



Energy Efficiency Policies and Measures in Luxembourg

ODYSSEE- MURE 2010

Monitoring of EU and national energy efficiency targets

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1 Executive Summary

Looking at the development of energy efficiency in Luxembourg is different from the situation in other European countries. Two main factors influence the national situation to an extent that an assessment of the development on the basis of indicators is connected to some challenges.

First of all the size of Luxembourg is the second smallest country of the European Union with only half a Million inhabitants and a rather small economy. Nevertheless the economic performance of Luxembourg is far above the EU average; despite its small size Luxembourg has a GDP larger than the Baltic States, Slovenia and Bulgaria. Also the dynamic of growth cannot be compared to the situation in the (larger) neighbouring countries. Nevertheless, some industrial sectors only consist of a handful or even a single enterprise, which makes statistics for these sectors nearly impossible. Also the data availability for such a small country is not comparable to the one in other countries.

Secondly, the location of Luxembourg in the heart of Europe results in an extraordinary role of the country in the European transport sector. Internal traffic is not the predominant source of energy demand, but the transit traffic and tanking tourism dominate this sector.

Driven by these effects, since the year 2000 the overall energy efficiency is mainly driven by the transport sector and within this sector external effects are dominating. The main driver is the transit traffic, which far more than 50 percent of the overall energy consumption in Luxembourg. The effect of relative energy prices compared to the neighbour countries is a major driver for this development.

The Luxembourgian industry is dominated by iron and steel industry in terms of energy consumption. Within the last few years, there has been a decrease in energy efficiency of this industry due to structural changes, which lead to decreased overall production and therefore decreased efficiency. For the other branches no clear trend can be derived. Due to the small number of enterprises in Luxembourg (e.g. there are only 21 enterprises active in the chemical industry (one of the largest industrial sectors!) in 2008), structural and production-related aspects are more influential to annual efficiency indicators than mid-term trends.

Since 2000 energy demand for the household sector has decreased significantly. The decrease is mainly driven by the large number of newly built efficient buildings due to the population increase.

2 Key messages

Luxembourg's energy efficiency policy focussed on the building stock and die industry within the last years with rather large effects, also driven by the countries special situation.

The large share of newly constructed buildings in the residential and tertiary sector has led to a massive modernization of the building stock according to the implemented building regulations. This led to an increase in efficiency, which could help to limit the growth of energy demand due to the increased activity.

On the other hand, industry saw massive structural changes within the sectors, especially evident in the electrification of the steelmaking process. Due to the ongoing construction activities, glass and cement production are still major industries. Besides the chemical industry is a larger part of the Luxembourgian industrial landscape. All these industries are situated in early steps of production with few core processes which have been optimized over the last decades intensively. Potentials for cross cutting issues within these industries are lower compared to manufacturing sectors. Still, the voluntary agreements with the industry have proven successful in delivering savings within these sectors.

3 The Background to Energy Efficiency

3.1 Overall economic context

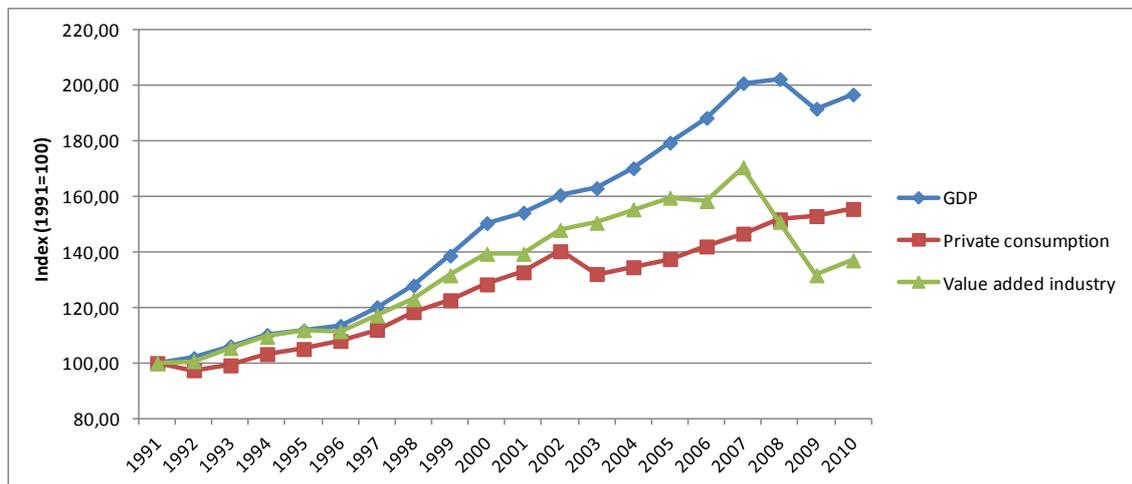
Luxembourg had a highly dynamic economic development over the last 20 years mainly driven by the tertiary sector but also by industry. This resulted in an increase of the residential population of over 20 percent within this period. This development drove private consumption to a rather high level.

The effect of the economic crisis in Luxembourg’s industry was quite strong, as it the industry is mainly active in earlier steps of the production chain (iron & steel, glass, chemistry), which were strongly affected by the effects of the crisis. Throughout the dominance of the tertiary sector within the GDP the effect on the overall GDP was not as strong and in 2010 the pre-crisis level has nearly been reached again.

Table 3-1: Real growth of GDP, private consumption and industry value added in Luxembourg since 1991 (in %/year)

	2008-2010	1991-2010	1991-2000	2000-2008
GDP	-1,4%	3,6%	4,6%	3,4%
Private consumption	1,2%	2,4%	2,8%	1,9%
Value added industry	-4,7%	1,7%	3,8%	0,9%

