objectives of the work of these conventions of territorial co-operation between the State and municipalities is to promote the use of sustainable means of transport. Now the development of Leitbilder (strategic visions) has been launched for the Nordstad and the Southern region, with both of these visions to be included in the new PDAT.

4.3.2 Renewable energies objective

4.3.2.1 National target

Directive 2009/28/EC of 23 April 2009 on the promotion of the use of energy from renewable resources calls for Luxembourg achieving an 11% share of energy from renewable sources in its gross final consumption for 2020 as well as an objective of 10% share of energy from renewable resources in the transport sector for 2020. Luxembourg is on track to reach its 2020 targets. In 2018, the share of renewable energy in final consumption reached 9.06%, compared to 6.29% in 2017 and 5.44% in 2016. In recent years, Luxembourg has continued to increase its share of renewable energy and in 2018 reached its indicative trajectory for the 2017-2018 period, thanks in particular to the use of cooperation mechanisms. The contributions to this objective by the various sectors were 9.13% for electrical energy and 8.78% for heat and cooling production. The portion of renewable energy used in transportation came to 6.54%. Thus, the overall increase in final consumption of renewable energies in Luxembourg excluding cooperation mechanisms in 2018 (6.72%) is slightly higher than the expectations of the national action plan for renewable energies (6.60% excluding cooperation mechanisms).

4.3.2.2 Key measures

The national action plan in the area of renewable energies sets out three areas for achieving the national objective in this domain:

- Developing renewable energy within the country by means of producing electricity and heat/cooling from renewable sources.
- Adding biofuels into fuels for domestic use as well as developing public and private electric mobility.
- Use of the cooperation mechanisms, primarily through statistical transfers and joint projects with other Member States and third countries.

The measures, as well as the planned schedule, are described in this action plan. The principal recent actions taken as part of these measures that have an impact on the development of renewable energies are outlined below:

Spread in the use of renewable energies on national territory

In the domain of energy performance of residential buildings, as of 1 January 2017, new residential buildings are generally required to meet the highest energy performance class of AA, which corresponds to the nearly zero energy use building standard. The new requirement levels also contain an implicit incentive to implement renewable energies. With regard to new administrative buildings, the requirement of the standard of buildings with almost zero energy consumption will be introduced on 1 January 2021.

The modified Grand-Ducal Regulation of 1 August 2014 relating to production of electricity based on renewable energy sources implemented a remuneration system in the form of feed-in tariffs and market premiums for producing electricity based on renewable energy sources, while taking into account the requirements laid down in the guidelines on State aid for environmental protection and energy for the period 2014-2020 of the European Commission (hereinafter "Guidelines").

The last amendment to the Grand-Ducal Regulation entered into force on 12 April 2019 and aims to refine the current provisions and improve the existing framework to allow for accelerated deployment of facilities based on renewable energy sources on national territory, in particular by revising the tariffs for photovoltaic facilities upwards.

An initial call for tenders for large photovoltaic installations was launched on 24 February 2018 and resulted in an allocation of 15.16 MWp out of the 20 MWp out for bid. Estimates predict annual production of around 14 GWh for this first tender. The first three installations with a capacity of 1.8 MWp put electricity onto the grid for the first time at the end of 2019.

The second call for tenders was launched in September 2019 and tenders could be submitted until 16 March 2020. Following the result of the first tender, adjustments were made in the design and specifications taking into account the feedback from participants in this call for tenders. Five tender sections are now planned for a total called power increased to 40 MWp. Interest in this tender was growing and a full allocation of the tender capacity could be expected.

After an in-depth analysis of the first two experiences, a multi-year calendar of tenders will be drawn up to address the aspirations of the National Energy and Climate Plan (see Box 5).

Mix of biofuels in fuel available for consumption nationally

Through a modification to existing legislation, the rate of biofuels mixed with gasoline and diesel has been set at 7.70% for 2020. Directive 2009/28/EC stipulates that in 2020, it will be mandatory to include a minimum share of 10% of renewables in the final energy consumption for transportation, so that the share of biofuel will have to be continuously increased. The contribution of biofuels produced from waste, residue, non-food cellulosic material or from lignocellulosic material is considered equivalent to double that of other biofuels. In 2019, the minimum rate of these "double counted" biofuels to be added in gasoline and diesel was 35% and is 50% for 2020.

Electric mobility

In Luxembourg, the government and network operators monitored the installation of 800 public charging stations for electric cars as well as for chargeable hybrid electric cars (plug-in hybrid cars). The first of these 800 "Chargy" public charging stations were installed 2017. A total of 350 "Chargy"¹¹² charging stations have been installed within the country by January 2020. In addition, 55 charging stations accessible to the public and managed by the same common central system set up for public charging stations, called "Chargy OK", have been installed across the country. Around 5,000 people subscribe to the "Chargy" platform, whose terminals are equipped with a uniform means of identification using the "mKaart" from "Verkéiersverbond", a multifunctional smart card. When recharging their electric cars or plug-in hybrids, subscribers consumed around 81,000 kWh per month in 2019, which is equivalent to a distance of around 405,000 km driven entirely on electric vehicles per month. Provided by distribution grid operators, the installation of 800 terminals for 100% electric cars as well as for plug-in hybrid vehicles is gradually planned through until the end of 2020. A total of 400 terminals will be installed in particular on Park and Ride facilities, allowing commuters to switch to public transport, and 400 on public parking spaces and public parking in municipalities in locations throughout the country.

