



LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG

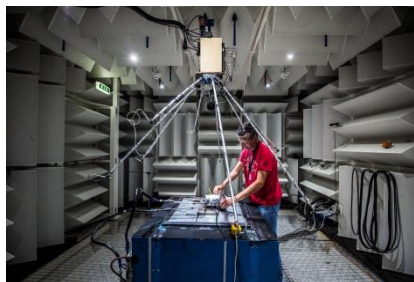
National plan for smart, sustainable and inclusive growth

Luxembourg 2020

Luxembourg, 29 April 2016

*Courtesy translation
of the official French version*

National Reform Programme
of the Grand Duchy of Luxembourg under the European semester
2016



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ACRONYMS

AAQE	Annual Allocations of Emissions Quotas
ADEM	Employment Development Agency
AIP	Professional Insertion Activities
ALJ	Local Youth Action
BNL	National Library of Luxembourg
BTS	Vocational Training Certificate
CES	Economic and Social Council
CFE	Financial Contributions by the State
CRP	Public Research Centre
CTIE	Centre for Information Technologies of the State
DIRD	Gross domestic expenditure on R & D
DSGE	Dynamic Stochastic General Equilibrium
EER / ERA	European Research Area
EFT	Labour Force Survey
ETS	Emission Trading Scheme
FEAD	Fund for European aid to the most deprived
FEDER	European Regional Development Fund
FNR	National Research Fund
ESF	European Social Fund
GES	GHG – Greenhouse Gases
IGSS	Inspectorate General for Social Security Administration
IBBL	Integrated BioBank of Luxembourg
ILR	Luxembourg Regulatory Institution
INAP	National Institute of Public Administration
KTOE	Kilo-tonne oil equivalent
LCSB	Luxembourg Centre for Systems Biomedicine
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
MODU	Sustainable Mobility Strategy
NEET	Not in Education, Employment or Training
OA	Open access
OECD	Organisation of Economic Cooperation and Development
PDM	Macroeconomic Imbalance Procedure
GDP	Gross Domestic Product
SME	Small and Medium-sized Companies
NRP	National Reform Programme
PPP	Public-Private Partnership
SGP	Stability and Growth Program
R&D	Research and Development
RDI	Research-Development-Innovation
RMG	Guaranteed Minimum Income
ETS	Emissions Trading Scheme
SNJ	National Youth Service
SSM	Minimum wage
STATEC	Luxembourg National Institute for Statistics and Economic studies
ICT	Information and Communications Technologies
EU	European Union
UEL	Union des entreprises luxembourgeoises (Employer's Organisation)

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1. Introduction

The EU economy is improving slightly. The rate of economic activity should increase progressively. Unemployment is receding, although it remains at a historically high level. The recovery is benefitting from positive factors of a temporary nature, such as low oil prices, a relatively weak euro and accommodative monetary policies. It also reflects the initial impact of reforms implemented in recent years. At the same time, considerations in the areas of security and geopolitical tension have intensified and the world economic outlook is becoming more complex, especially for emerging economies. As the positive impact of factors favourable to growth are in the process of disappearing and new challenges rise up, Member States must attempt to consolidate the recovery and take advantage of the current fair sailing to effectively implement ambitious reforms and to carry out responsible budgetary policies for the long term. Consolidating a sustainable recovery and resurrecting the convergence process is only possible if all the institutions and Member States in the EU act in concert. The priorities of the 2015 annual growth survey are still current in 2016, but efforts to underpin a sustainable recovery, free up investment and increase productivity must be pursued, all the while implementing responsible fiscal policies. These priorities are in line with the road map detailed in mid-2015 by the five presidents for deepening the Economic and Monetary Union (EMU), and they will contribute to setting the current recovery on more solid footing and to promoting growth and jobs.

In Luxembourg, a good number of economic indicators have shown positive signs at the end of 2015 and early 2016, both regarding economic activity and employment. At the end of 2015, the European Commission analyzed the Member States of the EU using the alert mechanism for the macroeconomic imbalances procedure (MIP), to determine whether they are susceptible to external or internal macroeconomic imbalances. The Commission deemed that at this stage, Luxembourg is not subject to imbalances and its analysis indicates that *“overall, the economic reading highlights a gradually improving economic environment with reduced risks.”* Many indicators present a decisively optimistic reading of the economic situation of Luxembourg in the short and medium term. Nevertheless, potential growth slackened and the country’s productivity has grown only slightly. Luxembourg is also facing a certain number of challenges, including the long-term sustainability of its public finances, climate change and its economic diversification. The government feels therefore that the way forward is to support the economic recovery by taking advantage of economic factors that are still favourable, while continuing to put forth responsible fiscal policies, increasing investment and implementing structural reforms to enhance the growth potential.

The National Reform Programme (NRP) for Luxembourg deals with these factors and challenges from a long and medium term perspective. This new 2016 edition of the NRP both reviews the implementation status of measures announced previously and addresses the 2015-2016 Council recommendations with regard to Luxembourg. In addition, it takes on Luxembourg’s national objectives for 2020, the priorities of the annual growth survey for 2016 and the country specific recommendations relating to the Euro zone. It also addresses Luxembourg’s 2016 country report that has been published by the Commission at the end of February¹.

On the macroeconomic level, Luxembourg is not among those Member States in 2015-2016 subject to an in-depth review under the Alert mechanism report (AMR). Notwithstanding, the government continues to closely monitor the country's macroeconomic performance.

¹ For more details see: http://ec.europa.eu/europe2020/pdf/csr2016/cr2016_luxembourg_fr.pdf

From the perspective of microeconomics and employment, the structural pillars for the long term are still education and training, R&D and innovation, efficient use of resources, cohesion and social inclusion², and gender equality as a cross-disciplinary objective. In 2015, the government launched a study on the “Third industrial revolution in Luxembourg”³. The objective of this study is to prepare Luxembourg for a permanently changing environment via a long-term economic vision. Luxembourg already has available solid foundations for facing challenges of the future. Major actions have been taken over the last decade in the areas of ICT, logistics and energy⁴. Now these technologies must converge within a smart grid as a determining factor of productivity, which will ensure more effective use of resources.

At the end of February 2016, the government introduced the elements of the tax reform announced as part of its NRP⁵, slated for implementation in 2017. The key words for this reform are sustainability, fairness, selectivity and competitiveness. This tax reform indicates a balance between tax breaks for households and companies and sustainability of public finances. On the fiscal level, the NRP goes hand in hand with healthy and viable public finances as formulated in Luxembourg’s Draft Budgetary Plan (DBP)⁶ and Stability Programme (SGP)⁷.

With a view to increasing transparency and encouraging ownership on the national level, the government again involved the Parliament and social partners in the European semester programme for 2016:

- Parliament was involved during the European semester week that took place at the end of April focusing on the government’s statement concerning the economic, social and financial situation of the country.
- Social partners were again involved as part of the national social dialogue that took place under the aegis of the Economic and Social Council (ESC). This involves an annual cycle of regular consultations, which started in 2014 and seeks to cultivate regular social dialogue throughout the year so that the social partners can submit their viewpoints to the government⁸.

To sum up, a coordinated package of measures included in the NRP underpinned by a responsible fiscal policy, and supplemented by a stronger governance effort, should allow the country to consolidate a basis for a smart, sustainable and inclusive growth in the long term.

² On the social level, this NRP is also consistent with the National Social Report (NSR)

³ For more details see: <http://www.troisiemerevolutionindustrielle.lu/>

⁴ MINISTRY OF THE ECONOMY, The economic impact of the five new priority sectors, 2015 Competitiveness Report, Luxembourg, *Perspectives de politique économique n°30*, October 2015.

For more details see: <http://www.gouvernement.lu/5643170/ppe-030-fr.pdf#page=161>

⁵ For more details see: <http://www.gouvernement.lu/5765249/29-reforme-fiscale?context=3422869>

⁶ Draft Budgetary Plan for Luxembourg 2015-2016 <http://www.budget.public.lu/lu/budget2016/>

⁷ For more details see: <http://www.mf.public.lu/publications/index.html>

⁸ For more details see: <http://www.ces.public.lu/fr/semestre-europeen-2016/index.html>

2. The macro-economic scenario for 2016-2020

2.1 Macro-economic perspectives for the period covered by the program

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

According to medium-term macroeconomic forecasts by the SGP 2016-2020, Luxembourg will likely post real GDP growth in volume of 2.9% in 2016 and of 4.5% in 2017, with medium-term growth around 3.4% on average for the 2018-2020 period. Potential growth is estimated at nearly 3%.

For the long term, the government is aligning its main economic assumptions on the macroeconomic scenario used for Luxembourg in the study by the *Working Group on Ageing Populations and Sustainability* by the Economic Policy Committee and on its most recent report on ageing⁹.

2.2 The macro-economic 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 that will better simulate macro and micro-economic impacts of structural reforms. Some characteristics of the model make it particularly well adapted to analyzing economic policies implemented by Luxembourg. It integrates the economic specificities of Luxembourg, especially the particular functioning of the labour market that assimilates residents and cross-border workers, the importance of negotiations between unions and companies, and the fact that Luxembourg is a small, 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 major level of Luxembourg's specialization in its financial *cluster*. The development of a new version, known as LSM2, addresses this concern. The LSM2 model including the banking sector for Luxembourg was introduced in June 2012. However, it should not be forgotten that there is no ideal structure for an institutional macro-econometric model¹⁰.

⁹ For more details see: http://europa.eu/epc/working_groups/ageing_en.htm

¹⁰ For more details see: <http://www.gouvernement.lu/4105035/modele-structurel-luxembourgeois-lsm>

3. Implementation of country specific recommendations

In July 2015 the Council adopted three recommendations for Luxembourg for the period 2015-2016. This chapter describes the measures implemented in Luxembourg to address these recommendations.

3.1 Tax base

“Broaden the tax base, in particular on consumption, recurrent property taxation and environmental taxation.”

The government instituted an increase in the VAT rate that went into effect in January 2015. In general, the standard and reduced rates of VAT rose by two percentage points, from 15% to 17%, from 12% to 14% and from 6% to 8% respectively. With the intent of broadening the tax base, the government also extended the new standard VAT rate of 17% to alcoholic beverages served in restaurants and bars and to real estate investments, excluding the main residence, in place of the super-reduced rate of 3%. With relation particularly to taxes on energy products in transportation¹¹, the government also increased taxation of fuels used in transportation by increasing the VAT rate from 15% to 17%.

Lastly, over the past few years the government has been engaged in preparatory work to implement a tax reform. To this end, in February 2015 the government assigned the Economic and Social Council (ESC) the task of consulting existing data in the area of direct and indirect taxation, focusing on both physical persons and companies, as well as on their budgetary impacts. At the end of November 2015, the ESC submitted its opinion on the analysis of tax data in Luxembourg¹². At the end of February 2016 the government introduced the elements of the tax reform¹³, which is to take effect in 2017.

3.2 Statutory and effective retirement age

"Close the gap between the statutory and effective retirement age, by limiting early retirement and by linking statutory retirement age to life expectancy."

The government has taken a series of measures to reduce the gap between statutory and effective retirement ages.

Following the implementation of a pension reform on 1 January 2013, whose particular object was to align the replacement rate with life expectancy and to provide regulatory mechanisms for persons with insufficient financial resources, the government will now proceed with an initial evaluation of the impact of the reform in 2016. The government will set up a Pensions Group, whose task will be to check the links of newly introduced provisions, especially those of the readjustment mechanism, within the legislative period and based on actuarial opinions established by the Inspectorate General for Social Security Administration (IGSS).

Likewise, in an effort to extend the working lives of contributors, the government instituted a reform of the professional classification scheme for persons with partial incapacity for work. The

¹¹ This measure does not apply to electricity or LPG, on which tax rose from 6 to 8%.

¹² For more details see: <http://www.ces.public.lu/fr/actualites/2015/11/fiscalite/index.html>

¹³ For more details see: www.reforme-fiscale.public.lu

central objective of this reform is to keep reclassified persons at work, especially older persons¹⁴, while providing adequate protection for those who are most vulnerable. The modifications of the law dated 23 July 2015 that changes provisions in the area of professional reclassification, which have been in effect since 2016, aim at accelerating procedures, a more thorough preservation of individual rights in external reclassification and the creation of conditions conducive to favouring internal reclassification. The concept is 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. The reform seeks to prioritize internal reclassification by introducing an obligation of management to internally reclassify persons in all companies employing at least 25 persons. Regarding external classification, the law introduces new methods, such as a protective status for employees reclassified externally and it will henceforth be possible to assign externally reclassified job seekers to public service works. In the same way, the reclassification procedure is facilitated and accelerated and there will be a periodic reevaluation of reclassified employees. Furthermore, the new system will reduce long-term unemployment, which features numerous long-term job seekers that were reclassified externally, and it will make the reclassification system more effective and efficient.

The role of the Social Security administration's medical check-up was reformed by the law dated 7 August 2015, providing the administration with the tasks and adequate human resources for undertaking more stringent checks, authorizations of workers and evaluations of persons with work incapacities in upcoming years.