Figure 3-1: Macro-economic development in Luxembourg, 1991-2010

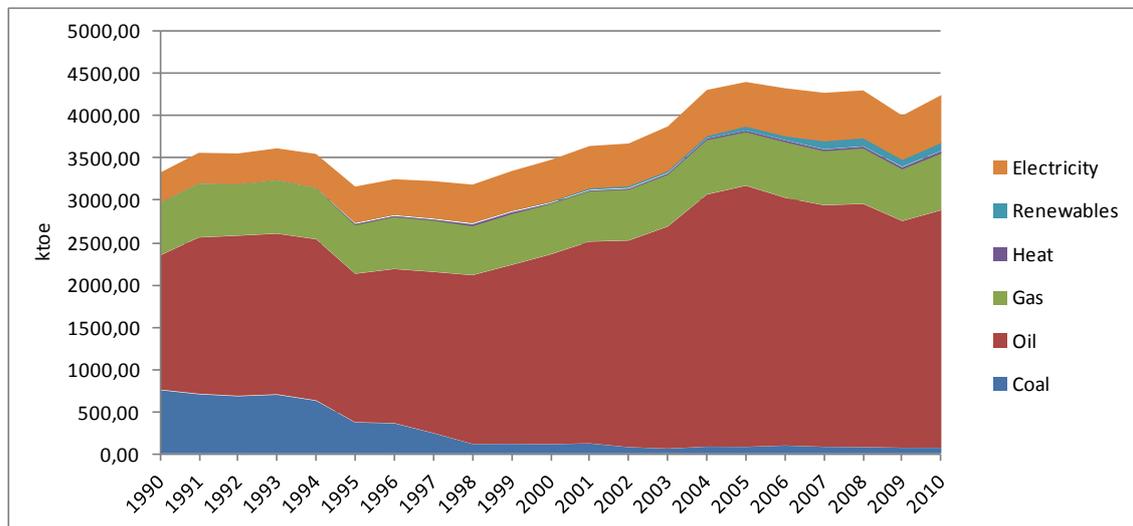


3.2 Energy consumption trends : by fuel and by sector

Despite the strong economic development, the overall energy consumption has not been developing that strong. The overall numbers show a distorted picture of the actual situation due to the special circumstances of a small country like Luxembourg. Figure 3-3 clearly shows the dominance of the Transport sector in the energy demand of Luxembourg. It contributes to more than 70 percent of the overall energy demand. This tremendous share is not caused by an extraordinary mobility of Luxembourgian residents, but has its origins in the transit traffic and tanking tourism of nearby foreigners. According to the national statistics more than 70 percent of the energy demand of the transport sector. Therefore more than 50 percent of the country's energy demand is generated by transit traffic and tanking tourism.

Therefore oil is the dominating energy carrier in the energy balance, followed by a large margin by natural gas and electricity with comparable shares. The role of renewables and district heating is still rather small but developing. Coal is no more significant after the structural change in the iron and steel industry within the nineties from blast to electric arc furnaces.

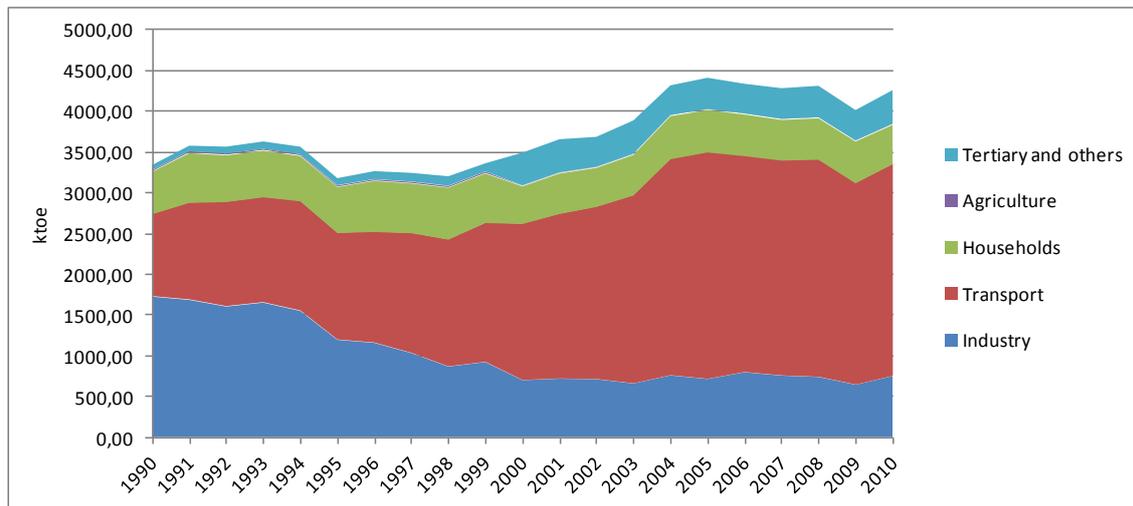
Figure 3-2: Final energy consumption (excl. non-energy consumption) by energy carrier in Luxembourg, 1990-2010



The final energy consumption of the industry has significantly declined over the last 20 years, mainly driven by the structural changes mentioned before. Since the millennium the energy demand is rather constant compared to a strong economic development, which means a decoupling of energy demand and production has been successful. Within households and the tertiary Sector the development is similar. The overall con-

sumption is more or less constant compared to a dynamic growth. The discontinuity in the year 2000 within these two sectors does result from statistical effects.

Figure 3-3: Final energy consumption (excluding non-energy consumption) by sector in Luxembourg, 1990-2010



3.3 The policy background to energy efficiency

Length: 2-3 pages

Provide short descriptions on main changes in the recent past 1-2 years: institutional changes, general energy –efficiency /CO₂ /RES strategies, ...

Between 1991 and 2007, energy consumption in the household sector (not climate-corrected) fell from 57 to 53 Mtoe, i.e. by about 7 % (). The decrease was caused by a strong decline in fossil fuels/heat consumption (-12 % since 1991). Electricity consumption however continued to rise significantly (+29 % since 1991). In 2007, the share of electricity in total household energy consumption amounted to 23 %.

The average unit consumption per dwelling showed a non-uniform development, which is dominated by the development for space heating, which is responsible for more than three quarters of total consumption (see). In 2002 a continuous decrease has started both for space heating and total unit consumption per dwelling. Electricity consumption per dwelling only slightly changed over the whole period. The non-uniform development of unit consumption per dwelling is due to the fact that it is influenced by several determinants, which partly compensate each other: fuel substitution, higher energy efficiencies due to thermal regulations, changes in dwelling size or heating system (trend

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to central heating), changes in the share of single and multi-family dwellings and not least behavioural factors as e. g. a trend to higher indoor temperature or a more intensive use of electrical appliances or lamps.