In addition to charging stations accessible to the public, the Ministry of Energy and Regional Planning and the Ministry of Mobility and Public Works have continued to develop a clear and coherent framework for non-public charging, for example at home or at work.

Use of cooperation mechanisms in the field of renewable energies

Directive 2009/28/EC provides for cooperation mechanisms to enable Member States to achieve their objectives through statistical transfers, joint projects, and joint support schemes. In 2017 Luxembourg

¹¹² For more details see: <https://chargy.lu/>

was the first EU Member State to conclude statistical transfer agreements with Lithuania and Estonia. For 2019, Luxembourg will have acquired for 2018 a total of 1,100 GWh amount of energy produced from renewable sources from the two countries (550 GWh from each of them) to achieve its intermediary objectives for 2017-2018 (see above). The amounts needed to reach its national target of 11% in 2020 have been provided for. It should be stressed that Luxembourg is the first country to use the cooperation mechanisms to ensure the achievement of its national objectives, which is a clear signal for increased European cooperation in the field of renewable energies.

4.3.3 Energy efficiency objective

4.3.3.1 National target (final energy use)

Luxembourg has set the objective for energy efficiency as follows: in annual final energy use not to exceed **49,292 GWh** in 2020, i.e. **4,239.2 ktoe** (or 52,111 GWh/4,481.6 ktoe of primary energy).

In addition to the energy efficiency objective, Luxembourg has also set an energy savings target of 5,993 GWh to be achieved by 31 December 2020 through a mechanism of energy efficiency obligations set up in 2015. The first period (2015-2020) of this mechanism will end on December 31, 2020. As announced in the NECP (Integrated National Energy- and Climate Plan, see chapter 4.3.4.), the Luxembourg government is determined to continue to optimise this mechanism of obligations in terms of energy efficiency for the period 2021-2030 in order to comply with the obligation of Article 7 of the amended directive relating to energy efficiency. Elaborating the mechanism for the second period (2021-2030) is under way and will be completed before the end of 2020.

Through Directive 2012/27/EU, the EU has put in place a common framework of measures to promote energy efficiency in order to achieve the EU's 2020 target. Measures in the areas of energy efficiency in the sectors of households, services, industry and transportation appear in the directive. The EEAP focuses on the administration and implementation of Directive 2012/27/EU and covers significant measures to improve energy efficiency and forecasted/achieved energy savings in supply, transportation, distribution and final use of energy up to 2020. The two main elements of the PAEE are a forecast of overall consumption by the final and primary energy sectors in 2020 and quantified measures whose objective is to improve energy efficiency and generate energy savings in upcoming years, for the purpose of achieving the national energy efficiency goal. At the end of 2018, Directive 2018/2002/EU amended Directive 2012/27/EU and put in place a common framework of measures to promote energy efficiency in order to achieve the EU's 2030 target. Transposition of this directive began in 2019 and will continue in 2020.

Available statistical data and the updated forecasts show changes in energy consumption that deviate from the objective that Luxembourg must reach in 2020, particularly due to a strong increase in the use (sale) of petroleum products. Corrective measures are being implemented in order to return to the planned trajectory for achieving the objectives.

4.3.3.2 Key measures

Energy performance in buildings

Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings reformulates the existing Directive (2002/91/EC) and provides a new "nearly zero energy use" standard for all new buildings for 2021 (2019 for public buildings). The "Nearly Zero Energy Building" (NZEB) legislation came into force on 1 January 2017 through the Grand-Ducal Regulation dated 23 July 2016 amending the amended Grand-Ducal Regulation dated 30 November 2007 concerning energy performance in residential buildings, which is the new energy performance

standard required for new residential buildings. NZEB energy efficiency standards generally correspond to buildings of the AA energy classes (thermal insulation and energy performance classes).

With regard to functional buildings, the transposition of this aspect of the directive is now being finalised. An amendment to the Grand-Ducal Regulation came into force in April 2019 and a draft Grand-Ducal Regulation concerning the energy performance of administrative buildings is under way to modify the methodology for calculating energy efficiency that incorporate new technical developments, and to reinforce the requirements of the NZEB, the new energy performance standard required for new administrative buildings.

The new Grand-Ducal Regulation for the NZEB standard for functional buildings is accompanied by updated software for calculating energy performance of functional buildings, simplifying calculation and establishing of energy performance certificates based on the Grand-Ducal Regulation.

Voluntary agreement with Luxembourg industrial companies

The Voluntary Agreement between the industrial sector, represented by FEDIL, the Luxembourg government and the G.I.E. My Energy was set up as early as 1990 with the aim of improving energy efficiency in Luxembourg industry. The current agreement was extended from 2017 to the end of 2020 and includes the participation of around fifty companies from the industrial and tertiary sectors. Provided that certain requirements are met and that the objective of improving the Community energy efficiency indicator by 7% for the 2014-2015 to 2020 period is reached within the framework of Directive 2003/96 /EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity, member companies will get some tax relief on electricity and natural gas. This voluntary agreement will be continued, broadened and extended beyond 2020 in order to attract more businesses, particularly in the area of SMEs. Better communication and cooperation between member companies will help identify and exploit potential synergies in the area of energy efficiency. An in-depth assessment of the current Voluntary Agreement will serve as a basis. This voluntary agreement will generate even more ambitious energy efficiency objectives by encouraging companies to implement the recommended energy saving measures, by providing them with the necessary assistance and with additional means for financing and completing projects.