In August 2015, the government submitted a draft law on modifications to the solidarity, progressive and early retirement systems of shift and night workers, excluding adjustments. This reform focuses more on employees with difficult jobs and therefore takes more into account the working conditions of employees, while favouring the retention of older workers in companies. More precisely, the draft law will abolish the early retirement-solidarity system and the adaptation of other early retirement systems, except for the adjustment scheme, which is meant to prevent older workers from losing their job because of economic reasons and then joining the unemployment rolls with few prospects of professional reinsertion.

As management of the age pyramid within a company is a key factor in keeping older workers on the job, the government has taken the initiative to establish a legislative mechanism in the area that preserves a broad margin of manoeuvre for the social partners to take sector-specific issues into account and to even adapt approaches that assimilate specific problems of individual companies. The draft law that introduces a package of measures in the area of age policy, which is currently in the legislative procedure, will require employers with more than 150 employees to draw up an age management plan bearing on at least three of the following points: recruitment of older workers, anticipation of changes in professional careers, improvement of working conditions, access to continuing education and training and transmission of skills and knowledge. Financial initiatives are being included for the companies in this group, as well as for those companies not required to draw up plans but who voluntarily apply an age management plan. With the age pyramid management effort for the civil service in mind, in its continuing education programme, the National Institute of Public Administration (INAP) has included alongside training that aims at developing skills throughout employees' careers, training that more specifically targets older civil servants and that deals with aspects such as overall preventive health management, well-being on the job and strategies for maintaining proper work-private life balances. Recent civil service reforms that are

¹⁴ 50.1% of the persons reclassified externally are over 50.

now in effect also provide for actions to maintain older workers on the job. These include introducing management by objectives and regular individual interviews that are intended to ensure that civil servants' professional skills remain updated, the introduction of progressive retirement scenarios, with part-time work and partial pensions combined, the introduction of a part time therapeutic leave and the development of a programme for well-being at work.

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 learning¹⁵. 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.

3.3 Wage setting system

“Reform the wage-setting system, in consultation with the social partners and in accordance with national practices, with a view to ensuring that wages evolve in line with productivity, in particular at sectoral level.”

In December, 2011 the government decided to modulate the automatic wage indexation mechanism. The law concerning this modulation was approved at the end of January 2012¹⁶. A maximum of one automatic indexation payment per year was permitted in 2012, 2013 and 2014. In addition, an interval of 12 months had to elapse between each automatic indexation. The automatic indexation that was to have been paid in early 2012 was put back to October 2012 and the indexation that was to have been triggered in February 2013 was put back until October 2013. As a result, 2014 was the last year covered by the 2012 law and a subsequent adjustment to wages, salaries and pensions could then have occurred on 1 October 2014 at the earliest. However, with slowing inflation, no adjustment has been triggered since October 2013.

In its programme at end 2013, the government stipulated that the automatic wage indexing system would remain intact. However, should it be confirmed that Luxembourg has not fully emerged from the crisis, the government will, following consultation with the social partners, adapt legislation in the area of automatic wage indexing based on the temporary model in effect during the 2012-2014 period. Based on modest inflation forecasts, the government decided to re-introduce the "non-modulated" automatic wage indexing mechanism as provided for by the amended law dated 22 June 1963 for the period subsequent to that indicated by the temporary provisions of the 31 January 2012 law. Nonetheless, the government stated that in the event of increased inflation in an economically difficult climate, the wage indexing system would return to the modulated version. In principle, an average of twelve months must elapse between two adjustments of wages and salaries to consumer price indices during the period between July 2014 and July 2018. If it is observed that this time period principle has a strong chance of being disregarded, consultations will occur regarding steps to take to remedy this situation. Should disagreement arise regarding what measures to implement, the government will submit the question to the legislative process so as to adopt the necessary measures, in accordance with the government programme.

Because of the widespread disinflationary environment over recent years, crowned by low prices for oil, upward tension on wage costs remain very limited in Luxembourg. This trend should last over

¹⁵ For more information:

<http://www.men.public.lu/catalogue-publications/adultes/informations-generales-offre-cours/livre-blanc-lifelong-learning/131025-s31-livreblanc.pdf>

¹⁶ Law dated 31 January 2012 adapting certain forms of applying the sliding wage scale and modifying Article 11 of the amended law dated 22 June 1963 setting the scheme for State functionary salaries.

the short term. The most recent inflation forecasts¹⁷ by STATEC in February 2016 were revised downward compared to the November 2015 forecasts, with a 0.2% increase in 2016 and a 1.6% rise in 2017. According to these forecasts and contingent upon the assumptions concerning changes in the price of oil, the next automatic adjustment to wages and salaries would occur between the 4th quarter of 2016 and the 2nd quarter of 2017. This would mean that no automatic wage indexing would have occurred in Luxembourg for around three years, i.e. since October 2013.

The government is closely monitoring changes in wage and price setting behaviour. A number of studies have been launched to assimilate these issues:

- a legal study on the methods of regulating automatic price indexing clauses¹⁸ was published in 2012.
- a study on price adjustments of companies in Luxembourg¹⁹ was published in 2013.
- a macro-economic study on wage setting with and without an automatic indexing system was published in 2014²⁰. The comparative study shows that the presence of institutionalized indexation does not significantly modify the setting of hourly wages, as observed in long-term relationships and dynamic reactions to exogenous shocks.
- a new research project was launched by the government in June 2015 with the University of Luxembourg concentrating on an analysis of the impact of sector interactions on changes in wages. Results are expected in the first half of 2016.

To conclude, as part of the analysis of changes in unit labour costs (ULC), the government has tasked the Economic and Social Council (ESC) with an “Analysis of productivity, its determining factors and outcomes in an international environment.” This productivity analysis is proving to be a particularly complex exercise for a small, open economy such as that of Luxembourg, which is essentially geared toward services.

¹⁷ According to the national consumer price index (IPCN). For more details see:

<http://www.statistiques.public.lu/fr/actualites/economie-finances/prix/2016/02/20160217bis/20160217bis.pdf>

¹⁸ MINISTÈRE DE L'ÉCONOMIE ET DU COMMERCE EXTÉRIEUR, Modalités de la réglementation des clauses d'indexation de prix en France, Allemagne, Belgique et au Luxembourg, Perspectives de politique économique n°19, Luxembourg, May 2012.

For more details see: <http://www.odc.public.lu/>

¹⁹ MINISTÈRE DE L'ÉCONOMIE ET DU COMMERCE EXTÉRIEUR, Étude des adaptations de prix des entreprises au Luxembourg, Perspectives de politique économique n°26, Luxembourg, July 2013.

For more details see: <http://www.odc.public.lu/>

²⁰ MINISTÈRE DE L'ÉCONOMIE, Formation des salaires et indexation automatique: MINISTÈRE DE L'ÉCONOMIE ET DU COMMERCE EXTÉRIEUR, Étude des adaptations de prix des entreprises au Luxembourg, Perspectives de politique économique n°28, Luxembourg, July 2014.

For more details see: <http://www.odc.public.lu/>

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

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 Member State 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 these European objectives. Luxembourg is determining its national objectives for 2015-2020 and a series of measures to implement them as part of its NRP.

Table 1: National objectives determined by Luxembourg in April 2016

		Europe 2020 objectives	Luxembourg 2020 objectives
Priority 1 “Smart growth”	<i>Objective 1</i>	“ (...) raising combined public and private investment levels in this sector to 3% of GDP ”	2,3-2,6%
	<i>Objective 2</i>	“ (...) reduce school drop-out rates to less than 10%”	Sustainable under 10% (a)
		“ (...) increasing the share of 30-34 years old having completed a university degree or equivalent level of studies to at least 40%”	66% (b)
Priority 2 “Sustainable growth”	<i>Objective 3</i>	“ (...) reduce greenhouse gas emissions by 20% (...)”	Reduction of GHG outside of EU ETS -Less than 20% compared to 2005, i.e. emissions of around 8,145 Mt CO₂ in 2020 (c)
		“ (...) increase the share of renewable in final energy consumption to 20%”	11% (c) Average 2015/2016 5.45%
		“ (...) move towards a 20 % increase in our energy efficiency”	Use of final energy of 49.292 GWh i.e. 4.292 ktoe
Priority 3 “Inclusive growth”	<i>Objective 4</i>	“ (...) raise to 75 % the employment rate for women and men aged 20-64”	73% (71.5% for 2015)
	<i>Objective 5</i>	“ (...) lift at least 20 million people out of the risk of poverty and exclusion”	Reduce the number of persons under the threat of poverty or social exclusion by 6,000 by 2020 (d)

Notes:

(a) National data will also be used as measurement tools because the indicator calculated by Eurostat that came 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 provides 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 among the two populations is much less marked. Furthermore, the proportion of university degrees is higher among natives than among foreign born persons there.

(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.

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%**. At midterm in the Europe 2020 strategy, in 2015, Luxembourg had set an intermediate target of 71.5%. According to the latest available data, Luxembourg came very close to this intermediate objective with an employment rate of 70.9% in 2015. The increase in the employment rate is also due to wider participation of women in the labour market. The employment rate for women rose from 58.4% in 2005 to 65.0% in 2015.

Table 2: Statistics of the labour market in Luxembourg

	2005	2010	2013	2014	2015
Domestic employment	287.178	337.295	362.249	371.209	380.928
<i>Percent of cross-border workers</i>	41,2 %	44,4 %	44,3 %	44,4 %	44,7 %
<i>Percent of women</i>	37,9 %	39,3 %	40,4 %	40,5 %	40,5 %
Total employment rate [20-64]	69,0 %	70,7 %	71,1 %	72,1 %	70,9 % *
Employment rate: Men	79,4 %	79,2 %	78,0 %	78,4 %	76,7 % *
Employment rate: Women	58,4 %	62,0 %	63,9 %	65,5 %	65,0 % *
Employment rate: Youths [20-24]	44,0 %	35,5 %	35,4 %	33,3 %	44,1 % *
Employment rate: Youths [25-29]	81,3 %	81,5 %	76,0 %	81,0 %	80,9 % *
Employment rate: Seniors [55-59]	46,8 %	55,7 %	54,7 %	58,1 %	55,9 % *
Employment rate: Seniors [60-64]	12,7 %	20,1 %	22,9 %	23,1 %	16,5 % *
Unemployment rate	4,5 %	4,4 %	5,9 %	5,9 %	6,6 % *

Source: STATEC, Eurostat-LFS

Note: *break in series in 2015 for employment rate and unemployment rate

4.1.2 Key measures

Apart from the measures that are part of the implementation of EU Council recommendations in the area of employment²¹, the government continued its efforts to achieve the national objective in the area of employment. These efforts focus particularly on supporting job seekers who seek professional insertion, targeting vulnerable groups, especially the young, women, seniors and persons with specific needs. 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 professionalization placement programme²² and the professional reinsertion contract²³ are two new measures that have become applicable since 2016, intended for job seekers at least 45 years old, those who have been reclassified externally or those with the status of disabled worker. The first measure is a work placement with a maximum period of six weeks that gives 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.

As part of the implementation of the reform of civil service and national employment, the Employment Development Agency (ADEM), the personalized process for job seekers is a cornerstone. This new method of functioning was rolled out completely in December 2015. It seeks to optimally mobilise expertise within ADEM so as to exploit it in professional insertion actions for job seekers by qualitatively improving support provided to the jobless. The process is also useful in managing the constantly increasing number of cases and in personalizing/individualizing follow-up of job-seekers in order to get them sustainably employed as rapidly as possible.

In March 2016, JobBoard, a new interactive platform was officially launched, which seeks to increase the opportunities for job seekers²⁴ and employers to meet.

An agreement was concluded between the Union des entreprises luxembourgeoises (UEL), the government and ADEM under the "Entreprises, partenaires pour l'emploi" programme to recruit 5,000 job-seekers between 2015 and 2017. The programme calls for close cooperation in carrying out specific actions, in particular, setting up regular exchanges of information, developing partnerships between ADEM and private companies, developing targeted training for job-seekers that is adapted to company requirements and awareness campaigns. Since it was launched, actions undertaken have led to the recruitment of around 1,800 additional job-seekers in one year, an increase of 16%²⁵.

The Guarantee for Youth programme²⁶, officially launched in June 2014²⁷, has been continuously developed and improved, especially regarding the launching mechanism for NEETs, youths who are not in jobs, not in school, not in training programmes and not in an academic course.

²¹ See chapter 3.2.

²² For more information: <http://www.adem.public.lu/fr/demandeurs-demplacement/beneficier-mesures-aides/mesures-emploi/stage-professionnalisation/index.html>

²³ For more information: <http://www.adem.public.lu/fr/demandeurs-demplacement/beneficier-mesures-aides/mesures-emploi/Contrat-reinsertion-emploi/index.html>

²⁴ Presentation of the new Job Board: http://www.adem.public.lu/fr/actualites/adem/2016/03/JobBoard_presentation/index.html

²⁵ First report of the "Companies, partners in employment":

http://www.adem.public.lu/fr/actualites/adem/2016/03/JobBoard_presentation/index.html

²⁶ For more details see: <http://jugendgarantie.lu/>

²⁷ Official launch of the Guarantee for Youth programme: <http://www.gouvernement.lu/3812417/26-garantie?context=3423222>

Job-seekers from immigrant communities often do not have a good command of at least one of the languages used in Luxembourg. To assist with this, ADEM has developed its internal language training offer and developed partnerships externally to offer job-seekers more courses.