4 Overall Assessment of Energy Efficiency Trends

4.1 Overall trends in energy intensity

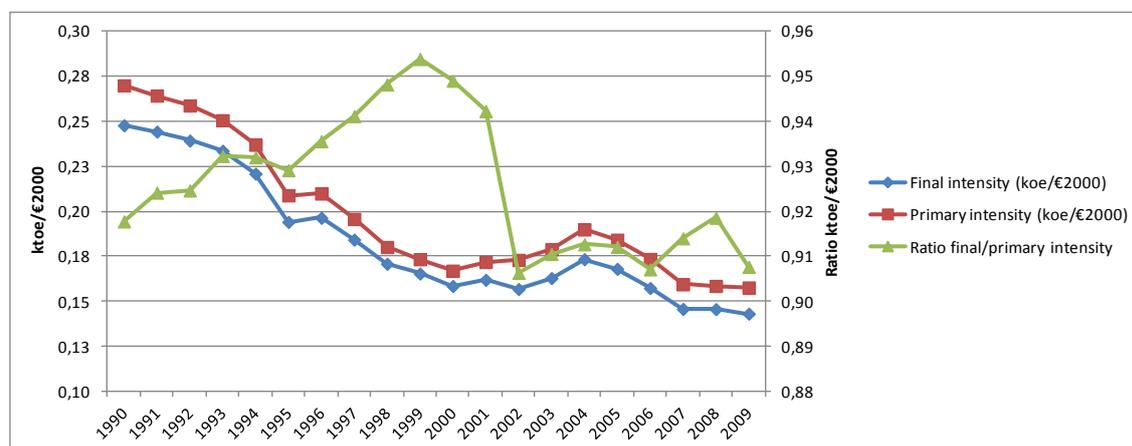
The overall trend of final and primary energy intensity is a clear decline between the years 1990 and 2009. From the year 2000 a slight increase can be observed, but the general development continues from 2004 on. An interesting observation is the change of Final/Primary intensity in 2002, which is caused by the start of the operation of the large electricity plant in Luxembourg. The years before saw the installation of some CHP-plants, which contribute to the same effect. By the increase of national electricity generation capacity, the energy transformation is part of the national inventory and thus decreases the final/primary ratio.

In contrast, the years before 1999 were accompanied by a constant decline in domestic electricity generation, resulting in an increased final/primary ratio.

Table 4-1: Variations in final and primary energy intensity in Luxembourg (in %/year)

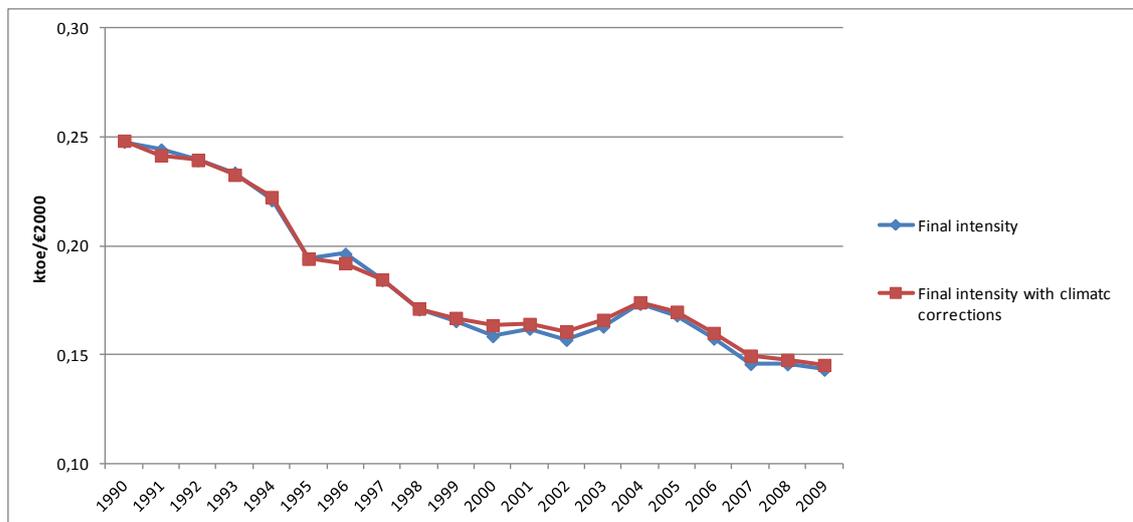
	2007-2009	1990-2009	1990-1998	1998-2007
Final intensity	-0,9%	-2,8%	-4,5%	-1,8%
Primary intensity	-0,6%	-2,8%	-4,9%	-1,3%

Figure 4-1: Primary and final energy intensity in Luxembourg 1990 to 2009



The climatic corrections do not influence the final energy intensity significantly.

Figure 4-2: Final energy intensity in Luxembourg and the role of climatic variations, 1990-2009