Smart electric and gas meters

Luxembourg has continued monitoring the widespread installation of smart metering jointly by gas and electricity network operators. Since 1 July 2016, grid operators have been installing a smart meter for each new connection to their grids, and progressively replacing existing meters of each of their customers. As of end 2019, approximately 285,000 smart electricity meters and 60,000 smart natural gas meters have been installed nationwide. A total of 92% of the old electricity meters have been replaced. The target of 95% of meters, as provided for by law, will be reached in early 2020. With regard to natural gas, the replacement of at least 90% of the old meters will extend through to 31 December 2020.

Strategy to mobilize investment in the renovation of the national supply of buildings

The government has also pursued its long-term strategy to mobilize investment in the renovation of the national stock of public and private residential and commercial buildings under Directive 2012/27/EC. This strategy emphasizes the following points: priority for complete, highly energy-efficient renovations; affordability of energy renovation measures; improved coordination between energy policy and protection of heritage; promoting sustainable construction and the circular economy.

These guidelines are constantly considered when preparing projects, awareness and information policy, as well as legal or regulatory adaptations in the field of building renovation.

In addition, there are almost 35 measures aimed at reducing legal and financial obstacles, which have been examined and implemented as part of the work of the National Council for Sustainable Construction (CNCD). Priority was given to the following measures: removal of obstacles encountered by building managers, introduction of a compulsory renovation reserve fund for condominiums, adaptation of decision-making quorums for implementing renovation measures (introduction of a simple majority for condominium decisions), a pioneering role for municipalities in the field of building renovation (climate pact, financial aid, logistical aid, competitions, etc.), verification that the reduced rate of 3 % VAT is applied for buildings 10 (rather than 20) years old, promote the energy renovations in the stock of buildings by simplifying the administrative procedures of the “climate loan” and programmes to replace oil heating in old buildings.

This ambitious long-term renovation strategy will make it possible to revise the renovation rate upward by 3% yearly, as well as the scope of the renovation (“deep renovations”), so that by 2050 all existing homes meet the target of zero net emissions.

4.4 The Education objective and the key measures for achieving it

European objective: *"improving education levels, in particular by aiming to reduce school dropout rates to less than 10% and by increasing the share of 30-34 years old having completed tertiary or equivalent education to at least 40%."*

4.4.1 Early school leavers objective

4.4.1.1 National target

The government is pursuing the national goal of keeping the dropout rate below 10% for the long term and generally promoting academic success and lifelong skills development. Figures from the Labour Force Survey (LFS) show a positive development¹¹³. The rate is 9.3% (2015), 5.5% (2016), 7.3% (2017), 6.3% (2018) and 6.8% (preliminary figures for 2019).

For ten years, the government has been conducting a national study as a complement to the LFS. This data does not allow comparison at European level but can be used to identify dropouts at the level of the national system. Accordingly, more targeted intervention projects have been set up.

A new methodology is being applied to calculate the national school dropout rate. This allows a more direct calculation of the dropout rate and thus measures the impact of the policies put in place for the fight against dropping out within a very short time. The dropout rates under the new method for 2017/2018 and 2018/2019 were 5.8% and 6.0% respectively.

4.4.1.2 Key measures

The main measures revolve around the three action areas of prevention, intervention and building skills in the context of lifelong learning.

¹¹³ For more details see: http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=t2020_40&plugin=1

- Prevention

In 2019, the government continued its efforts to promote the academic success of an increasingly heterogeneous population, where the linguistic and socio-economic background is critical to student success¹¹⁴.

Reform projects in early childhood education and care introducing a multilingual educational programme¹¹⁵, care for children with special needs and at the secondary education level have been under way since the 2017-2018 school year, continuing into the 2018-2019 school year.

In secondary education, a series of laws was approved in 2017 to set the contours of a modern high school¹¹⁶.

The government continues to diversify its educational programme in public school to better adapt it to the heterogeneous profile of its population, by creating new forward-looking training, fine-tuning the linguistic offer and innovating in pedagogical matters:

- The European and international school programme in public education has expanded, now including international, European, French-speaking, English-speaking and even a German-Luxembourgish school, as well as classes with a specific linguistic regime.
- New training courses in sectors providing numerous professional opportunities are being implemented in high schools. These courses take into account technological developments related to electronics and robotic computing. These include technician training in "Smart Technologies" (Smart and Green Energy, Smart Home, electromobility, Internet of Things, communication networks, etc.) or training as a mechatronics technician to acquire a wide range of mechanical, electrical, electronics, IT, hydraulics and pneumatics skills.

The acquisition of digital skills is systematically anchored in basic and secondary education. The development of skills in coding and computational thinking are emphasised in the framework of the STEM disciplines (science, technology, engineering, and mathematics). Currently in testing at pilot schools, coding will be disseminated to all Cycle 4 classes as from September 2020 in the mathematics course; it will then appear in cycles 1 to 3, transversely, in the different academic branches. Beginning in September 2021, a new "Computer Sciences" course will integrate the timetable of all lower classes in general secondary education.

- French and English language programmes are extensive in the area of vocational training.

- Intervention

In this action area, the goal is to intervene as soon as a situation occurs that could potentially lead to a student abandoning studies. Two courses of action are recommended: the projects set up by services of the Ministry of Education, Children and Youth are involved in these: intervention and individualized monitoring of a student in difficulty and / or intervention at the level of an entire class, or even of a school.