The government has set up a Civil Service Observatory, whose tasks are to set up a systematic collection of data on employment in the civil service and analyze these data, carry out research, surveys and studies on various themes, set up an international scope monitoring system concentrating on HR management, organisation of the public sector and distribution within the civil service, and vice versus.

Improved insertion of women in the labour market is a priority for the government. An entire series of measures have been taken or are in the pipeline for this:

- It is essential to emphasize promoting reconciliation between professional and family responsibilities, for example providing child care services, day nurseries, full-time schooling, etc. In this context, following discussions with the social partners, parental leave was modified to better take into account the specific requirements of men and women who work and wish to care for their children.
- A certain number of measures in the 2015-2018 Equality between Men and Women Plan of the government deal with the employment rate of women: support for networks and federation that promote women setting up businesses with financial aid on a case by case basis, support for incentive prizes promoting women business entrepreneurs, such as the *Woman Business Manager of the Year* prize, the implementation of statistics concerning the granting of establishment authorizations broken down by gender, the development of career change or insertion projects for women, especially single parents, under existing mechanisms to ensure that they do not slip into precarious situations²⁸ and better supervision of work exemptions due to pregnancy to avoid situations of exclusion harmful to women's careers. The draft law whose objective is to implement certain provisions of the Equality between Men and Women Plan²⁹ includes inscribing the general provisions relating to wage equality between the genders into the Labour Code.
- The government will adopt a firm policy in favour of balanced representation between men and women on the decision making level. It will intervene where it can to directly reduce the imbalance that still remains despite voluntary efforts that have been put forth in recent years. The law on financing political parties will be modified by the introduction of a requirement for political parties to guarantee that a quota of 40% of the under-represented gender be included on electoral lists receiving funding by the parties. Financial sanctions will be put in place for failure to comply with regulatory minimums. The government will carry out a systematic review of the situation in the area of equality on the policy decision making level. The government will guarantee promoting a balanced representation of women and men sitting on Boards of Directors of public establishments. The government intends to achieve a 40% figure in terms of representation of the under-represented gender on Boards of Directors and 40% in appointments to Boards of Directors of private companies that it has a shareholders' stake in. In 2016, the percentage of women on Boards of Directors was estimated at 23%, while this percentage was still around 20% in 2011. The percent of women presiding Boards of Directors was estimated to be 16%, while that of woman presiding Management Boards was estimated at 10%. The government will support the proposal for a directive by the European Commission

²⁸ See chapter 4.5.

²⁹ Draft law with the objective of implementing certain provisions of the Gender Equality Plan for 2015-2018 regarding 1. Modification of the Labour Code, 2. Modification of Article 2 of the amended law dated 21 December 2007 relating to regulation of the financing of political parties.

seeking to guarantee a balanced representation of women and men sitting on Boards of Directors of companies listed on the stock exchange.

- Specific incentive measures, as well as positive actions, must be bolstered both in private corporations and in public institutions. As in past years, the objective is to get a dozen companies in the private sector to participate in the positive action programme. The programme will be further expanded and a network that includes participating companies and companies interested in the programme will be implemented. Since 2011, all ministerial, administrative and services departments of the State have also been requested to participate annually in the positive action programme.

Lastly, the implementation of measures and actions that were developed to sustainably promote professional insertion, keeping people employed and social inclusion are supported by the new operational programme for 2014-2020 of the European Social Fund (ESF)³⁰.

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

Under the Europe 2020 strategy, Luxembourg committed to increasing its support of research and innovation and to make an objective of dedicating investments to between **2.3 to 2.6% of GDP in 2020**, about a third of which, between 0.7 and 0.9% of GDP, will come from public research.

Table 3: Changes in public budget allocations for RDI from 2000 to 2014

	2000	2006	2008	2010	2012	2013	2014	2015
Mn €	23,6	102,5	167,9	225,2	303,6	348,2	351,8	382,1
% GDP	0,10	0,31	0,45	0,57	0,69	0,74	0,72	0,73

Source: www.statistiques.public.lu

The government's R&D budgets have continued to increase, both in the public and private sectors, with allocations evolving from €23.6 million in 2000, representing 0.10% of GDP, to €382.1 million in 2015, 0.73% of GDP. The economic crisis of recent years has had a major negative impact on R&D expenditures in Luxembourg. An in-depth analysis indicates that the drop in private R&D expenditures appears more pronounced in the financial and insurance sectors. Expenditures in the public sector have continued to increase. For the first time, investments in infrastructure and buildings for public R&D activities since 2010 were integrated into gross internal expenditures.

Table 4: Changes in gross domestic expenditures and in intensity of research by sector

Year	Public research (In euros, mn.)	Intensity (% of GDP)	Private research (In euros, mn.)	Intensity (% of GDP)	Total (In euros, mn.)	Total (% of GDP)
2000	27,5	0,12	337,0	1,45	364,5	1,66
2005	64,0	0,21	408,0	1,38	472,0	1,59
2006	78,5	0,24	485,0	1,45	563,5	1,69
2007	96,6	0,26	495,0	1,35	591,6	1,61
2008	136,8	0,36	482,0	1,28	618,8	1,64
2009	149,6	0,42	470,7	1,30	620,3	1,72
2010	203,7	0,52	400,0	1,01	603,7	1,53

³⁰ See chapter 5.

2011	215,2	0,51	416,2	0,99	631,4	1,50
2012	251,0	0,58	310,4	0,71	561,4	1,29
2013	287,8	0,62	317,9	0,68	605,7	1,30
2014	291,1	0,59	323,0	0,66	614,2	1,25

Source: www.statistiques.public.lu

Intensity of public R&D investment is now near the national objective of 0.7% to 0.9% of GDP. It is interesting to observe that the percentage of public research in Luxembourg rose from 7.5% of all expenditures in 2000 to nearly 48% in 2014.

Table 5: Financial contribution of the State and Third-Party financing for the University of Luxembourg for 2014-2017 in €mn

2014 – 2017 Agreement	2014	2015	2016	2017	Total
CFE Université	128,7	149,0	154,2	158,9	590,8
Third party financing	32,0	35,0	38,0	40,0	145,0
Total	160,7	179,4	181,4	183,5	735,8

Source: Ministry of Higher Education and Research

Regarding financial contributions of the State (CFE) and third party financing of the University of Luxembourg and public research centres (CRP) authorised for the period 2014-2017, it was decided to establish four year authorisations accompanied with revision clauses at mid-term, prior to the end of 2015. The revision provides the opportunity to apply changes the government considers appropriate. To this end, following a mid-term revision the financial commitment of the State for 2016 and 2017, the contribution was increased by €12 million for 2016 and by €18 million for 2017.

Table 6: Financial contributions by the government and Third Party financing of public research centres authorised for the period 2014-2017 in €mn

2014 – 2017 Authorisations	2014	2015	2016	2017	Total
LIST	37,0	39,0	40,6	41,0	158,6
LIH	31,0	31,1	31,1	31,1	124,3
LISER	10,4	10,5	10,5	10,5	41,9
Total CFE for the State	78,4	80,6	80,6	80,6	324,8
Total third party financing	40,5	43,2	45,3	46,9	175,9
Total budget	118,9	123,8	125,9	127,5	500,9

Source: Ministry of Higher Education and Research

4.2.2 Key measures

a. Measures for achieving the national target in public research

The government aims at increasing the effectiveness of the national research system through various consolidation and harmonisation actions.

Since 2010, the government has been able to furnish some €800 million to complete construction and fit out for the new Belval infrastructures. The highlight of 2015 was the first major occupation of the facilities at Belval in the Maison du Savoir, the Human Sciences building and the Innovation building. At present, the Education Authority and the Administrative Departments of the University of Luxembourg, the National Research Fund (NRF), the *Institut Universitaire International du*

Luxembourg (IUIL) and the Restena Foundation occupy the same premises in the *Maison du Savoir*. The Luxembourg Institute of Science and Technology (LIST), the Robert Widong Centre and the national Luxinnovation agency are located in the House of Innovation building. The Faculty of Letters, Human Sciences, Educational Arts and Sciences, Luxembourg Income Study (LIS) and the Luxembourg Institute of Socio-Economic Research (LISER) are located in the House of Human Sciences. As of the autumn of 2015, 2,000 students and 1,600 researchers and staff have been occupying the premises of the *Cité des Sciences*. The interdisciplinary Luxembourg Centre for Systems Biomedicine (LCSB) and the national Technoport incubator have been established there since 2012. For the first time in the nation's history, nearly all of its R&D activities are located on a single site.

Recently, an ambitious plan was implemented to bolster the RDI environment by consolidating cooperation amongst the various participants in public research, especially through the grouping of certain institutions and by concentrating on several strategic areas, such as ICT, biomedicine and materials. Under the 3 December 2014 law whose purpose is to organize public research centres, LIST, which is the offshoot of the grouping of the Gabriel Lippmann and Henri Tudor public research centres and which has been operational since 2015, is intended to contribute to the socio-economic development of the country by developing technological skills and activities focusing on the three major areas of the Environment, ICT and Materials. Along the same lines, the integration of the Integrated BioBank of Luxembourg (IBBL) and the CRP-Santé Health Research Centre in the Luxembourg Institute of Health (LIH) ensure the grouping of a certain number of activities in the area of health and biomedicine.

The NRF has a strengthened role in the public research mechanism, as underscored by the law dated 27 August 2014 on the reform of the NRF, which led to the fund focusing on three strategic objectives: achieving critical mass in R&I by developing scientific leadership in the key domains, transforming public research into a competitive advantage and establishing a link between science, research and civil society. This consolidation effort was underpinned by the introduction of a new PRIDE financing programme to support doctoral work on the national level. This programme is used to finance a block of non nominative doctoral bursaries in order to support a critical mass in a specific area of excellence and to attract the best doctoral students.

The CORE programme, a multi-year financing program for priority areas, is also used to improve the quality of public research in these key areas. Under the CORE 2015 tender, the NRF selected 31 projects for financing in the amount of €17.8 million, of which ten were CORE Junior projects. As part of international bilateral cooperation programmes implemented through the CORE programme, seven bilateral projects submitted were selected for financing.

Shared recruiting of excellence universities is at the foundation of the plan implemented by the government and seeks to increase joint research, events and supervised doctoral student activities, to work more closely together. This has given rise to a memorandum of understanding between the University of Luxembourg and LISER, and eight joint professorships are planned for recruitment in 2016 and 2017.

Since 2015, the NRF has been financing the National Centre of Excellence in Research on Parkinson's disease. This programme combines the skill sets of three Luxembourg partners, LCSB, LIH and CHL in the domain of Parkinson's disease for a four-year period with a budget of €4 million and the possibility of a four-year extension with a further €4 million budget, subject to evaluation.

The government established the agreements for implementing public research activities for 2014-2017 in concert with the participants. In accordance with the Performance Contract philosophy, the research centre agrees to achieve a number of objectives specified by indicators and results in

exchange for an aid allocation from the State. The State also accords an important role to carrying out results oriented evaluations in order to ensure that public expenditure achieves its objectives. In the fall of 2015, the government ordered an external appraisal of the University of Luxembourg, with particular stress on evaluating results of various research units and two interdisciplinary centres.

Table 7: Results indicators for public research centres set for the 2014-2017 period

2014 – 2017 Authorisations	Results indicators
Number of scientific publications (having an impact factor over 2)	1,040
Number of doctoral theses completed	167
Number of patents applied for	45
Number of <i>spin-offs</i> created	10

Source: Ministry of Higher Education and Research

Table 8: Results indicators committed to and achieved by public research centres and CEPS for the 2011-2013 period

2011-2013 period	Results targeted	Results achieved
Number of scientific publications (having an impact factor over 2)	558	775
Number of doctorate candidates	132	137
Number of doctoral theses completed	91	90
Number of patents applied for	23	34
Number of spin-offs created	6	4

Source: Ministry of Higher Education and Research

A second OECD review of the RDI policy in Luxembourg was presented in April 2015. New recommendations based on an in-depth analysis of the current system were formulated and will serve as food for thought in 2016 to establish a national strategy for higher education, research and innovation, in order to best determine complementary fits between different institutions, to create synergies and to better coordinate actions on the national level.

The government is also working to generate synergies by means of cross-border initiatives and to stimulate the development and implementation of joint national, European and international projects:

- The government seeks better integration of Luxembourg players in scientific and technological cooperation programmes and initiatives at the European and wider international levels. Particular attention is paid to heightened participation in the Community Horizon 2020 programme activities. Statistics for January 2014 to November 2015 show that 101 out of 623 projects were selected, 16.21% of them, with a financial return of €30.7 million.
- At present, four beneficiaries of an *ERC consolidator grant* are working in Luxembourg and six researchers of Luxembourg nationality are carrying out research projects financed by ERC outside of the country.
- The INTER programme is used by the NRF to initiate bi- and multi-national arrangements for tenders to projects in collaboration with other national/international financing organizations. Through this, Luxembourg researchers can implement joint projects between foreign research centres and their own institutions. The 2014-2017 amount for INTER is €18 million. The Luxembourg partner must be deemed eligible by the NRF, while the foreign partner must be deemed eligible by the financing agency of the partner country. The purpose of the *INTER Mobility* programme is to promote exchanges of senior researchers between public research organizations of Luxembourg and other countries for periods of six weeks to one year. This

programme is also used to support exchange of key knowledge and technological expertise, as well as to link up research communities in the private sector with those in the public sector. In 2015, the NRF evaluated 27 mobility proposals, of which 10 were selected for a total budget of €0.9 million.