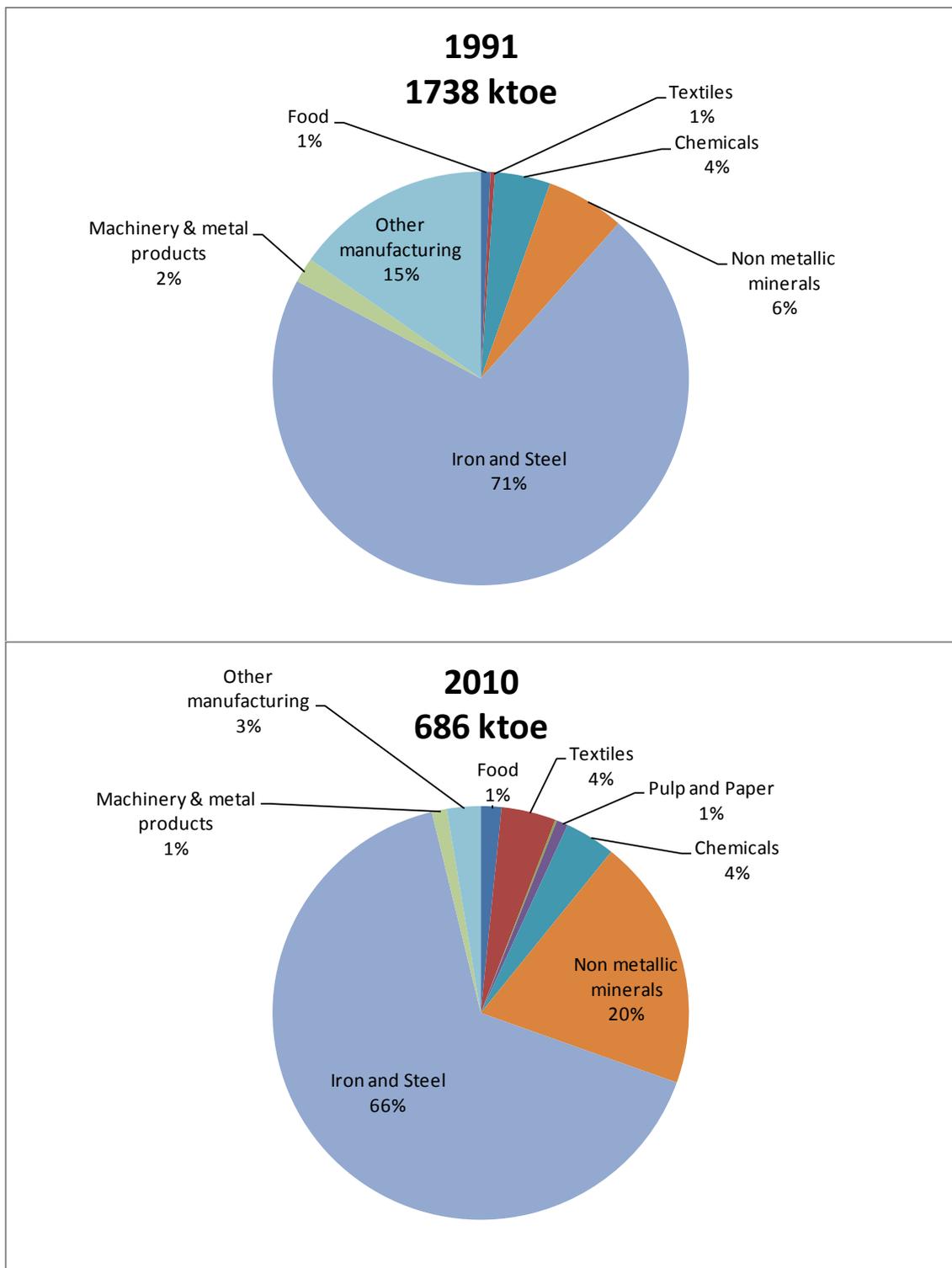


4.2 Industry

The structural change of the industry is the major driver of the development of the energy demand. A massive decline of the total consumption within the industry is accompanied by a structural change. The total volume of non-metallic minerals is rather constant, whereas its share has risen due to the overall decline. The iron and steel industry has a significantly lower consumption in 2010 compared to 1990, the volume of steel production also declined over time at a slower rate, so energy intensity of steel production has declined effectively. The main driver for this development was the structural change in steel production, which significantly reduced the unit consumption of steel production.

The manufacturing industry is no more present in the 2010 statistics due to statistical methodology.