¹¹⁴ See the OECD PISA results

¹¹⁵ For more details see: <http://www.men.public.lu/fr/actualites/publications/enfance/infos-generales/170320-plurilingue-petite-enfance/index.html>

¹¹⁶ For more details see: <http://www.men.public.lu/catalogue-publications/secondaire/informations-generales-offre-scolaire/modernisation-lycee/lycee.pdf>

Fifteen high schools offer vocational induction classes (CIP) at the beginning of the school year to young pupils who do not meet the criteria for access to higher classes of general secondary education or vocational training. Similar classes also accept minors who have already left the school system to enable them to undertake or get back into training courses.

The Psycho-Social and Scholastic Assistance Centre (CePAS) and the Psycho-social and Scholastic Assistance Service (SePAS)¹¹⁷ present in most of the country's high schools, together offer a very diverse range of measures aimed at fighting dropping out of school.

The local youth centres (ALJ) are part of the National Youth Service (SNJ) and their mission is to support young people in their transitions to working life. They are aimed at young people who are still in school, but who are on the verge of leaving without a specific plan, those who have left the school system without a diploma, who wish to return to school or a vocational training programme and who want to get out and do something.

The National School for Adults (ENAD) is aimed at 16 to 30-year-olds who have dropped out of school without obtaining recognised certification or who do not find an apprenticeship and offers them a new chance of success in the mainstream school system.

- Lifelong learning

Given the constantly changing labour market and societal challenges, the MENJE continues its efforts to develop a national offer of lifelong learning accessible to all and for all age ranges. The principle is to give everyone the opportunity to acquire basic skills, to continuously adapt their skills, to acquire a higher level of qualification ("upskilling") or to obtain a new qualification ("reskilling"). It is just as important to help young people who are dropping out of school as adults who do not have a recognized qualification to find training that meets their needs and allows them to round out their career or to reorient themselves. One priority will therefore be to obtain qualification for more people on the job thanks to continuing training, to the second path to qualification, partial certifications and the validation of prior experience ("upskilling").

In continuing vocational training, a collaboration with the Employment Development Agency (ADEM) is being planned to bring the National Centre for Continuous Vocational Training (CNFPC) into contact with the world of work in order to adapt or to round out programme offers. More training courses leading to certifications are being offered to accept more learners in courses adapted to their needs and the needs of their employers. The National Institute for the Development of Continuing Vocational Training (INFPC) is evaluating the training it is helping to promote.

A quality approach will be introduced to guarantee the quality and permeability of adult education and continuing education programmes. The platform www.lifelong-learning.lu, which focuses on programmes of continuing education and adult education and training in Luxembourg, will be restructured to allow personalized research according to learners' objectives. To promote access to and participation by adults in lifelong learning, an advisory, guidance and support service for adults in the area of training will be set up under the responsibility of the Service de la adult education. This service will complement the programmes offered of the Orientation Centre.

¹¹⁷ For more details see: <https://cepas.public.lu/fr/accompagnement-scolaire/prevention.html>

Box 6: Action plan for education in sustainable development

The Ministry of Education, Children and Youth (MENJE) engages in the dynamics of the objectives of sustainable development. The action plan for education in sustainable development is being revamped under the aegis of MENJE, in collaboration with the Ministry of Environment, Climate and Sustainable Development (MECDD), and the Inter-Ministerial Committee on Education for Sustainable Development (CIEDD). This plan will determine the objectives in terms of sustainable development for formal and non-formal education and outline the measures to be implemented to achieve them.

New training courses in environmental technologies are being created, such as the “Environmental Sciences” Section at the Technical High School of Ettelbruck (field of environment and ecology, environmental technologies, sustainable mobility, circular and responsible economy and of renewable energies) or a specialization in Architecture, Design and Sustainable Development.

Other areas of action include the creation of eco-responsible school infrastructures, participation in the solidarity economy and the reduction of waste and single-use plastics in schools.

4.4.2 Tertiary education objective

4.4.2.1 National target

The national **objective** consists of ensuring that **66%** of the population between the ages of 30 and 34 hold a higher education degree. This objective was set at the time when two out of three jobs in Luxembourg required higher education training. In 2018, this percentage rose to 56.2%, which represents a clear increase compared to 46.1% in 2010.

Table 10: Percentage of the population aged 30 to 34
with a university degree

2010	2012	2014	2016	2018
46.1%	49.6%	52.7%	54.6%	56.2%

Source: Ministry of Higher Education and Research

4.4.2.2 Key measures

The government is continuing its efforts to create a fertile ground for expanding the supply of public and private higher education programmes, as well as for consolidating the quality culture in the sector, based on the European standards, notably through a revision of the law on the organisation of higher education as foreseen in the 2018-2023 government programme. This revision will particularly aim at optimising the governance of the programmes leading to the professionally oriented higher education qualification “*Brevet de technicien supérieur*” (BTS) and at reviewing the accreditation and monitoring procedures for BTS programmes as well as for foreign higher education institutions and programmes in Luxembourg. At the beginning of the 2019-2020 academic year, eight courses offered by three private higher education institutions were accredited. For the same reference period, there were 30 accredited BTS programmes accommodating a total of 829 students.

With this goal of optimisation and consolidation in mind, Luxembourg expressed its interest in participating in the OECD project “Enhancing higher education system performance”, which involves carrying out a study of the Luxembourg higher education system. This assessment will feed into, amongst others, the reflections in the context of the development of the national strategy for higher education, with a particular focus on achieving better coherence between higher education and the labour market.