- The NRF currently participates in seven ERA-Net projects³¹, in multi-lateral projects like the EUROCORES Scheme of the European Science Foundation (ESF), European Collaborative Research Projects ERCP (ESF), Materials World Network (MWN) - NSF MATERIALS, and in the initiatives under article 185 like the joint assistance programme for autonomy at home (AAL), the partnership of European countries and development of clinical trials (EDCTP2), as well as the R&D programme undertaken jointly by several Member States that seeks to support SME working in R&D (EUROSTARS 2) activities. In 2014, Luxembourg also declared its financial commitment for the PRIMA initiative, a research and innovation partnership in the Mediterranean region over a period of ten years.³¹
- Luxembourg is participating in DARIAH, a digital infrastructure that seeks to develop and support research in all human and social sciences disciplines, and in SHARE, an infrastructure carrying out a survey on health, ageing and retirement in Europe. The stakes in EATRIS, an advanced medical translational research infrastructure, and ELIXIR, an infrastructure that supports information on biological data, are currently going through the decision process within the government. Certain players have expressed interest in participating in PRACE, for which the representative organizations are putting a pan-European infrastructure in place for high performance calculations that provide large scale access to resources and services for management and data processing.

The government is continuing its efforts to develop an environment propitious to the expansion of scientific and technological employment, seeking to promote mobility and career prospects.

- By virtue of the 3 December 2014 law on the organization of public research centres, the European Charter for Researchers and a Code of Conduct for the Recruitment of Researchers must be included in the internal regulations. The AFR financing programme complies with the principles stated in the Charter and the Code and adheres to the "Towards a European framework for scientific careers" directives. In order to ensure open, transparent and merit-based recruitment, all positions announced by public RDI institutions must be made public and all positions displayed on European / International scope *web* sites, especially the EURAXESS portal. In addition, recruiting committees for new management positions are obligatory.
- The ATTRACT and PEARL programmes of the NRF seek to attract top researchers. The ATTRACT programme targets exceptional young researchers from abroad, while the PEARL programme offers the means to public research organisations of recruiting experienced researchers in areas of strategic importance to Luxembourg. Three PEARL projects were submitted for the 2015 tender. None of the applications was selected during the evaluation process. Six candidates submitted an application to the ATTRACT programme in 2015 and one was selected for financial backing in the amount of €1.5 million.
- The University of Luxembourg is currently offering doctoral programmes in seven areas that actively participate in the implementation of the general *Doctoral Education Framework* policy for professionalizing doctoral degrees and facilitating students' entry into career paths. Furthermore, the NRF adopted the *Quality Framework for Doctoral Education* document that determines quality principles and standards for institutions hosting doctoral programmes financed by the NRF.
- The government also intends to do more to promote gender equality in research. The University of Luxembourg will be spotlighting the effort for equal opportunities by developing an equality action plan and tools for the recruitment and career of researchers. As part of the policy for attaining a better balance between men and women, especially in the area of public research, the

³¹ M.ERA.Net, ERA-net NORFACE, ERA-net NEURON, ERA-SysApp, ERA-net Transcan, JPND, ERA-CoSysMed.

NRF has set an average objective of candidacies of the under-represented gender of 40% through the ATTRACT programme and 30% through PEARL programme over a period of four years, it will increase the proportion of under-represented gender in its expert committees and it will set medium term objectives.

In parallel, the government actively supports optimizing the circulation and transfer of knowledge:

- The government has requested that the University of Luxembourg and other public research organisations publish their scientific articles by *Open Access* (OA) in as a much as possible. The government supports drawing up common guidelines in this area. The University of Luxembourg prefers the green pathway with its ORBiLu referential database that includes figures of citations/downloads, etc. The University also plays the role of facilitator for the development of OA policies for Luxembourg in the PASTEUROA project. The NRF is an active member of *Science Europe* and participates in the Open Science discussions. Currently, the NRF is encouraging the publication of OA through the *gold* pathway with specific financing schemes. The NRF seeks to make available the results of research financed by public funds. In the future, each publication financed by NRF must be published through OA. On the European level, Luxembourg participated in a *European Research and Innovation Area Committee Task Force* (ERAC) in the area of OA and is closely monitoring changes toward other OA models, regarding both publications and data.
- In 2015, the NRF developed the *Knowledge & Innovation Transfer Support* programme that will allocate competitive financing to research institutions in order to attract specialists in the area of knowledge transfer.
- The *Digital Lëtzebuerg* strategy is part of the EER digital framework and aims at reinforcing the position of the country with regard to ICT over time. In recent years, Luxembourg has experienced major development in technological companies working in the sectors of digital content, *cloud computing* and Big Data. The mass digitalization of the assets of cultural institutions of the State and their related services are also part of this digital strategy, just like the long-term digital information infrastructure and preservation programme that the National Archives and the National Library of Luxembourg (BnL) are currently setting up, in collaboration with the Centre for Information Technologies of the State (CTIE), in order to guarantee long-term access to digital archives and publications of all types.
- The BnL is the national documentary platform and it is actively pursuing its policy of national coordination, impulsion and technological innovation of documentary services for libraries and documentation centres. The national library network of Luxembourg (www.bibnet.lu), which is managed by the BnL, has 71 members and includes the scientific and research libraries of the country. The a-z (www.a-z.lu) portal was streamlined in 2015 to provide a single access to all types of collections, printed or digital, of all libraries that are members of the bibnet.lu network and the Luxembourg Consortium for the management of digital publications. Following BnL's membership in the *Virtual International Authority File* (VIAF) and by virtue of its cooperation with the National Centre for Literature, the BnL exported Luxembourg literary authors into the VIAF database. This integration project of Luxembourg authors into VIAF will be extended to other types of authors, which will contribute to increasing international visibility of Luxembourg's intellectual production. The Luxembourg Consortium for the acquisition and management of electronic publications, which is managed by BnL and which includes the University of Luxembourg as well as LIST and LIH, continued to increase its offering of electronic publications for public scientific requirements. A large part of this content is equally accessible to the general public. Consultation of electronic content also continues to grow. Negotiations are underway in view of increasing membership to the Consortium, in particular through the recent signing of a *Memorandum of understanding* with the Max Planck Institute Luxembourg, the national Health Laboratory and the Ministry of Civil Service. Now that a new *business model* has been adopted for the membership of new types of members, the required adaptation of the IT infrastructure of the Consortium is underway.

b. Measures for achieving the national target in private research

Despite the government's objective of diversifying the economy by reinforcing RDI and technological skills in particular, private investment in R&D remains below the national objective set for 2020, between 1.5 and 1.9% of GDP. Apart from the measures already taken in the past, the implementation of certain flagship projects that were analysed in 2014-2015 should provide a significant lever for private RDI.

- *National Composites Centre Luxembourg*: This is a centre whose operational concept is based on close cooperation between public and private players. Half of the financing, totalling €100 million, will be provided through private funds, several research thematics and specific PPPs. The centre will start operations in 2016 with 12 partner companies and the participation of LIST, the NRF, the Ministry of Research and Higher Education, the *Cluster Materials and Production Technologies* and the Ministry of the Economy.
- *High performance Computing and big Data enabled applications (HPC)*: After identifying the requirements of the players for a super calculator, the national scope project became a strategic project on the European level with the application for the Important Project of Common European Interest label. The project objective is to stimulate new HPC uses for industry and to ensure access to world scope installations by public and private research entities. In parallel, cross-functional applications have been identified and oriented toward the development of a *Smart nation*, such as *Fintech*, *Smart Space*, *Smart mobility*, *manufacturing 4.0* and others.
- *Joint Research Programme*: In collaboration with the NRF, this programme, which is in the process of being drawn up, has the objective of favouring long-term PPPs between research and technology organisations and industries, to increase the attractiveness of Luxembourg as an acknowledged *hub* dedicated to technological research and to develop the use of *testbed facilities* and living labs on the national scale.
- Implementation of a new law relating to the promotion of RDI: A draft law providing significant motivation for companies of all sizes to cooperate with public and private entities, to innovate with products and services and to participate in the production process is currently in the legislative process. It also extends the range of aid schemes. The existing law has only two of the nine initial schemes, which explains the perceptible drop in projects with grants.

In order to maintain a sustained rate of growth and to approach national objectives, a certain number of new measures were implemented, while others were continued by the government:

- The preparation of a smart specialization strategy in which the emphasis is placed on diversification in the economy, while concentrating on a limited number of specific sectors such as industry, eco-technologies, logistics, health technologies and ICT. This strategy is at its end phase and should be presented during the first half of 2016.
- Regarding cluster activities, the *Luxembourg Cluster Initiative* (Biohealth, EcoInnovation, ICT, Materials and Production Technologies, Automotive Components, Space) was launched, which actively encourages bringing the public and private sectors together in networks, as was an Automotive Campus³² - this is an industrial site specialized in R&D that offers an exchange of technologies and possibilities of synergies in an open framework that promotes innovation.

³² For more details see: <http://www.gouvernement.lu/5832700/24-schneider-campus?context=3422869>

- The Luxembourg Intellectual Property Institute (IPIL) will be officially operational in 2016. Its task will be to coordinate the implementation of public policy and to federate all involved entities, to develop and provide support and assistance services to companies, research entities, public institutions and all other interested parties, to develop and provide training programmes and promotional or awareness activities and to carry out projects and studies in order to advise the government.
- Support of start-ups has continued via the establishment of the *ICT seed* fund, whose launch is set for 2016. It is dedicated to innovative companies of the ICT sector and a commitment of public and private funds in the amount of €19.2 million that has already been validated. The *Fit4Start* programme will be continued through *coaching* and financing of *start-ups* of the ICT sector beginning from the start-up phase. The inauguration of the new *House of BioHealth* buildings, the activities of the national Technoport SA incubator including the *Fab lab*, which presents itself as an initiator of digital manufactures for students, the finalizing of the *Luxite* project for hosting companies working with ecotechnologies, the finalising of the 1535°C project for hosting companies working in the start-up field and artists, as well as the implementation of a cycle of 21 sessions on “*How to start a start up*” all constitute another group of measures taken in this framework.
- Support to SMEs and providing incentive to innovation are bolstered by continuing the *Fit 4 Innovation* programme, whose objective is to help SMEs free up resources for innovation, by launching the *Fit 4 Digital* in 2016, whose objective is to promote optimal use of ICT amongst very small entities (VSE), by supporting the participation of companies in using the *SME instrument* as part of the Horizon 2020 programme, and by launching the Innovation Club together with the Chamber of Trades and Luxinnovation as a forum for discussing the key factors of the success of innovation and the emergence of new ideas.
- In addition to the principal objective of the NRF, which consists in promoting scientific quality and excellence in research as well as its consolidation, a particular emphasis will be placed on public-private partnerships in both research programmes (CORE-PPP) and doctoral and post-doctoral (AFR-PPP) programmes. Geographic and inter-sector mobility are taken into consideration. As part of the mid-term revision of the multi-year agreement between the government and the NRF, the NRF will develop a partnership with the Ministry of the Economy with the objective of providing financial support for major, strategically important public-private projects that seek to generate new knowledge to face the technological challenges of the future for partners and countries and to establish Luxembourg as an innovation hub.

Regarding general activities for the support and promotion of innovation, the following measures were taken: the implementation of a Luxembourg portal for innovation and research that centralises RDI information, the establishment of Letzbio (www.letzbio.lu), which provides information in the area of life sciences, the “Business meets Research” forum, which offers on-site visits and bi-lateral encounters through innovation matchmaking ; the magazine FOCUS-Research and Innovation in Luxembourg promoting RDI in Luxembourg on the international level, training modules by Luxinnovation on the subject « How to learn to innovate in seven days » and the launch of the NRF Promoting Science to the Public (PSP) programme, which seeks to bring the general public closer to science in an interactive way. Along the same lines, on the European level, the online ENGAGE2020 instrument set up in 2015 offers support to policy makers, researchers and others in their efforts to bring the public closer to RDI.

With regard to the support of Luxembourg participation in European programmes, the following measures were taken:

- Luxinnovation, the national contact for Horizon 2020, counsels and assists researchers and companies in preparing their European projects³³.
- Some twenty thematic information sessions were set up to present financing opportunities involving a total of some thousand participants.
- The *Fit4Horizon2020* measure's pilot phase was launched in 2014-2015 to encourage SMEs to participate in Horizon2020 by covering a part or all the costs for submitting project proposals.

In conclusion, the government is seeking to better align its national RDI policy with that of the European Research Area (ERA), and expects to propose a national strategy based on the priorities of the ERA road map by mid-2016.