Figure 4-3: Energy consumption in the industrial sector by branches, 1991 & 2010



Energy Efficiency Policies and Measures in Luxembourg in 2012

Figure 4-4: Energy intensity within manufacturing industry 1991-2008

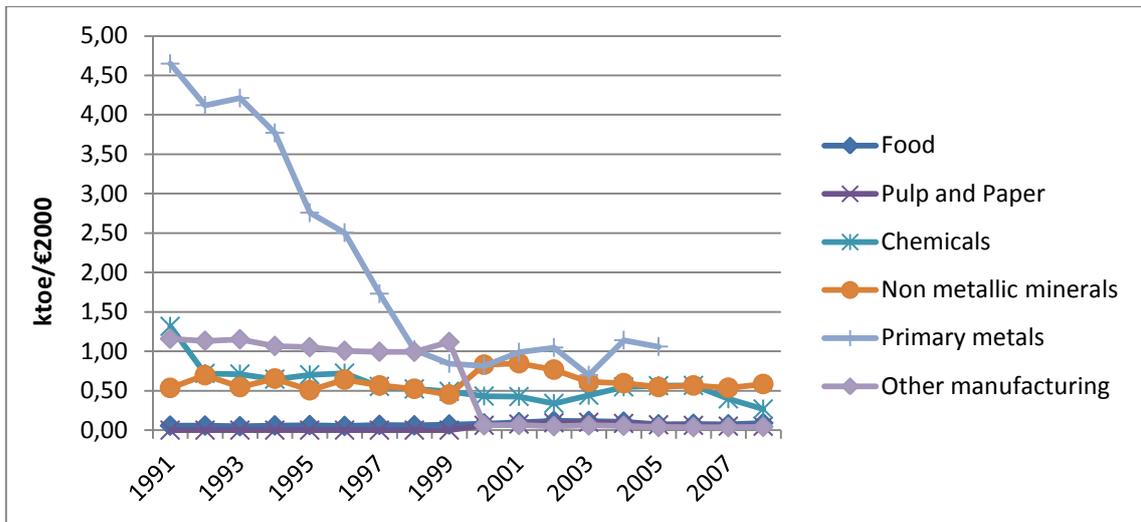


Figure 4-5: Unit consumption of selected energy intensive products 1991-2009

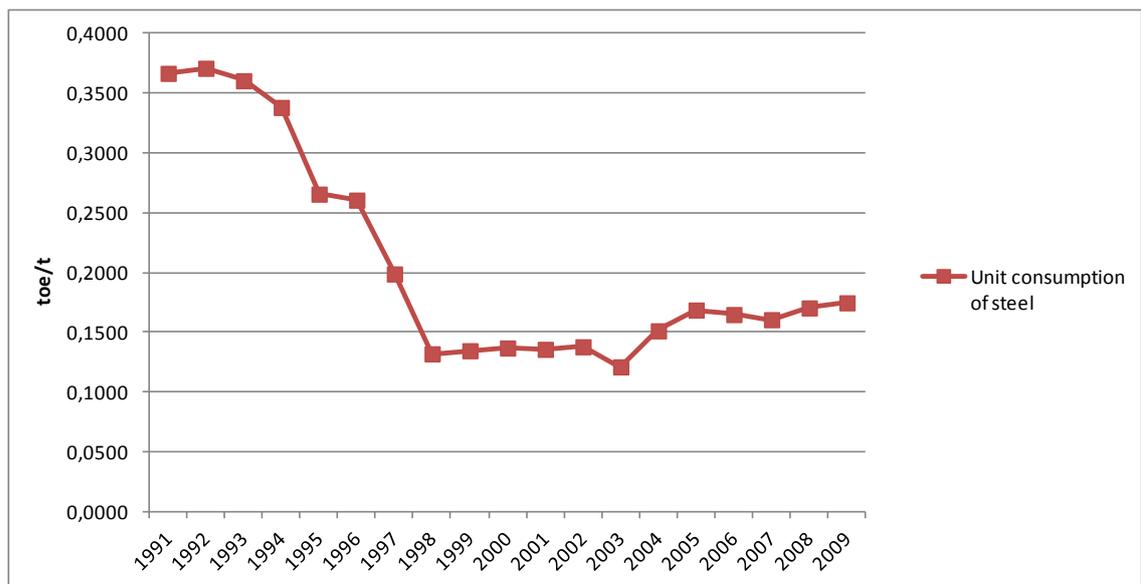
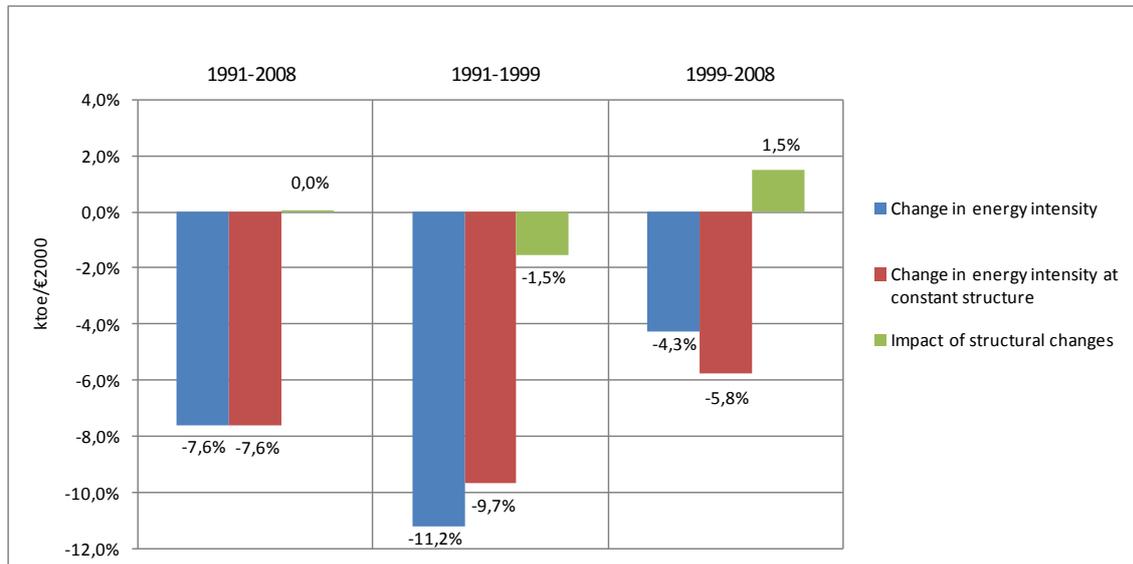
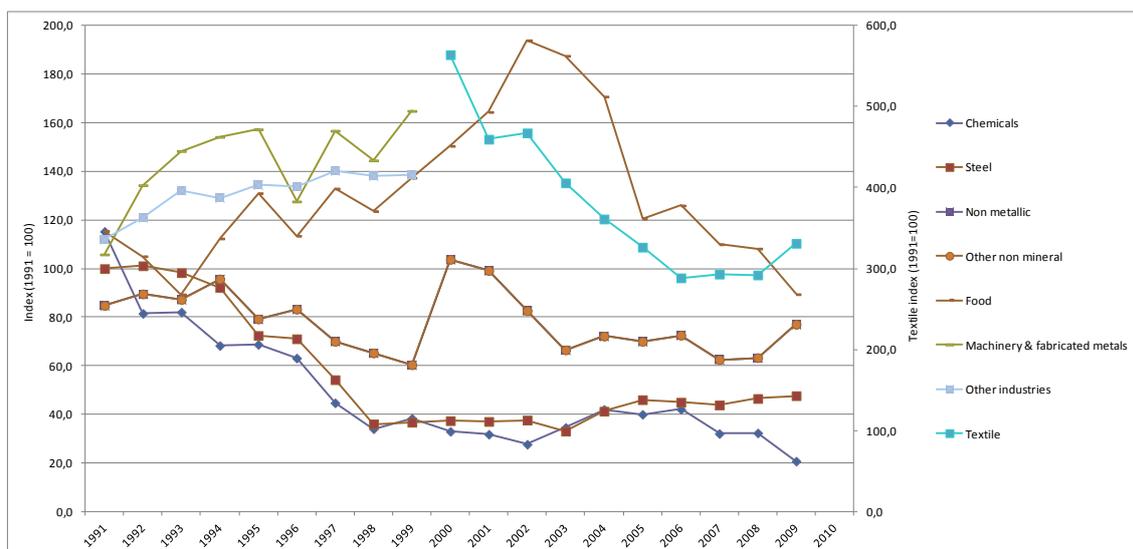


Figure 4-6: Energy efficiency and structural change effects in manufacturing industry, 1991-2008



The general picture of energy efficiency trends in Luxembourg is heterogeneous over the different branches. This is however caused by the special situation with branches consisting of only one or two major enterprises. Production issues within these enterprises dominate the energy demand development, so indicative trends cannot be derived properly from these indicators.

Figure 4-7: Energy efficiency trends in manufacturing 1991-2010



4.3 Households

The overall energy consumption in households has developed quite in parallel to the increase of population since 2000. No significant development of unit consumption for space heating and electricity can be observed until 2007. Since then, the unit consumption has decreased significantly, also resulting in a decrease of overall consumption.