As for the University of Luxembourg, it should be noted that a first cycle of medical studies leading to the Bachelor's degree will start in 2020, which will thus contribute to a sustainable supply of doctors in Luxembourg. In 2018, the government signed an additional protocol on scientific and academic cooperation with the government of the French Republic, which provides for inter-university cooperation in Master's programmes in medicine and cooperation between universities and hospitals in the framework of the basic medical training and specialisations.

In the new multiannual agreement between the University of Luxembourg and the government, which relates to the institution's objectives for the period 2018-2021, the University commits to obtaining accreditation for several new Bachelor and Master degree programmes in order to guarantee and support high-quality education that corresponds to the trends in innovation.

The government continues to bolster its policy for higher education and research on the financial resources level. As a result, financial contributions to the functioning of the University of Luxembourg have grown considerably. The State's allocation for the functioning of the University increased from €72 million (2009) to €202.4 million in 2020.

The government also continues to promote inclusion in higher education. Among other things, it aims to increase the percentage of students with disabilities who graduate from higher education. The amended law of 27 June 2018 on the organization of the University of Luxembourg introduced a reasonable accommodation commission, aiming to set up a series of reasonable accommodation measures for students with special educational needs.

The number of students enrolled at the University of Luxembourg had stabilized for several years and has increased by around 5% for the 2019/20 academic year.

Table 11: Total number of students at the University of Luxembourg by academic year

Year	Number of students
2012-2013	6,308
2013-2014	6,231
2014-2015	6,309
2015-2016	6,189
2016-2017	6,153
2017-2018	6,366
2018-2019	6,423
2019-2020	6,714

Source: Ministry of Higher Education and Research

4.5 The social inclusion objective and key measures for achieving it

European objective: “promoting social inclusion, in particular through the reduction of poverty, by aiming to lift at least 20 million people out of the risk of poverty and exclusion. The population is defined as the number of persons who are at risk-of-poverty and exclusion according to three indicators (at-risk-of poverty; material deprivation; jobless household), leaving Member States free to set their national targets on the basis of the most appropriate indicators, taking into account their national circumstances and priorities.”

4.5.1 National target

The government supports the conclusions of the European Council in this objective through measures that contribute to increasing women's and single-parent families' rate of employment in order to arrive

at a **73% employment rate** in 2020. Access to employment creates the type of conditions that promote social inclusion and constitute a rampart from which to react against poverty and social exclusion, both for individuals and society in general. In the area of horizontal and transversal approaches, all the efforts detailed under the national employment and education objective headings are, together with the measures outlined below, also measures for contributing to promoting social inclusion, particularly by reducing poverty.

4.5.2 Key measures

Measures announced in the 2018 – 2023 government programme

The reconciliation of work and family life will remain a priority ambition of the government, which will respond to the need for flexibility of families and businesses through an ambitious policy in the areas of work organisation, social transfers and tax policy. Government action will continue to promote equal opportunities, including measures to combat the risk of poverty, especially for single-parent families, and to support parents in reconciling work and private life. Investments in families and children will continue, with emphasis on benefits in kind. Accordingly, primary school children will be accommodated and supervised free of charge in childcare centres during school weeks. In view of the increase in housing prices, after the reform of long-term care insurance, the law and the Grand-Ducal Regulation relating to gerontological care should be reviewed.

A complete overhaul of the amended law dated 25 February 1979 on housing assistance will be carried out while at the same time introducing a precise legal framework for low-cost housing. The objective is to reform the housing aid system as a whole, in particular with regard to amounts and ceilings by extending the benefit of aid to be supplied to a greater number of applicants, in particular single parents and families with children. In order to combat the "working poor" phenomenon and to appropriately implement social transfers, the amount, range and criteria for allocating the cost-of-living benefit will be accordingly modified.

Key measures completed or under way to achieve the national objective

The government continued to take measures to modernise family policy by promoting employment, including employment of women, and job retention, with a view to obtaining financial independence for both parents. In addition, the government has maintained a strong commitment to the most vulnerable people through a combination of measures to support them.

- Reconciliation of work and family life: Making parental leave periods flexible and improving the way it is granted, as well as a substantial increase in the parental leave allowance, was introduced by the reform on 1 December 2016, and since have been very successful. Prior to this reform, the educational and maternity allowances were revoked in order to promote employment, in particular female employment, and job retention. These measures support the financial independence of both parents and act to prevent the risk of poverty. The positive effects that were hoped for both in terms of reconciliation of work and family life, equal opportunities and time that parents and especially fathers have available for raising their children, have been achieved. The table below (Appendix 1) illustrates in more detail the how parental leave has evolved since its introduction in 1999 and makes it clear that the reform of parental leave is particularly favourable for men. In the past, most parental leave was taken by women. In 2018, there was almost gender parity in absolute terms with 4,875 women on parental leave, compared to 4,721 men. The trend in which fathers benefit from the mechanism in the same way as mothers was confirmed for 2019. In fact, 5,443 men took parental leave in 2019, compared with 4,944 women, which shows that men want to

participate more actively in the education of their child and that couples are increasingly sharing family responsibilities (see table in Appendix 1 - *Comparison between the 1st and 2nd parental leave - situation on December 31 of each year*).