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”

4.3.1 National greenhouse gas emissions target

4.3.1.1 National target

In accordance with EU regulation 525/2013 the latest inventory of Luxembourg's GHG emissions covers the period between 1990 and 2014. It indicates that in 2014 total emissions amounted to 10.8 million tons of CO₂-equivalent, excluding international aviation and land use, land use change and forestry (LULUCF), some 437,000 tons of CO₂-equivalent fewer than 2013. Emissions have even decreased with respect to the record year of the decade, 2005, by 2.27 million tons of CO₂-equivalent, a drop of 17.4%, which brings them to the lowest levels since 2001 or 2002.

Table 9: Changes in GHG emissions, excluding LULUCF for certain selected years (in million tons of CO₂e)

Source	1990	1995	1998	2000	2005	2010	2011	2012	2013	2014	2014/2005	2014/2013
Production of heat & electricity	0,04	0,03	0,07	0,12	1,24	1,21	1,00	1,04	0,69	0,72	-42,0%	5,1%
Industrial production	7,89	4,26	1,91	1,95	1,88	1,68	1,70	1,54	1,42	1,40	-25,5%	-1,3%
Road transportation: national fleet	0,92	1,09	1,25	1,35	1,52	1,70	1,71	1,71	1,69	1,62	6,5%	-3,9%
Road transportation: export of road fuels	1,81	2,36	2,78	3,68	5,79	4,98	5,34	5,04	4,91	4,68	-19,2%	-4,7%
Households, businesses and services	1,31	1,47	1,64	1,75	1,76	1,78	1,49	1,63	1,67	1,50	-14,8%	-9,9%
Agriculture	0,73	0,72	0,72	0,75	0,70	0,75	0,73	0,71	0,73	0,74	5,1%	1,2%
Other sources	0,17	0,16	0,19	0,15	0,14	0,13	0,12	0,11	0,10	0,10	-26,5%	-1,6%
Total GHG emissions, excluding LULUCF	12,87	10,09	8,57	9,74	13,05	12,22	12,09	11,77	11,21	10,77	-17,4%	-3,9%

Source: Ministry of Sustainable Development and Infrastructures, submission of 2016v2 dated 15 March, 2016

For the 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 the years 2008-2010. Here, the economic crisis effect exercises a clear negative impact on Luxembourg, lowering its budget of emissions for 2013 and beyond. These yearly budgets are represented by annual allocations of emissions allowances (AAQE). Thus, for 2020, emissions outside ETS³⁴ should be limited to **8,145 million tons of CO₂**.

³³ For more details see: www.horizon2020.lu

³⁴ In view of the adjustment under Article 10 of Decision 406/2009/EC as published in European Commission Implementing Decision 2013/634/EU dated 31 October 2013. Amount stated using GWP from the fourth IPCC report in effect used in submitting inventories in 2015.

According to the latest projections given to the European Commission in March 2016, the government estimates that, for the 2013-2020 period, a possible "emissions reserve" of 0.9 million tons of CO₂e could be released in a central scenario, with current measures. Over this 8 year period, 2013-2014 inventories and 2015-2020 forecasts show that it is only in 2018 that the government should record an "emissions deficit" with regard to its AAQE.

Table 10: Indicative trajectory for GHG emissions, excluding LULUCF & ETS under EC decision 406/2009/EC (in million tons of CO₂e)

	2005	2008	2009	2010	2013	2014	2015	2016	2017	2018	2019	2020
Total GHG emissions, excluding LULUCF	13,05	12,17	11,65	12,22	11,21	10,77	10,49	10,34	10,32	10,30	10,30	10,34
Civil aviation emissions (Domestic flights)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
ETS emissions confirmed in CITL	2,60	2,10	2,18	2,25	1,85	1,92	1,77	1,76	1,75	1,74	1,73	1,71
Total GHG emissions, excluding LULUCF and ETS – ESD version	10,44	10,07	9,47	9,97	9,36	8,85	8,72	8,58	8,58	8,57	8,57	8,63
Annual emissions allowances – Decision 2013/162/EU					9,81	9,61	9,41	9,20	9,00	8,79	8,59	8,38
Contribution to the adaption of ETS processes under Art. 10 of ESD					0,28	0,27	0,27	0,26	0,25	0,25	0,24	0,24
Annual adjusted emissions allowances under Article 10 of Decision 2013/634/EU					9,54	9,34	9,14	8,94	8,74	8,54	8,34	8,14
Deficit (+) or reserves (-) of emissions compared to annual emissions allowances					-0,18	-0,49	-0,42	-0,36	-0,17	0,02	0,23	0,48
Deficit (+) or reserves (-) of emissions compared to annual emissions allowances - aggregate 2013-2020												-0,88

Source: Ministry of Sustainable Development and Infrastructures (based on the 2016v2 submission - 2005 to 2014 - and revised projections dated 15 March 2016 - 2015 to 2020)

Notes: The ETS emissions found in the CITL come from the European Environmental Agency's EU Emissions Trading System (ETS) data viewer (<http://www.eea.europa.eu/data-and-maps/data/data-viewers/emissions-trading-viewer>). 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.

In this case, the use of external credits should no longer be necessary. However, "reserve" or "deficit" calculations are highly uncertain due to their sensitivity to anticipated changes for a particular source of emissions, namely road transportation that represents almost two thirds of total emission, excluding ETS.

4.3.1.2 Key measures³⁵

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 transportation, building, energetic efficiency and renewable energies, to industries, to information and awareness campaigns, to consultancy and energy training.

In the field of transportation, Luxembourg is seeking a true paradigm shift thanks to the implementation of actions and projects on a national and cross-border level:

The government will ensure implementation of the global strategy for durable mobility (MoDu), published in 2012. MoDu draws notably on the concept of developing public transportation. Efforts to increase the modal share of public transportation and soft mobility are transposed by a significant improvement in products for this phenomenon and a progressive extension of infrastructure on the domestic and cross-border level. Works that just started for the commissioning of a new *tramway* system in Luxembourg City are emblematic of this change. Implementation of the first phase is scheduled for 2017 and the completion of the Findel - Cloche d'Or line is scheduled for 2020-2021. As an example, the share of cross-border commuters using public transportation increased from 9% to 14% between 2007 and 2010. Domestically, a 25% increase in the number of rail passengers was achieved from 2009-2014. MoDu is also targeting an objective of 25% of daily trips through soft

³⁵ Also see chapters 3.1, 4.3.2 and 4.3.3

mobility. As an example, in 2015, the new law on the national cycling network expects to increase the nation's cycling network by 133%. Lastly, MoDu targets the development of a quasi-real time telematics information system for public transportation systems. MoDu's strategy with its Transportation Sector Plan (PST) recommends a series of other measures such as the installation of a high capacity and high frequency transportation system in the capital, the promotion of electric-based mobility or the introduction of an ecological mobility label for companies. With the PST and the Landscaping, Housing and Economic Activities Zone sector plans, the role of territorial development is strengthened, highlighting the principal objective in mobility as reducing distances between work and home. In 2014, the PST, together with the landscaping, housing and economic activity area sector plans was submitted to Parliament and to the Municipalities and is in procedure. Because of challenges to several of the provisions and a number of formal objections by the State Council, the government decided to remove Grand-ducal regulations stating that sector plans were mandatory from the proceedings phase and to first amend the law on territorial planning in 2015 in order to then rework the draft PST³⁶.

Apart for the development of sustainable mobility on the national level, the government is persisting in its strategy of developing alternative systems for cross-border traffic. An initial section of this strategy took solid form through the development with French authorities of a Cross-border mobility scheme (SMOT) in 2009, which since then has continued to exist in the form of a bilateral cooperation agreement between Lorraine and Luxembourg. The process is based on the implementation of soft parameters in terms of rates, means of communications, etc. It also addresses developing the organisation of public transportation systems for rolling stock, timing of railway service, etc. As an example, with the rail network, the cross-border offer will be improved when the timing of railway service in the TER Métrolor network is implemented in 2016, which will increase seating from 15,000 to 25,000. It was finalized and politically validated in Wallonia in 2015, and the measures selected aim to gradually increase the modal share of alternative transportation means, to include public transportation, ridesharing, Park and Ride and soft-mobility, of all movement in the study area incorporating Luxembourg, the province of Luxembourg and the province of Liège. The aim is to promote public transportation for cross-border travel by reinforcing rail infrastructure and implementing bus facilities, as well as Park and Ride and ridesharing options. For the Rhine-Palatinate and Saar regions, the objectives are the same. In 2015, a diagnostic of the current situation in terms of demographics and mobility was prepared and a follow up strategy was selected. A political agreement was targeted for 2016.

With regard to residential buildings, apart from the implementation of sector-based housing, an ambitious schedule has been prepared for progressively strengthening requirements in terms of energy performance in new buildings and residences. Thus, by 2017, all new building construction will have to comply with the AA energy class, making Luxembourg the first EU state to require this level of energy performance. As energy refurbishment is costly, the government is implementing a "climate bank" that seeks to finance energy refurbishment projects with reduced or zero interest rates for low income families. For commercial buildings, Luxemburg intends to establish new financing methods to achieve progressive improvement on all existing construction and has already established an inventory of central government buildings impacted by the European energy efficiency directive.

With regard to energy, the measures supporting renewable energies and the promotion of energy efficiency are actively in place. An update of the study on the potential of renewable energies will be finalized during 2016.

³⁶ Also see chapter 6.1

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.

Lastly, with regard particularly to the taxation of energy products in transportation, the government decided to raise the standard VAT of 15% to 17% beginning in January 2015 and at the end of February 2016, presented the first elements of a tax reform³⁷ slated for application in 2017.

4.3.2 Renewable energies objective

4.3.2.1 National target

Directive 2009/28/EC dated 23 April 2009 for promoting the use of energy produced 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 fuel energy from renewable resources in the transport sector for 2020.

Table 11: Indicative trajectory for the share of energies produced from renewable sources in the use of final energy

Year	Percentage
Average 2011-2012	2.92 %
Average 2013-2014	3.93 %
Average 2015-2016	5.45 %
Average 2017/2018	7.47 %

Source: Ministry of the Economy

The share of renewable energy in final consumption amounted to 4.54% for 2014. The contributions to this objective by the various sectors were 5.94% for electrical energy and 7.37% for heat and cooling production. The portion of renewable energy used in transportation came to 5.25%. With regard to adherence to the trajectory, Luxembourg exceeded its objective of 3.93% of renewable energies in final use of energy, with the achievement of a rate of 4.1% for the years 2013 and 2014.

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 use domestically 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

A description of these measures, as well as the schedule for implementing them, is described in the national renewable energy action plan. The principal recent actions taken as part of these measures that have an impact on the development of renewable energies are mentioned hereafter.

a. Expansion of renewable energies on national territory

³⁷ See chapter 3.1.

In the area of supporting biogas production installations and biogas injection into gas networks, the government carried out a profitability analysis on the three existing facilities in 2013 to 2014. This study concluded that an increase in the price of injected biogas was necessary to guarantee the medium term functioning of the plants concerned. A Grand-ducal regulation taking into account the results of this profitability study was introduced into the regulatory procedure at end-2014 and state aid was approved by the European Commission at the end of 2015. The Grand-ducal regulation relating to this went into effect in early 2016.

In 2015, the government continued to explore the possibility of introducing a feed-in tariff for heat originating with installations fuelled from biomass recovery processes.

A Grand-ducal regulation³⁸ sets a clear schedule for increasing requirements in the area of energy performance in new residential buildings and additions to existing residential buildings. Beginning in 2015, stricter regulations for residential buildings of an average Class B to A rating went into effect, and beginning in 2017, new residential buildings must meet generally all the highest performance classes of the A-A energy performance certificate, which is the standard for buildings with near zero energy use. The new requirement levels also contain an implicit incentive to implement renewable energies.

Since January, 2013, a new regulation has been in effect pertaining to aid schemes that promote the rational use of energy and highlight renewable energy sources in the housing sector for 2013-2016. These regulations are intended to accelerate the implementation of energy efficient technologies and renewable energies in the domestic sector.

In 2013, the government analyzed the amount and structure of feed-in tariffs regarding electrical production based on renewable energy sources and submitted a reform based on the analysis into the regulatory procedure. With the authorization on state aid by the European Commission, the new regulations including new feed-in tariffs related to the production of electricity using renewable resources entered into effect in 2014³⁹. A new draft regulation to modify the regulation cited above was introduced into the regulatory procedure in July 2015. Beginning in 2016, this regulation aims at adapting grants for operating process to be allocated to the new electricity production facilities that use renewable energies for fuel and that produce nominal electrical power in excess of 500 kW, or greater than 3 MW or 3 wind power production units. Producers will be obliged to sell the electricity produced on the market. Consequently, these new plants will no longer receive the feed-in tariff, but rather a market premium to be added to the market price of their production. The European Commission has however not yet authorized state aid for this process.

In 2015, the government worked on updating the study of the potential of renewable energies in Luxembourg in order to determine the progress achieved and achievable in the various renewable energy production sectors that should serve as a basis for reviewing the potential of the various technologies by 2020. The finalization of the study on this issue is set for 2016.