Figure 4-8: Fuel and electricity consumption in households, 1990-2009

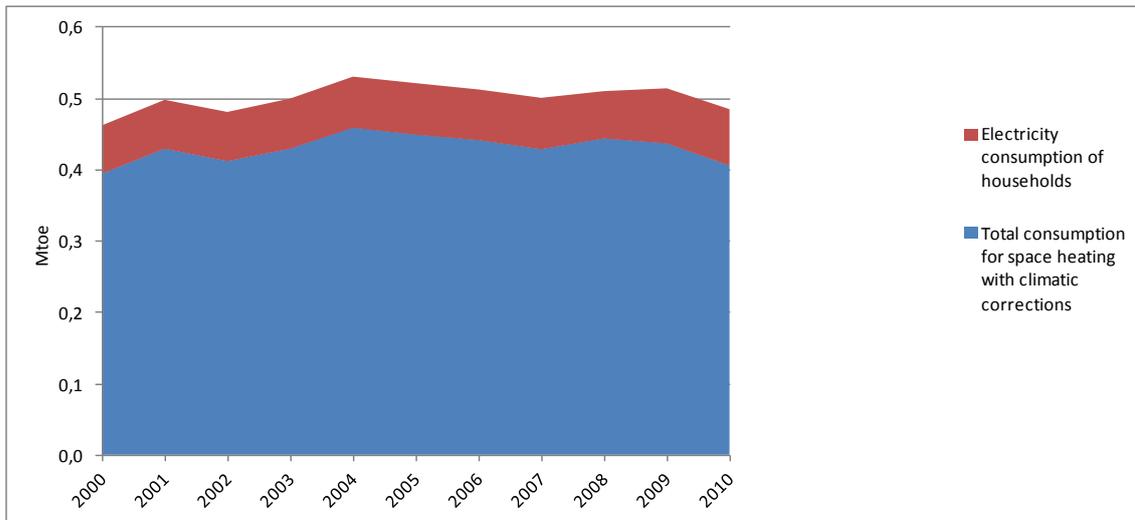
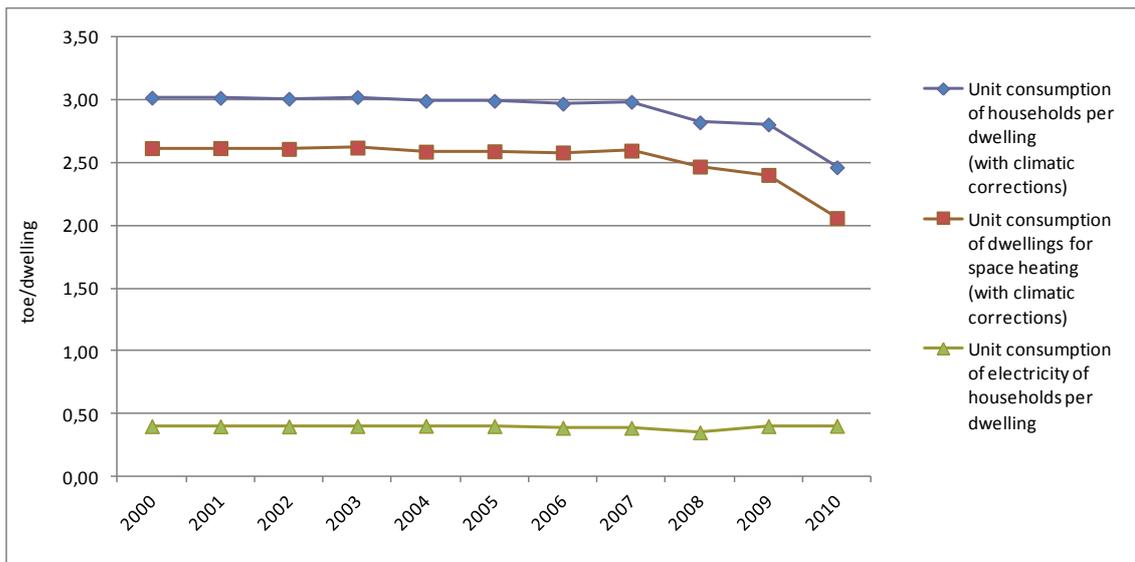
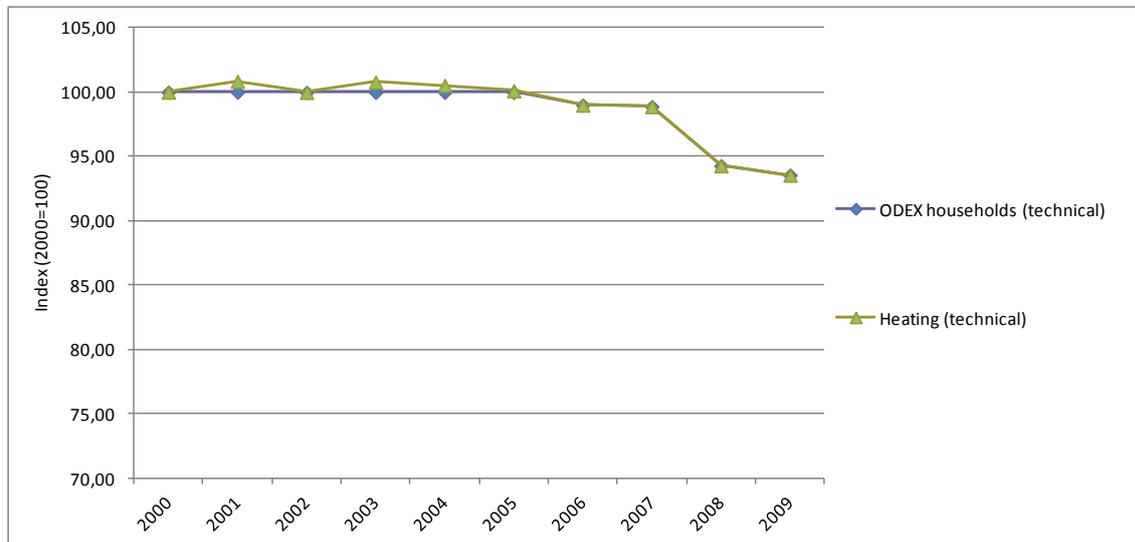


Figure 4-9: Unit consumption of households in toe/dwelling (total and space heating climate corrected), 1990-2009



The energy efficiency trend described by the ODEX supports the trends described above with a constant development until 2007 and an increase afterwards.

Figure 4-10: Energy efficiency trends in the household sector 1991-2009



4.4 Services

The absolute electricity consumption in the service sector is fluctuating rather strongly over time. Nevertheless the overall trend is an increase of electricity consumption. The main driver for this development is the increasing number of employees as the unit consumption decreases slightly over time.