Table 12: Comparison between the 1st and 2nd parental leave, situation at 31 December of each year, in absolute figures

	Women 1st leave	Men 1st leave	Women 2nd leave	Men 2nd leave
1999	1,323	60	20	30
2000	1,707	79	69	156
2001	1,886	75	96	240
2002	1,951	104	122	394
2003	2,143	91	158	521
2004	2,155	107	170	541
2005	2,325	96	186	611
2006	2,389	105	199	644
2007	2,285	111	181	591
2008	2,526	124	248	697
2009	2,681	106	241	788
2010	2,921	110	231	866
2011	2,711	119	242	849
2012	2,879	116	204	826
2013	2,859	141	169	908
2014	3,006	122	200	928
2015	3,268	149	221	957
2016	3,320	187	237	976
2017	4,058	327	519	3,347
2018	4,287	402	588	4,319
2019	4,364	456	580	4,987

Source: Ministry of Family Affairs, Integration and the Greater Region

- There were 58,297 authorized slots in socio-educational care structures for children 0-12 years old at 31 December 2018. Luxembourg therefore widely exceeded its national objective of 35,000 places in 2015. In Luxembourg, the education and childcare structures that are recognised as providers for child-care service vouchers use a quality assurance system. The State contributes to the costs of childcare through the service voucher system. This gives parents reduced rates or even free hours of childcare in facilities, depending on their income. The service voucher system contributes to providing greater equality opportunities, as it facilitates access for all children to quality care, regardless of their host facility. Eligible children from 1 to 4 years old have been getting 20 hours of free supervision per week since the entry into force of the multi-lingual education programme. The aim of this programme is to develop the multilingual resources for children aged 1 to 4 in a fun way. In order to further diversify the programmes in the non-formal childhood education sector, a new care centre model has been introduced, known as *mini-crèches*.

Table 13: Quantitative development of the non-formal childhood education sector

Situation at 31/12/2019	2009	2015	2016	2017	2018	2019	2017-2018 2018-2019	2018-2018 increase
Educational and childcare services authorised by social security*	20,308	37,440	38,287	40,489	42,417	41,241	-1,176	-2.77 %
Commercial educational and childcare services**	2,734	10,406	11,576	12,874	14,046	14,505	459	3.27 %
Nanny services	1,606	3,278	3,247	3,000	2,797	2,551	-246	-8.80 %
TOTAL	24,648	51,124	53,110	56,363	59,260	58,297	-963	-1.63 %

Source: Ministry of Education, Children and Youth / Education and Hosting Service Remarks: including reception centres, day care centres and nurseries ** including day care centres and nurseries

- REVIS Social Inclusion Income:** In the area of the fight against poverty and social exclusion, the law dated 28 July 2018 relating to Social Inclusion Income (REVIS) took effect on 1 January 2019. The establishment of a coherent system of policies for stabilisation, activation and professional reintegration has resulted in a division of powers between the Employment Development Agency (ADEM), the National Office for Social Inclusion (ONIS) and the National Solidarity Fund (FNS). Based on ADEM profiling, beneficiaries are either monitored by ADEM if they are deemed able to enter the job market or referred to ONIS if they have specific requirements in terms of stabilisation, social and professional activation. Accordingly, among beneficiaries of working age (between 18 and 64), 29% are considered suitable for entering the job market and are registered as job seekers with ADEM (3,412 people), 42% are undergoing intensive monitoring with ONIS (5,045 people) and 29% have no particular monitoring, due to the fact that they are either full-time employees, are on a pension, or deemed unsuitable for any type of activation for medical reasons (3,452 people). Beneficiaries under supervision of the ONIS benefit from individual follow-up by regional agents in social offices. Some 38% of them are directed towards “collective utility work” measures, which have been increasing since the law was implemented, standing at 1,393 in December 2019, compared to 1,257 equivalent measures in December 2018. The REVIS benefit is intended to strengthen the activation of all beneficiaries within a household, so that in 38 households two adults participate in such measures at the same time. A total of 47% of beneficiaries are exempt from the above measures, but are oriented towards stabilisation or preparation measures, in particular in the areas of training. An evaluation of the system focusing on the achievement of the objectives of the law and the functioning of the services is planned after a period of three years.
- Adaptation of the minimum wage, the REVIS and the RPGH schemes:** As of 1 January 2019, the minimum wage (SSM), social inclusion income (REVIS) and income for severely disabled people (RPGH) increased by +0.9 %. This increase transposes part of the decision adopted by the government in the 2018-2023 coalition agreement concerning the increase in the minimum

social wage by €100 from January 1, 2019. This increase is in addition to the 1.1% increase made by the law dated 21 December 2018.