³⁸ Grand-ducal regulation dated 5 May 2012 amending: 1. Grand-ducal regulation dated 30 November, 2007 concerning energy performance in residential buildings, 2. The Grand-ducal regulation dated 31 August, 2010 concerning energy performance in commercial buildings.

³⁹ The Grand-ducal regulation dated 1 August 2014 regarding electrical production based on renewable energy sources.

b. Mix of biofuels in fuel available for consumption nationally

By way of an amendment to the amended law dated 17 December 2010 setting the excise and other taxes on energy products, electricity, manufactured tobacco products, alcohol and alcoholic beverages, the percentage of biofuels added to gasoline and diesel fuel was increased to 5.40% of energy content for 2015. For 2016, this percentage will be raised to 6.58%. The directive will make it mandatory to include a minimum of 10% of biofuels in all gasoline and diesel for transportation use by 2020, with the result that percentages of biofuels in fuel will increase continually.

c. Electric mobility

A technical-economic study carried out by the government and the Institut Luxembourgeois de Régulation (ILR) resulted in producing a shared national concept for implementing electric mobility in Luxembourg. The conclusions of this study are in a law determining the major principles for the development of electro-mobility in Luxembourg⁴⁰. On the basis of this study, the government set the objective of installing some 800 public charging stations for electric powered vehicles by 2020. A Grand-ducal regulation⁴¹ determining the functionalities and technical specifications, the number of charging stations to install, the overall scheduling and the organization of a charging infrastructure for electric vehicles in Luxembourg was published in 2015. Another objective of the regulation is to specify the public installation, operation and maintenance of the public charging infrastructure that will have to be provided by grid managers and future users of this infrastructure. Discussions with grid managers relating to the specifications for charging terminals were finalized in 2015. In February 2016, an overall plan indicating locations of stations was published that determines which Park and Ride and ride sharing facilities to equip with charging stations, as well as the number of terminals to install in them. It also determines the number of public charging terminals to install in each municipality at public and private parking locations.

Electric mobility is also part of a cross-border context. The INTERREG IV A “ELEC’TRA” project was initiated in 2012 with this in mind. The concept focuses on setting up intermodal “e-Hub” platforms along the primary cross-border routes, to include Metz-Thionville-Luxembourg, Sarrebruck-Luxembourg, Trèves-Luxembourg and Sarrebruck-Forbach, with the objective of decreasing the number of individual vehicles travelling along these routes. The e-Hubs will be located on the first mile and last mile of a primary link to be used to change from one transportation mode, preferably electric, to public transportation or e-ride sharing, and vice versa. A focused survey was carried out in 2014 as part of this effort amongst cross-border workers and their employers to analyse the potential of the solutions planned through this concept and to provide data essential for the study. The data collected was used to make a simulation model that can predict flows over time and space during work days for a population of 55,000 cross-border workers living along the three routes being analysed. It was possible to determine an overall potential for electric mobility, which turned out to be around 10%, and thus to identify potential users for this project. Lastly, the simulation model was used to determine the optimal locations for the e-Hubs. Through the project, an innovative survey was carried out on cross-border mobility and thus helped create a simulation model for calculating the potential of a location for hosting a charging station.

d. Infrastructures for alternative fuels

Directive 2014/94/EU states that each Member State shall perform an evaluation of the current situation and the development perspectives of the alternative fuels market in the transportation

⁴⁰ The law dated 7 August, 2012 amending the law dated 1 August, 2007 relating to the organization of the electricity market.

⁴¹ Grand-ducal regulation dated 3 December 2015 relating to public infrastructure linked to electric mobility.

sector. Each Member State must submit a framework for national action including this type of evaluation up until November of 2016, as well as national targets relating to the installation of infrastructure for alternative fuels such as electricity, CNG, LNG and hydrogen, and what measures to implement to ensure that the targets are achieved. For this, the government contracted with a design office to carry out a specifications and financial study for use in setting up the principal elements required for carrying out this type of national action. The initial phase of this study has just been completed. Its objective was to carry out a status evaluation of the alternative fuels market in Luxembourg and abroad and to analyse the development outlook of this market in Luxembourg, taking into account trends in neighbouring countries. The project's second phase seeks to develop and analyse target scenarios for developing this market, taking into account the economic and environmental potentials of the various alternative fuels. The study will be finalised in March 2016 and the national policy framework for Luxembourg will be drafted subsequently.

e. Mechanisms for cooperation

The government is in contact with a certain number of Member States likely to exceed their objectives, with a view to discussing possibilities for cooperation. Discussions and negotiations were pursued in 2015. A final decision for completing a statistical transfer and a shared project has yet to be made. Nonetheless, the achievement of the 2020 objective will occur by resorting to the maximum levels of national potentials.

4.3.3 National energy efficiency objective

4.3.3.1 National target

Luxembourg has set the **objective** for energy efficiency of **annual final energy use not to exceed 49,292 GWh** by 2020, i.e. **4,239.2 ktoe**, or 52,111 GWh and 4,481.6 ktoe of primary energy⁴². Apart for the energy efficiency objective, Luxembourg also set an energy savings objective of 5,993 GWh to be achieved by 31 December 2020. Luxembourg intends to achieve all of its energy savings objectives by means of an obligations mechanism in the area of energy efficiency implemented in 2015. Although the energy savings objective is not related to the energy efficiency objective in the sense that it is totally independent of changes in annual final energy use, the obligations mechanism in the area of efficiency is one of the primary instruments that should be contributing to achieving the energy efficiency objective.

4.3.3.2 Key measures

A draft Grand-ducal regulation amending the amended Grand-ducal regulation of 30 November 2007 on energy performance in residential buildings was introduced into the regulatory procedure in 2015, which seeks to modify certain provisions relating especially to:

- the opening related to persons authorized to prepare feasibility studies
- the introduction of an accurate definition of “residential building with near-zero energy use”
- the modification of minimum requirements related to protection against summer heat
- clarification of benchmark energy surface area
- the introduction of the possibility of taking into account a portion of electricity produced by photovoltaic equipment
- adaptation of the calculation methodology for overall requirements
- alignment of the energy requirement calculated on the basis of measured energy use

⁴² In application of Article 3 of EU directive 2012/27/EU relating to energy efficiency. The energy efficiency objective for 2020 is therefore no longer expressed percentages but rather in absolute values of final energy used.

A Grand-ducal regulation amending the amended Grand-ducal regulation dated 31 August 2010 relating to the energy performance of administrative buildings that increases requirements for energy performance of new administrative buildings beginning on 1 July 2015 was published in 2015. Administrative buildings for which a building application is submitted after 1 July 2015 must adhere to the stricter requirements in the area of energy performance that correspond to current energy Class C standards. A draft Grand-ducal regulation amending the amended Grand-ducal regulation dated 31 August 2010 relating to energy performance in administrative buildings is in the regulatory procedure and relates to the modification of certain technical details and opening up the field of persons authorised to perform feasibility studies. Work to arrive at a definition of “administrative buildings with near zero energy use” and to determine a schedule for increasing requirements in the area of energy performance continued in 2015.

The government also worked up a long-term strategy for launching investments in the renovation of the nation's residential and retail buildings, both public and private, under EC directive 2012/27/EC. This strategy was incorporated in the third action plan for energy efficiency.

Two laws, one amending the amended law dated 1 August, 2007 relating to the organization of the electricity market⁴³ and the other amending the amended law dated 1 August, 2007 relating to the organisation of the natural gas market⁴⁴ were published in June 2015. These two laws transpose the various provisions of the Directive into national law, notably articles 9 to 11, which provide for active involvement of end users on the gas and electricity markets by providing actual consumption data of electricity and natural gas in their statements and invoices. This data will help them to regulate their own energy use. It also involves users by bolstering the measures related to the installation of intelligent meters in new and existing buildings. A legal basis may also be found in the laws for the energy efficiency obligations mechanism targeted in Article 7 of the Directive. A Grand-ducal regulation relating to the functioning of the obligations mechanism relating to energy efficiency was established on 7 August 2015. This regulation obliges providers of electricity and natural gas for end customers in Luxembourg to achieve aggregate overall energy savings of 5,993 GWh between 1 January 2015 and 31 December 2020.

A study to determine the optimal energy performance level depending on costs has been planned.

The government has also prepared an inventory of all buildings belonging to the central government that are heated and/or cooled with total useful surface area in excess of 500 sqm. With this inventory as a basis, Luxembourg has set up a strategy for improving the energy situation in government-owned properties, with the objective of increasing energy performance by annually renovating 3% of the total surface areas of these buildings.

In the area of cogeneration, the government is supporting the development of cogeneration based on renewable energies as a priority over cogeneration activities based on fossil fuel sources. Feed-in tariffs for these were established by the Grand-ducal regulation dated 1 August 2014 regarding electrical production based on renewable energy sources.

⁴³ Law dated 19 June 2015 amending the amended law dated August 2007 relating to the organisation of the electricity market; Amended law of 30 May 2005 relating to 1) the organisation of the Luxembourg Institute of Regulation; 2) amendment to the amended law dated 22 June 1963 setting the scheme for State functionary salaries.

⁴⁴ The law dated 19 June 2015 amending the amended law dated 1 August, 2007 relating to the organization of the natural gas market.

As part of its rational use policy for energy, the government continued to promote adherence to voluntary agreements with the industrial sector covering the period 2011-2016. The purpose of this agreement is to further solicit the commitment of participating companies to improving energy efficiency and to implement new and renewable energy sources. Companies signing the agreement further commit to implementing an energy management system that identifies potential improvements in energy efficiency and establishes an action program to produce a package of measures to achieve this potential. The economic interest grouping *myenergy* is taking over the coordination and follow up roles of data provided by companies, as well as information dissemination, consulting and awareness responsibilities.

Intelligent metering systems that determine a framework and schedule for the roll-out of a national shared and interoperable infrastructure of intelligent metering were submitted for legislation. These systems promote active participation of consumers on natural gas and electricity markets based on a shared central system used to communicate data through a single common system, for electricity and natural gas at a minimum. The framework and schedule were incorporated into legislative texts. The overall launch of this system, which was to begin in July 2015, was put off one year. This type of intelligent metering equipment must be in use by at least 95% of end users of electricity by 31 December 2019, and by 90% of end users of natural gas by 31 December 2020. The government closely monitored preparations for the installation process of intelligent meters in Luxembourg, carried out in concert with the gas and electric companies and coordinated by the ILR. Consequently, a Grand-ducal regulation states the methods and scheduling or rhythm of meter readings, use and communication of metering data, right of access to the meters and how long data is to be conserved.

With regard to this, it should also be mentioned that in September 2015, le government, the Chamber of Commerce and IMS Luxembourg jointly embarked on a strategic study entitled “The Third Industrial Revolution Strategy”, in close collaboration with the US economist Jeremy Rifkin. This wide scale strategic study, slated for completion by end 2016, is intended to make the existing economic model more durable and interconnected, placing special emphasis on converging ICT, energy and transportation operating within an intelligent network.

4.4 The Education objective and key measures for achieving it

European Objective: *"improving education levels, in particular by aiming to reduce school drop-out 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

Luxembourg is aiming at the European benchmark criteria and has set a national objective of sustainably maintaining the dropout rate **below 10%**.

In 2014, Luxembourg registered an average school dropout rate of 6.1% (Eurostat). National data are also being used as measurement tools for this national objective because the indicator calculated by Eurostat that came out of the Labour Forces Survey is not totally representative of Luxembourg. In Luxembourg, a centralized IT management system for students can effectively identify those young people who leave school without obtaining any diploma or certification, either during or at the end of the academic year. A monthly report on these young people who have quit school is sent to the Local Youth Action (ALJ) regional offices, who contact these youths in order

to determine why they decided to abandon school and to help them get into a training programme or the labour market.

Table 12: 2003-2014 rate of early school leavers

Study		Number of students leaving school	Period length	Average number monthly	Dropout rate
1	2003-2004	1,984	12 months	165.3	17.20%
2	2005-2006	2,422	18 months	134.6	14.90%
3	2006-2007	1,320	12 months	110	9.40%
4	2007-2008	1,928	12 months	160.7	11.20%
5	2008-2009	1,690	12 months	140.8	9.00%
6	2009-2010	1,660	12 months	138.3	9.00%
7	2010-2011	1,888	12 months	157.3	9.00%
8	2011-2012	1,680	12 months	140.0	9.20%
9	2012-2013	1,643	12 months	136.9	11.60%
10	2013-2014	1,699	12 months	141.6	13.00 %

Source: Ministry of National Education, Children and Youth

4.4.1.2 Key measures

All the measures described below aim to assimilate the considerable complexity of Luxembourg's academic system, which is characterized by an increasingly heterogeneous population of students, rapidly evolving requirements in the labour market and increasing uncertainty in determining medium and long-term strategies with regard to staff and institutional requirements. The invariable feature of the process in Luxembourg is, after a fashion, the multiplicity of the various action levers available, which lends an undisputable national coherence to the system's action.