Figure 4-11: Electricity consumption in the service sector, 1990-2010

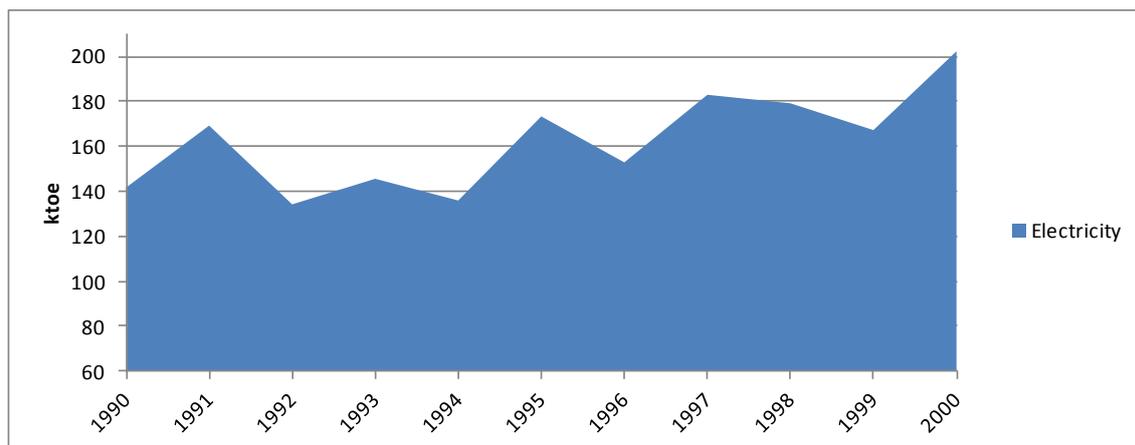
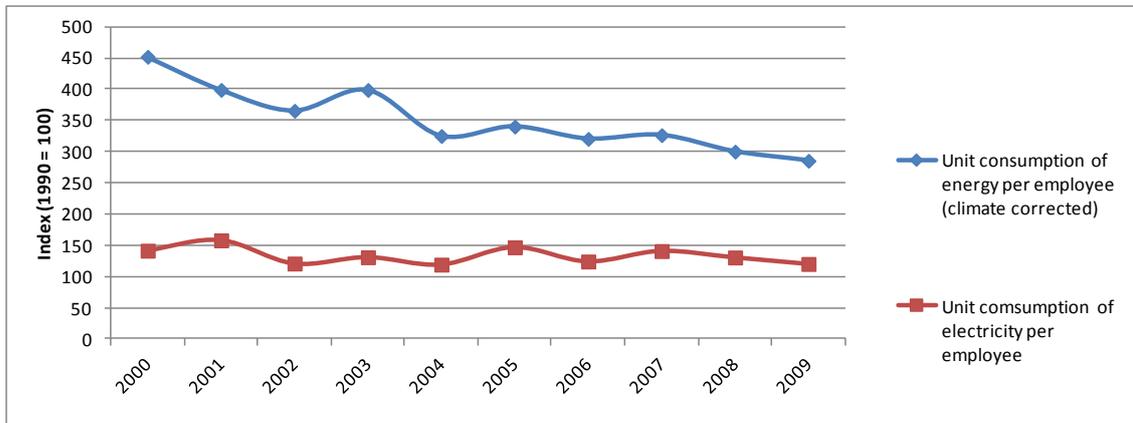


Figure 4-12: Unit Consumption in the service sector (private and public services) , 1990-2009



4.5 Transport

Total transport energy consumption has developed strongly since 1990. The energy consumption in the transport sector is dominated by the road traffic mode, which can be clearly seen in the parallel development of total and road consumption. Rail traffic has been rather constant at a very low overall level. In contrast, air traffic has developed even more rapidly than the road traffic resulting in a more than tripled energy demand compared to 1990.

Figure 4-13: Development of transport energy consumption by mode 1991-2010

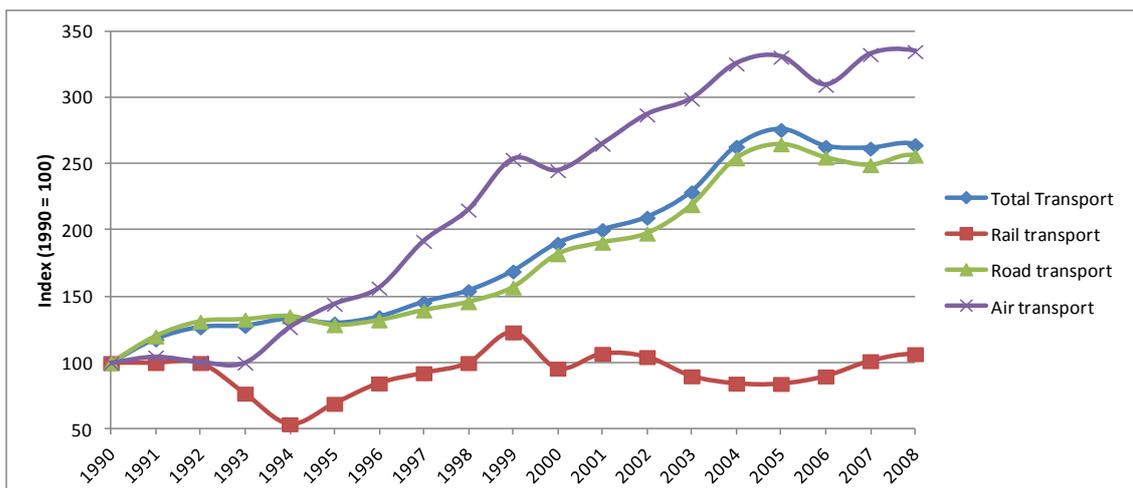
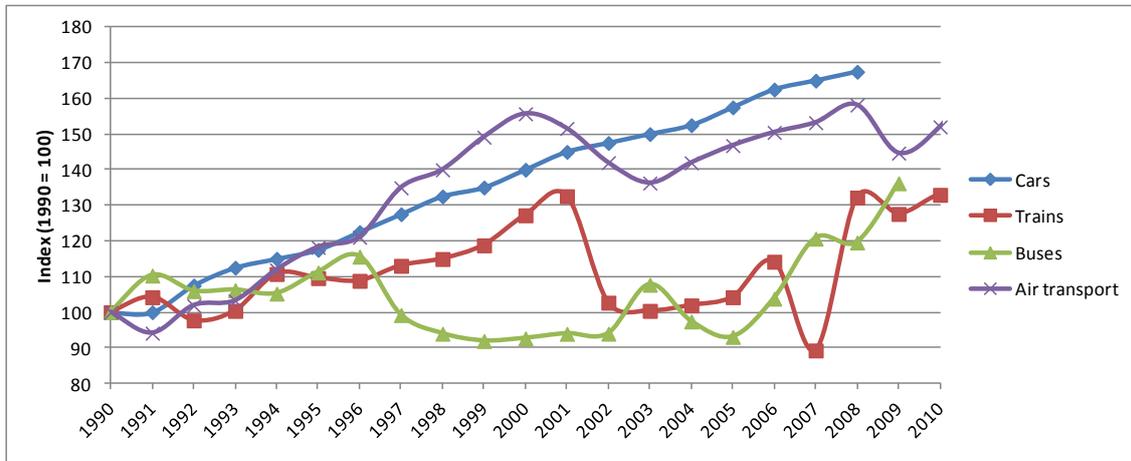
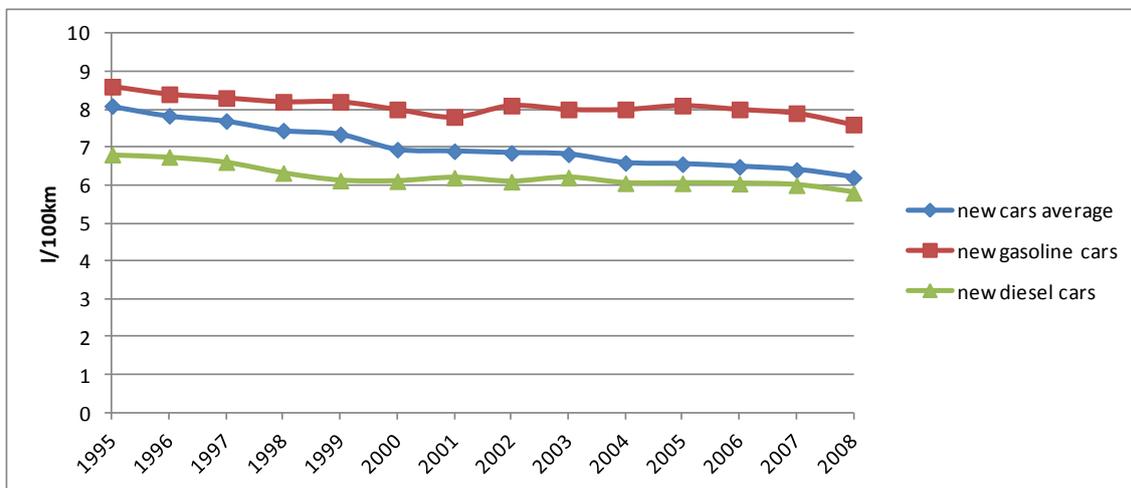