- Cost-of-living benefit: the government council regulation dated 8 November 2019 relating to the granting of a cost-of-living benefit for 2020 aims to continue the allocation of a cost-of-living benefit to low-income households in 2020. Since 2018, family allowances, the back to school allowance and the birth allowance are no longer taken into account in determining the overall annual incomes of households, in order to increase the number of potential beneficiaries of the cost-of-living benefit and to reach more low-income families (working poor).
- The social welfare aid law: in 2019, the 30 social welfare office provided a total of €4.2 million in non-refundable financial assistance. Funding for this measure included an annual budget of approximately €20 million (50% of which furnished by the State and 50% by the municipalities).
- Homelessness and housing exclusion: The government continued to coordinate the implementation of its 2013-2020 national strategy against homelessness and housing exclusion, a final external evaluation of which is scheduled for 2020/2021 to determine which measures to pursue. The strategy is based on the principle of "Housing First", a model that Luxembourg continues to develop. Luxembourg advocates the European Typology of Homelessness and Housing Exclusion (ETHOS) and therefore refers to the problem of homelessness in its broadest sense, by covering all housing situations that may be considered inadequate. In general, the offer of accommodation facilities for adults has evolved significantly in recent years. The number of people who can be accommodated with structures (financially) supported by the Ministry of Family Affairs, Integration and the Greater Region almost quadrupled between 2013 and 2019. This increase is due to the implementation of new projects and the increase in capacities of existing structures. In 2019, the new building for the Winter Action ("*Action Hiver*"), a humanitarian action set up by the government in 2001 with the aim of preventing homeless people from becoming victims of hypothermia during periods of extreme cold, has opened, with higher accommodation capacity. Interdepartmental collaboration to combat housing exclusion among young people and support for future innovative projects were continued, such as the analysis of an ambulatory psychiatric follow-up offer for homeless people with mental disorders and planning a care home for ageing homeless people.
- Rent subsidies: The law reforming rent subsidies took effect on 1 January 2018. Its purpose is to increase the number of households that can potentially benefit from grants.
- Fund for European aid to the most deprived (FEAD): In Luxembourg, FEAD enables to respond to situations involving a lack of food or basic material goods. A total of 13,016 people representing 5192 households received food aid and basic material assistance.
- Integration: The government adopted the PAN integration scheme in 2018. The action plan provides a general, strategic and sustainable framework that is open ended, revisable and adaptable over the years. It is based on two action areas: the reception and social support of applicants for international protection as well as the integration of all non-Luxembourg persons residing in the country and addresses the three cross-functional areas of access to information and interaction, quality of services and national and international cooperation and coordination. The action plan will be implemented by all institutional and associative stakeholders through calls for projects, pilot projects and through the development and optimisation of existing integration programmes, including the Welcome and integration contract (CAI) and the Guided integration trail (PIA) schemes. To strengthen interventions in the field of integration and promote inter-ministerial collaboration, in January 2020 the government created a specific Department for Integration within the Ministry of Family Affairs, Integration and the Greater Region.

5. Use of Structural Funds

It is important to note that this chapter was developed largely before the spread of COVID-19 in Europe. Certain measures could be modified following actions taken to deal with the spread of this pandemic.

5.1 Coordination with structural funds

Coordination between the NRP and the Structural Funds is required because the Europe 2020 strategy also has a Community action program. Projects developed and supported by Community financing under structural funds heading are asked to contribute to meeting the objectives of the Europe 2020 strategy.

The European Social Fund (ESF) programme aims to combat unemployment, including youth unemployment, by strengthening the skills and competences of young people and job seekers, especially those with an immigrant background, and by seeking a better match between supply and demand in the labour market. It improves equal access to lifelong learning for all age groups, helping to keep older workers in the labour market longer. The "Investment for growth and jobs" programme has an overall budget of €40 million, including €20 million of ESF funds.

With regard to the ERDF 2007-2013 Regional Competitiveness and Employment programme (RCE), efforts to support European objectives and national objectives determined by Luxembourg have been made, particularly from the Priority 1-Objective 1 and Priority 2-Objective 3 standpoints. The RCE ERDF programme represents total public eligible commitments and investments of €85 million, of which €21.8 million in Community funds amassed during the programming period of 2007-2013 concerning Luxembourg NRP priorities and the Europe 2020 Strategy. These investments, in line with NRP objectives, correspond to 83.2% of the ERDF RCE envelope for Luxembourg for the programming period of 2007-2013. In this way, 50 projects were co-financed in the area of research and innovation by ERDF in the amount of €15.3 million and 13 projects in the area of renewable energy in the amount of €6.4 million.

The European territorial cooperation programmes (known as INTERREG) for the period 2014-2020 are currently being implemented. The three INTERREG programmes that concern Luxembourg contribute with their thematic axes to the objectives of the Europe 2020 strategy.

- The cross-border programme *INTERREG Greater Region*, with an ERDF budget of around €140 million, focuses on four themes: Pursuing the development of an integrated labour market by supporting education, training and facilitating physical mobility; ensuring an environmentally friendly development and quality of life; improving living conditions; and strengthening the competitiveness and attractiveness of the Greater Region.
- The transnational programme *INTERREG North-West Europe*, with an ERDF budget of around €396 million, are as follows: innovation; a low carbon economy; as well as resource and materials efficiency.
- The interregional programme *INTERREG Europe*, with an ERDF budget of around €359 million, focuses on the following themes: Strengthening research, technological development and innovation; strengthening the competitiveness of SMEs; supporting the transition to a low carbon economy in all sectors; protecting the environment and promoting the efficient use of resources.

5.2 Financing priorities for the period 2014-2020

Table 14: Financial contracts by area

	Total cost (in € Mn)	ERDF contribution (in € Mn)
Area 1 "Improving research, technological development and innovation"	24.2	9.7
Area 2 "Supporting the transition to a low carbon emissions economy in all sectors"	20.8	8.3
Technical assistance	2.3	1.2
Total	47.4	19.2

Source: Ministry of the Economy

For the Common Strategic Framework 2014-2020, the ERDF Managing Authority has decided to focus its action on two priority areas in accordance with the recommendations of the European Commission, which take up thematic objectives No. 1 "Strengthening research, development and technology and innovation" and No. 4 "Supporting the transition to a low-carbon economy in all sectors". In addition, it was agreed to use an Integrated Territorial Investment (ITI) supported by the themes in the two areas in compliance with regulations and sustainable urban development concepts. The areas of intervention recommended by Luxembourg are consistent with those of the European Commission and will ensure continuity with the current programming period, which is already in line with the Europe 2020 strategy. The "Investment for Growth and Jobs" Operational Programme for 2014-2020 was adopted by the European Commission on 15 December 2014.