The measures already put in place by the government, as well as those being implemented now, coincide with the main conclusions of the symposium on the struggle to keep youth in school that Luxembourg set up in 2015 under its EU Council presidency:

- Implementation of a national strategy to overcome the problem of academic dropouts: An education summit meeting in December 2015 was dedicated to academic success. This constitutes the starting point for reflecting on how to draw up a national strategy to keep youths in school. In 2016, an Observatory for school maintenance was established. It will coordinate efforts to support students who risk dropping out and will initiate innovative processes for leading them to recognised certification programmes.
- Promote prevention by sparking synergies in the regions: Academic and professional guidance programmes will be better and more consistent following draft law 6787 dated 6 February 2015 relating to setting up the Guidance Centre. Single windows will be set up in the regions. They will assemble academic and non-academic professionals in one location to provide better service to parents and students.
- Developing an overall approach to school: The draft law on academic and professional guidance will introduce the obligation of each school to determine its own approach to guidance counselling. Collaboration with parents will be supported, especially in the lower academic grades of secondary and secondary technical schooling. Cultural projects will be promoted, especially for weaker students in the preparatory scheme, which will help these youths to learn differently and to discover talents and promote them.
- More flexible and transparent academic transitions: The fourth cycle guidance policy of primary education will be adapted to increase the participant's sense of responsibility and to support

them better, to account for a more diversified academic programme and to bring primary education closer to secondary education. Profiles will be established for youths in the tenth form to enter professional training programs. These will orient students in their preparation to move into various training programmes and will lead to more specific guidance toward desired training.

- A more diversified academic programme: French options are available in the lower forms of secondary school as from the 2015-2016 academic year in two Lycées. The VTT (*Verhalen, Testen an Trainéieren*) structure offers an academic programme and supervision for youths aged between 11 and 15 years with severe behaviour problems and who risk dropping out of school. The PAS (*Plateforme Accrochage Scolaire*) programme is a mechanism that was implemented in 2013 that seeks to systematically evaluate the risk of leaving school amongst students in the tenth form of secondary technical education, as those in the fourth form of secondary education, through individual supervision and involvement in the classes. Establishing academic programmes and improving existing ones for students in difficulty, done through the Second Chance School, cultural classes for students with behaviour difficulties, special classes for students held back a year and guidance and professional introductory courses (COIP) are other measures employed in this area.
- Initial and continuing training for teaching and socio-educational staff: A Bachelor of Educational Sciences will be instituted. It will place special emphasis on specific cognitive disorders, such as language and learning disorders like dyslexia, dysorthographia, dysphasia, dyspraxia and dyscalculia. A Master's Degree in Secondary Education will be offered at the beginning of the 2016-2017 school years. The Training Institute of the Ministry of National Education, Children and Youth will set up a consistent mechanism for professional work practices and continuing education for all teaching and socio-educational staff.
- A stronger remedial programme: Each secondary school will prepare a remedial programme process with extended autonomy. A wider margin for manoeuvre will be granted to schools so as to allow them to make pedagogical choices that fit their specific requirements.
- Reinforcing the link between parents and schools: The government intends to implement representation systems for parents that have firmer footing in secondary and secondary technical education. With regard to professional and academic guidance, collaboration with parents will be supported, especially in the lower academic forms of secondary and secondary technical schooling.

In addition, a systematic follow-up of school dropouts will be continued by Local Youth Action (ALJ). The government is also working on preparing family learning formats and campaigns to make families aware of the importance of supporting their children in their academic careers, and of the impact this type of support has on their motivation levels and success.

Adult education will offer a new mechanism that will bring young people and adults who have not achieved the 9th grade level in academics under the alternative qualification programme in order to achieve their professional projects. The training is based on 9th form practical, 9th form multi-skills and 9th form technical class programmes that lead to the Professional Competence Certificate (CCP), to the Professional Aptitude Diploma (DAP), to technician training and to the technical scheme. The educational project is formalised by a training agreement and at the end of the programme participants receive a grade report, a description of skills attained and a guidance recommendation.

Lastly, the Comenius Regio cross-border project "*La culture au service de la réussite scolaire*" (Culture at the service of academic achievement), the Erasmus+ project "Training Without Borders", which is a European project involving the Greater Region of Luxembourg, France and

Belgium, and some fifty projects against academic exclusion in around twenty secondary schools, which promote keeping kids in school and which the government will continue.

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 receive tertiary education and earn tertiary degrees between now and 2020. This objective was set at the time when two out of three jobs in Luxembourg require higher education training. Over the years, the rate of persons holding a university diploma increased from 36% in 2006 to over 50% in 2015.

4.4.2.2 Key measures

The 2013-2014 academic year signalled the implementation of a reform of the State financial aid schemes for higher education in which the children of cross-border workers became eligible for such aid. A new reform of the State financial aid scheme for higher education was carried out for the 2014-2015 academic year, entering into effect in August 2014 via the law dated 24 July 2014 on State financial aid for higher education. Financial aid components for university studies are still loans and grants, with the latter broken down into different categories: Basic grants, mobility grants and social criteria grants. In contrast to previous legislation, the new system has a modular structure that introduces an element of social selectivity. As with prior legislation, an anti-overlap mechanism is present to avoid discrimination between the various target groups. The financial aid is moveable in the sense that Luxembourg students are free to choose the nature and country of their studies.

The significant increase in aid for the 2013-2014 academic year is due to European Court of Justice Decision C-20/12 making the children of cross-border workers eligible for grants. The decrease in bursary amounts paid out for the academic year 2014-2015 may be explained by the entry into effect of the new legislation.

Table 13: Table of financial aid awarded since the 2009-2010 academic year

Academic year	Total number of students receiving aid	Total amount paid out as bursaries in Mn €	Amounts granted as loans in Mn €
2009/2010	8,562	14.8	55.0
2010/2011	13,324	83.8	87.1
2011/2012	14,382	90.8	94.0
2012/2013	15,587	98.7	102.5
2013/2014	25,205	154.3	161.6
2014/2015	25,594	91.4	177.0

Source: Ministry of Higher Education and Research

A revision of some of the provisions of the law dated 24 July 2014 has been planned for the 2016-2017 academic year. The draft law relating to this was adopted by the government in March 2016. It will exert a budgetary impact on the following points:

- Mobility grants: An increase of the semester amount for mobility grants from €1,000 to €1,225, which will have an annual impact based on academic year 2014-2015 figures of €4.79 million.
- Social bursaries: Increase of the semester amounts of bursaries based on social criteria of an average of 20.8%, resulting in an annual impact of €56.38 million. A social bursary may be granted where families with prospective students have incomes lower than the minimum wage

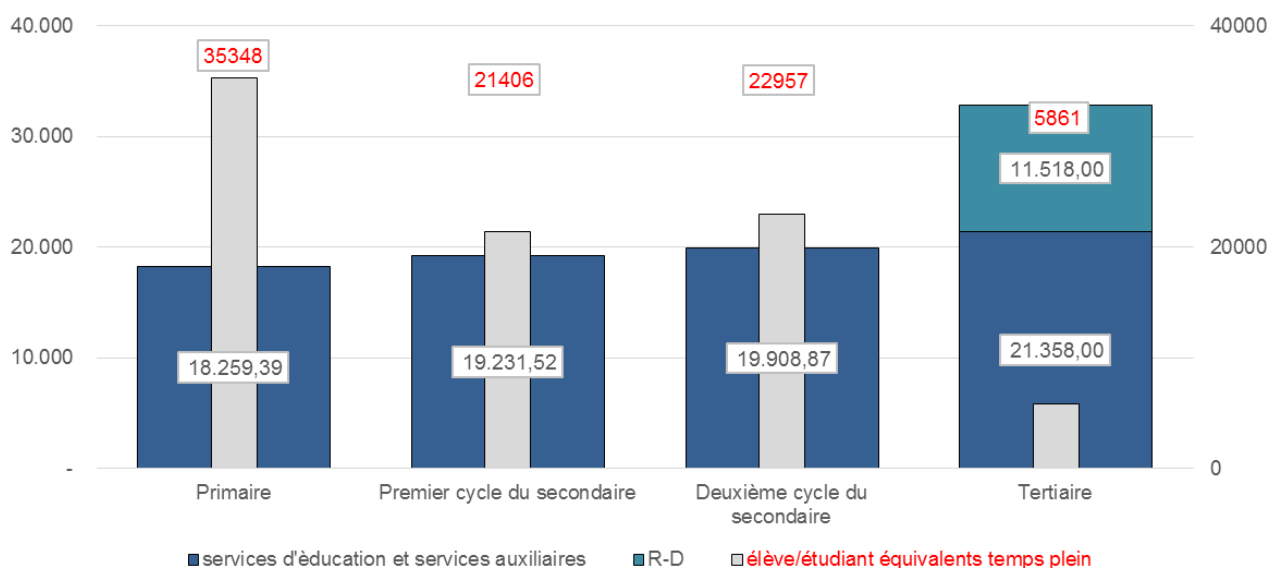
(SSM) or for non-qualified persons, from 1 to 1.5, from 1.5 to 2, from 2 to 2.5, from 2.5 to 3, from 3 to 3.5 and from 3.5 to 4.5 times the minimum wage.

- Eligibility: The information provided in terms of eligibility for higher education studies will from now on make students eligible for financial aid that are pursuing studies outside of the Member State that recognises the academic programme as covered by its higher education system. The definition of eligibility of programmes for financial aid is fitted to that used for registering for a grade, diploma or certificate in the registry of higher education qualifications as recommended in draft law 6893 relating to recognition of professional qualifications. In this way, students cannot register diplomas or certificates in the above-mentioned registry although they were refused a financial aid grant from the State.
- Disabled students: Furthermore, students with acknowledged disabilities may now obtain bursaries or loans for a maximum number of two additional semesters per cycle with relation to current regulations for first cycle, second cycle and the research training cycle, for a maximum number of four additional semesters compared to current regulations allowing only studies of a single cycle.
- Use of an indexing system for the various bursaries: Beginning with the academic year 2017-2018, the amounts of the various bursaries, i.e. basic bursary, mobility grants, social bursary and family-based bursary, will vary proportionately to changes in the threshold for sliding wage scales as calculated by STATEC.

Another way of achieving the national objective is to expand the offer of public and private higher education possibilities. In May 2015, three additional shorter professional programmes of a BTS technical certificate course were accredited, bringing the number of accredited BTS programmes to 24 for the 2015-2016 academic year. In addition to this, since 2013-2014 a cycle of shorter higher education studies have been in place as preparatory classes to competitive examinations for entry into the major French business schools. Furthermore, the range of private programmes offered was extended for the 2015-2016 academic year, with 32 accredited programmes offered compared to 26 in 2014-2015.

The government continues to implement a strong policy regarding higher education and research in terms of financial resources. Financial contributions for the operational side of the University of Luxembourg have increased considerably. The State's allocations for operating the university increased from €72 million in 2009 to €101.6 million in 2012 and in 2016 amounts to €154.1 million. The number of students also increased from 4,934 in the 2009-2010 year to 6,172 in 2015-2016.

Figure 1: Annual expenses of Luxembourg educational institutions per student, by type of service, according to the level of education (2012) in USD equivalents (PPA), calculation based on FTE.



Notes: Primary, First cycle of Secondary, Second cycle of Secondary, Higher Education Educational services and auxiliary services / R&D / Full-time equivalents students

Source: Ministry of Higher Education and Research

The growing demand for high quality university education, together with the government's determination to expand access to higher education, resulted in higher unit costs. In order to achieve these objectives in a financially effective manner, the government has adopted procedures whose purpose is to perform a comparative analysis of changes in higher education costs in universities. This led the government to produce financial statistics for the first time in the area of higher education and to comply with EU regulation no. 88/2011 issued by the Commission on 2 February 2011⁴⁵. Compiling these statistics is useful for comparing expenses in the area of higher education with those in other countries. Luxembourg is in a category above other OECD countries with regard to expenses per student in higher education and university R&D programmes, which amounted to €32,876 euros in 2012. More is spent also on primary and secondary education in Luxembourg. Expenses per student in higher education are in line with expenses per student for primary and secondary education.

The University of Luxembourg moved into the Belval site at the beginning of the 2015-2016 academic year. Investments in higher education and research infrastructure in the Belval site are continuing, with a total investment of €800 million planned over the period 2010-2019. A total of 7,000 students and 3,000 teachers and researchers are expected over the medium and long terms.

⁴⁵ Which executes EC regulation no. 452/2008 of the European Parliament and Council relating producing and developing statistics on lifelong education and training, with regard to statistics on educational and training systems.

Table 14: Total number of students at the University of Luxembourg by academic year

Year	Number of students
2009-2010	4,934
2010-2011	5,177
2011-2012	5,686
2012-2013	6,288
2013-2014	6,157
2014-2015	6,277
2015-2016	6,172 (p)

Source: Ministry of Higher Education and Research

4.4.3 Strengthening the human capital base through adult education and training

The law dated 18 April 2013 provided for a new National Library (BnL), for which construction began in 2014 and whose opening is slated for 2018. With its new building, BnL will rationalise and modernise its operations by grouping all of its collections and services into a single site. This will increase attractiveness and visibility in the eyes of the public. Expanded human capital base and lifelong learning structures will be driven by the creation of an infrastructure that has sufficient, appropriate and attractive space to increase the directly accessible documentary range of paper and digital media. This documentation, supported by high connectivity, will go hand in hand with high level documentary and consulting services and longer open hours for BnL.

In parallel, BnL is working to continually modernise its bibnet.lu network, which has 71 member libraries. Through this network, even small libraries have high performing IT infrastructure. The unified a-z.lu search engine developed by BnL for the network is a powerful tool for permanent training that can be used to view and access the country's entire documentary asset base from any location in Luxembourg and the Greater Region. In 2015, BnL jointly conducted an e-books project, www.ebooks.lu with eleven public reading libraries, providing these libraries with a multilingual offer of over 78,250 e-books. By integrating the catalogues of mobile libraries consisting of two book vehicles into the collective catalogue of the bibnet.lu network, visibility of its collections was increased, leading to a greater number of users in 2015.

BnL also took measures to facilitate the access of refugees to its collections, in particular to the language learning tools for the country's languages.

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 this European Council objective and has set a national objective of **reducing the number of persons threatened by poverty and social exclusion**⁴⁶ in Luxembourg

⁴⁶ 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.

by 6,000 people in 2020. The government supports 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 figure 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. The employment rate is increasing in Luxembourg, a phenomenon that is largely due to the increase of the employment rate of women⁴⁷.

4.5.2 Key measures

The government continued to take steps intended to modernise family policy by promoting employment, especially for women, and keeping people in jobs so that parents can have financial independence. A draft law to reform parental leave was submitted in January 2016. This reform aims at promoting reconciliation between family and professional life, creating a strong relationship between parents and children, better addressing requirements of parents and increasing the percentage of fathers who benefit from it in order to promote equal opportunities. It also aims to increase the number of persons in general who benefit from the reform.

Achieving the national objective for social inclusion is supported by the measures outlined in the national employment and education objective⁴⁸, as well as the following measures:

- Continue the policy of providing socio-educational welcoming structures to children: The number of authorized places in socio-educational welcoming structures for children 0-12 years old was 51,124 at 31 December 2015. Luxembourg therefore has widely exceeded its national objective of 35,000 places in 2015.
- Making beneficiary parents aware of the Guaranteed Minimum Income (GMI) mechanism for using welcome centre checks: Luxembourg achieved its national objective, since the awareness campaign with the target population was successful (see the measure for the offer policy above).
- Increasing activation rates as part of the GMI mechanism: The number of professional insertion activities (PIA) set up under this has continuously increased⁴⁹ since 2007, but given the constant number of qualified agents, a high level ceiling appears imminent, even though the administrative statistics report a stabilizing of the number of persons not exempted from PIA⁵⁰. The activation rate for 2015 stayed at 59.1% compared to 58.7% in 2014, below the rate of 64.3% targeted for 2020, and support for achieving the object by all possible means is still recommended.
- Promote measures favouring the transition of young people from academic to professional life and those motivating them to return to school: The government delved into the problematic of disadvantaged young people through the National Youth Service (SNJ), particularly qualified young people with NEET profiles (Not in Education, Employment or Training). The challenge is to inform young people about their opportunities through the ANELO platform and the information fairs, to incite them to return to an activity by offering them practical workshops, offering peer support under the Level Up programme and adapting existing offers or create new ones based on the results of the NEET study. Volunteer service programmes are adapted to make them more accessible to young people with few opportunities. All of these activities and projects for SNJ were implemented in 2015 and will be continued in 2016. Certain financing by the ESF expired in 2015, including ANELO and the NEET study, and other financing will begin

⁴⁷ STATEC, *Rapport Travail et cohésion sociale 2015*, Luxembourg, October 2015

For more details see: <http://www.statistiques.public.lu/fr/publications/series/cahiers-economiques/2015/120-cohesion-sociale/index.html>

⁴⁸ See chapters 4.1 "Employment Objective" and 4.4 "Education Objective".

⁴⁹ 2007: 835 ; 2014: 1.509 ; 2015: 1.520

⁵⁰ 2007: 1.288; 2014: 2.570 ; 2015: 2.573

in 2016, such as the practice workshops, and will be topped off by national financing. The annual budget allocated to SNJ transition measures is estimated at €3 million.

- The social aid law: During 2015, the 30 Social Offices gave out a total of €2.9 million in non-repayable financial aid. The implementation of the law on social aid has helped maintain a good performance level for Luxembourg's material deprivation indicator. The measure will be allocated an annual budget of approximately €17 million, 50% of which is furnished by the State and 50% by the municipalities.
- Social exclusion related to housing and the national strategy to counter homelessness: The government continued its coordination of the implementation of a national strategy to counter homelessness and exclusion linked to housing for the 2013-2020 period. In 2015, the following three priorities were identified: Elements of the study of the phenomena of exclusion related to housing, the inter-ministry collaboration to fight exclusion related to housing amongst young people - via a national structured dialogue focusing on "youth and housing", the procedure for emergency housing for young adults undergoing hardship, an analysis of housing requirements and work on rendering grants for young people consistent in various sectors - and the implementation and support of innovative projects for long-term homeless people through the Housing First projects and the opening of a low threshold day welcome centre.
- Fund for European aid to the most deprived (FEAD): In August 2015, FEAD was launched in Luxembourg to address a hardship situation on the food and essential materials basis. The financing plan for this effort amounts to €3.95 million over seven years and the national co-financing part is €690,000.

5. Use of structural funds

5.1 Coordination with structural funds

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

The themes and programmes for European Territorial Cooperation were hammered out on the basis of the Europe 2020 strategy. With regard to the trans-national and inter-regional projects slated for Luxembourg participation that were approved by the INTERREG A, B and C programmes, the main areas of intervention with relation to the NRP are in R&D and innovation with thirteen projects under FEDER totalling €2.6 million, and Climate Change and Energy areas of climate, environment and transportation, with twenty-two projects garnering total grants of €5.0 million, an amount approved in favour of the Luxembourg partner.

The operational programme of the European Social Fund (ESF) for the 2007-2013 programming period was already a key priority of the European strategy for employment and focused on vulnerable persons such as the young, older persons, women and persons far from the labour market. The financial breakdown amongst the three programme bases, sustainable inclusion in the labour market - 38.4% of the initial envelope; increasing adaptability of employees and companies - 38.4% of the initial envelope; increase in human capital - 19.2% of the initial envelope, was modified in 2011 and upon extension of the programme in 2015. These modifications sought to better align ESF investments with the objectives of the Europe 2020 strategy in application since 2010 with Luxembourg's previous country specific recommendations and with changing requirements in the labour market in Luxembourg. The modifications were especially beneficial to projects targeting young people and people who are very far from the labour market.

5.2 Financing priorities for the period 2014-2020

Under the common strategic framework for 2014-2020 and in accordance with European Commission recommendations, the FEDER Management Authority decided to concentrate its interventions on two priority areas focusing on thematic objectives No. 1 "Strengthening research, technological development and innovation" and No. 4 "Supporting the shift towards a low-carbon economy in all sectors". In addition, it has been decided to use an integrated territorial investment based on themes in the two areas, in compliance with regulations and sustainable urban development concepts. The areas of intervention recommended by Luxembourg are consistent with the European Commission's position and will ensure

continuity with the current programming period, which is already in line with the Europe 2020 strategy. The operational programme "Investment for Growth and Employment" for the period 2014-2020 was adopted by the European Commission on 15 December 2014.

Upon establishing the operational programme for the 2014-2020 period, the ESF management authority focused the priorities and specific objectives more on the Europe 2020 strategy objectives and on the recommendations issued on the date the programme was drawn up. The investment priorities of the operational programme are indeed concentrated on persons who have the greatest need of them. These include young job seekers under 30, including those from immigrant backgrounds, job seekers at least 45 years old, disadvantaged people and employees under 45. The operational programme is made up of three priority areas: support of sustainable professional integration, accounting for 54% of the financial envelope, increase in social inclusion, with 20% of the financial envelope and promoting the acquisition of new skills for another 20% of the financial envelope. In addition, the selection criteria adopted by the ESF follow-up committee also states that the projects introduced for co-financing must also support Luxembourg's efforts to achieve its objectives in the area of employment and social inclusion set out in the Europe 2020 strategy.

The three European territorial cooperation programmes for 2014-2020, in which Luxembourg is participating, were approved by the European Commission in 2015 and are currently being carried out. Project tenders are regularly launched and the first projects were approved in 2015. The themes relevant to the Europe 2020 strategy selected for the INTERREG North-West Europe trans-national programme with a FEDER budget of €396 million are the following: Innovation, low carbon emissions and effective use of materials and resources. The themes relevant to the Europe 2020 strategy selected for the INTERREG Europe inter-regional programme with a FEDER budget of €359 million are the following: Strengthening research, technological development and innovation, improving competitiveness of SMEs, supporting the shift towards a low-carbon economy in all sectors, protecting the environment and promoting the rational use of resources.

The INTERREG Greater Region cross-border cooperation programme, which received allocations of around €140 million by the FEDER fund, set out the following priority areas linked to the Europe 2020 strategy: increase employability and facilitate access to cross-border employment, ensure environment-friendly development and a quality lifestyle, improve living conditions and bolster the competitiveness and attractiveness of the Greater Region.

6. Institutional issues and the role of stakeholders

6.1 Coordination of the distribution of spatial resources

In order to promote better use of resources and to reduce greenhouse gas emissions, it is appropriate to coordinate the distribution of spatial resources and their functions with impacts on primary resources, as well as to optimize the relationships between the various spatial functions. The instruments for this are the four sector plans for housing, transportation, large rural spaces and commercial zones, being drawn up, the reconversion projects in Belval-Ouest and Mersch, as well as the State-Municipality cooperatives that target an equitable and simultaneous assimilation of essential requirements to development of cities and urban areas, through cooperation between the State, local actors, inhabitants and economic players and through a multi-sector approach.

The sector plans went into the adoption procedure at the end of July 2014 in the form of Grand-ducal regulations projects pursuant to the law dated 30 July 2013 for territorial development. In November 2014, the government decided to withdraw the draft Grand-ducal regulations from the procedure phase making sector plans mandatory, which had been intended to provide regulatory tools for territorial planning. This decision was made inevitable after various legal concerns were raised by the State Council. This interruption of the regulatory procedure during which the law on territorial development will be amended will be used to rework the drafts calmly, transparently and in legal certainty while taking into consideration the numerous remarks and suggests submitted by the communes during the public consultation phase.

At present, it may be observed that the economic crisis has hardly diminished pressure on housing, creating new jobs, mobility infrastructure and more generally, land. Luxembourg appears to be growing rapidly but without any significant safety mechanisms in the area of territorial development.

In as much as the land development policy of the government is conditioned by prior social-political choices and that it is largely dependent on the various public agencies, a debate was held in Parliament in March 2015 to engage in a broader debate about the possibilities of promoting economic development on sustainable pathways and appropriate with limited territorial resources. The conclusions emerging from the *Lëtzebuerg zesummen enwécklen* (How to carry out sustainable spatial development?) round table discussions held in June 2015 were presented in February 2016. During this round table event, vital forces, urban planners and architects, as well as syndicates and professional chambers focused on the subjects of mobilising land for residential building, regulatory tools, the master development plan for the territory, financial incentives and the regional approach.

The major challenges facing land development persist and finalising and getting sector plans into the procedure phase remains the first priority.

6.2 National ownership

With a view to increasing transparency and encouraging national ownership, the government closely involved Parliament and the social partners in the European Semester programme for 2016:

- Parliament was involved in the European Semester week that took place at the end of April, 2016 focusing on the government's statement concerning the economic, social and financial situation of the country, prior to submitting the NRP and SGP documents to the European Commission.
- the social partners were again involved as part of the nationwide social dialogue that took place under the aegis of the Economic and Social Council (ESC). In January 2016, an initial meeting inaugurated the new annual consultations⁵¹ cycle and during the second meeting⁵² discussions focused on the major messages to be drawn from the 2016 country report published at the end of February by the European Commission as well as the major priorities of the new NRP and SGP. Additional meetings are planned for 2016 following the May publication of the European Commission's new 2016-2017 proposals for country specific recommendations.

6.3 Communication

Diverse studies have shown that the resistance 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 as part of the Lisbon strategy had a tendency of not taking adequate account of the specific circumstances surrounding Luxembourg, and diverse key indicators of the Europe 2020 strategy still pose a problem. The Tripartite Coordination Committee considered that it would be opportune to publish a national "Competitiveness scoreboard" on an annual basis. The latest version of this publication in October 2015 provides a detailed update of Luxembourg's position relative to the other EU Member countries⁵³. After ten years of use, it was clear that an updating of this national control panel was in order. Over the years, several indicators have lost their relevance and others have been replaced by new indicators of better statistical quality or could not be updated. Discussions are currently underway in the ESC between the social partners with regard to revising this national scoreboard.

⁵¹ For more details see: <http://www.ces.public.lu/fr/actualites/2016/01/sem-europ-1/index.html>

⁵² For more details see: <http://www.ces.public.lu/fr/actualites/2016/03/2e-reunion-semestre-europeen/index.html>

⁵³ MINISTRY OF THE ECONOMY, *2015 Competitiveness Report*, Perspectives de politique économique n°30, Luxembourg, October 2015. For more details see: <http://www.odc.public.lu/>



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Luxembourg, April 2016