The thematic priorities of the European territorial cooperation programmes (known as INTERREG) for the period 2014-2020 have been determined based on the Europe 2020 strategy. Cross-border, transnational and interregional cooperation projects with Luxembourgish participation, which have been approved in the programmes of INTERREG Greater Region, North-West Europe and Europe, mainly fall within two fields:

- 21 projects in the field of innovation and research with financial support of around €11 million (ERDF contribution + national co-financing) for Luxembourgish beneficiaries.
- 31 projects in the field of climate change and energy with financial support of around €34 million (ERDF contribution + national co-financing) for Luxembourgish beneficiaries.

5.3 Investment Guidance on the Just Transition Fund 2021-2027 for Luxembourg

Considering the preliminary opinion of the European Commission within the framework of the 2020 Country Report for Luxembourg regarding investment guidance on the Just Transition Fund 2021-2027, as well as the expectations linked to the territorial impact of the Just Transition Fund planned in the next multi-annual financial framework for the period 2021-2027 in Luxembourg, the government is rather of the opinion that it would be useful not to limit these investments solely to the cement and steel industries. Such an approach will not only help the regions most affected by the economic and social impacts resulting from the transition, but also support the regions at the forefront of the energy transition through the massive development of renewable energies and their integration into the energy network.

With regard to the key actions of the Just Transition Fund, the government proposes to take into consideration the measures set out in the National energy and climate plan for Luxembourg (NECP) for the period 2021-2030 and emphasising the idea of promoting Luxembourg as a country of climate solutions, in particular targeting the following activities proposed by the Commission in Annex D of the 2020 Country Report for Luxembourg:

- Productive investments in SMEs, including start-ups, leading to economic diversification and reconversion;
- Investments in research and innovation activities and fostering the transfer of advanced technologies;
- Investments in the deployment of technologies and infrastructures for affordable clean energy, in greenhouse gas emission reduction, energy efficiency and renewable energy.

In addition, in connection with productive investments in SMEs, the government also proposes to take into account investments in the creation of new firms, including through business incubators and consulting services.

Considering the needs for environmental reconversion and rehabilitation as well as regeneration of the environment, the government also proposes to target investments in regeneration and decontamination of sites, land restoration and repurposing projects. Above all, investments in the regeneration and decontamination of brownfield sites in the Southern mining basin will also foster the pursuit of high-quality eco-urbanism to counter social, economic and environmental challenges and to boost the whole of the Southern region as the second largest development hub in the country.

Considering the needs in terms of economic diversification and in accordance with the 2018-2023 government programme, the government also proposes to target investments in enhancing the circular economy, including through waste prevention, reduction, resource efficiency, reuse, repair and recycling.

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 NRP and SGP to Parliament before submission to the European Commission at the end of April.
- The social partners have been involved in the national social dialogue under the auspices of the Economic and Social Council (ESC). In autumn 2019, discussions focused on the new country-specific recommendations for Luxembourg, which were adopted in 2019 by the Council. In March 2020, a second meeting was planned. It was cancelled in the wake of the spread of the Covid-19 pandemic.

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.

Progress achieved as part of the implementation of the Luxembourg 2020 strategy should have effective follow-up, reporting and evaluation processes. Diverse structural indicators used prepare a quantitative follow-up of the Lisbon strategy had a tendency of not taking adequate account of the national specificities surrounding Luxembourg. In 2003, the Tripartite Coordination Committee decided that it would be opportune to publish a national "Competitiveness scoreboard" on an annual basis. The Observatory of competitiveness has since updated this national scoreboard up until 2016. After more than ten years of use, a revision proved necessary. A revision was therefore undertaken with social partners in the Economic and Social Council (ESC)¹¹⁸, which in July 2016 unanimously adopted its opinion on the national system of indicators that constitute the new modernised and structured dashboard. The results of this new national indicator system were presented for the first time as part of the latest Competitiveness report¹¹⁹ in the fall of 2017. This new dashboard is based on 67 indicators, including 41 entirely new ones, which are grouped into the three categories of the economy, social action and the environment. In the latest edition published in the autumn of 2019, Luxembourg ranked eighth and belonged to the group of high performing EU countries. It ranked 11th in the economy subcategory, 3rd in the social subcategory and 12th in the environment subcategory¹²⁰.

¹¹⁸ ESC, Le système d'indicateurs national, Avis, 8 July 2016

For more details see: <http://www.ces.public.lu/content/dam/ces/fr/actualites/2016/07/2016-indicateurs.pdf>

¹¹⁹ Ministry of the Economy, Le système d'indicateurs national, in the 2017 Competitiveness Report, Perspectives de politique économique n°33, Luxembourg, October 2017.

¹²⁰ For more details see: <https://gouvernement.lu/dam-assets/documents/actualites/2019/11-novembre/20-bilan-competitivite/Bilan-Competitivite-2019.pdf>



For more information, please contact:

Ministry of the Economy
19-21 Boulevard Royal
L-2449 Luxembourg

observatoire@eco.etat.lu
<http://odc.gouvernement.lu>

Luxembourg, April 2020