Figure 4-14: Passenger traffic by means of transportation, 1991-2010



The specific consumption of new cars has also declined since 1995. The main driver for the improvement of the average consumption of all new cars was thereby not only driven by the development of diesel and gasoline cars, but mainly by the shift between the two carburant types. Most cars actually sold are diesel cars, so the average of all new cars approximates this value.

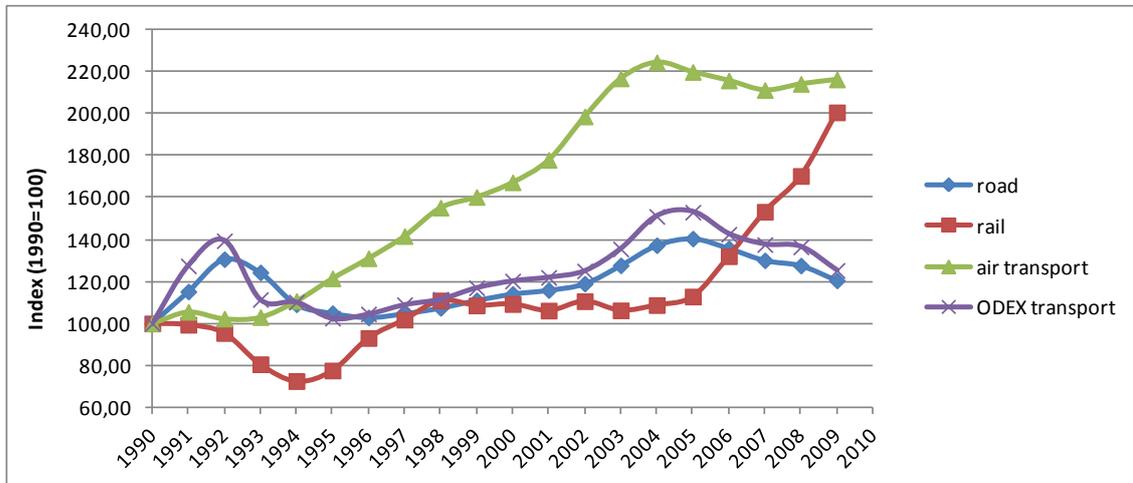
Figure 4-15: Specific fuel consumption of cars (new cars), 1995-2008



Energy efficiency indicators in transport have to be interpreted with care in the special case of Luxembourg. For the air transport, the odex does not consider freight traffic, which has increased by the factor four since 1990 and is predominant in Luxembourg's air traffic.

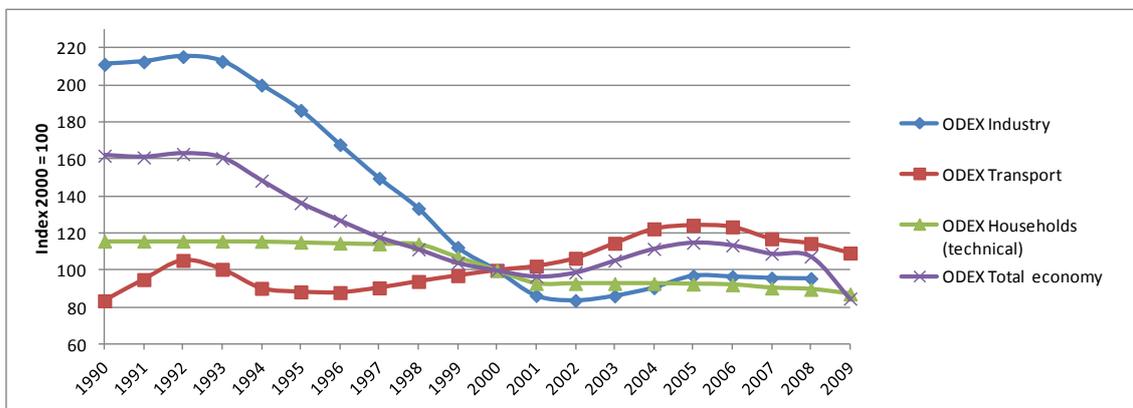
Concerning road transport, the effect of transit traffic and tanking tourism distorts the picture drawn by the indicator. Actually since 2005 the energy consumption by non-residents has decreased, driving the ODEX downwards.

Figure 4-16: Energy efficiency progress in the transport sector, 1991-2010



4.6 Assessment of energy efficiency/savings through ODEX: total and by sector

Figure 4-17: ODEX figures for Luxembourg, 1990-2009



4.7 CO₂-emissions trends

CO₂ Emissions are dominated by the transport sector due to the drivers mentioned above. The results from industry are of larger interest, as the direct emissions from industry have decreased by more than 70 percent over the last 20 years. This can be explained easily by the increased electrification of the industrial sector with the main remaining direct emitter being the cement industry.

Figure 4-18: Cumulated CO₂ emissions by sector, 1990-2008

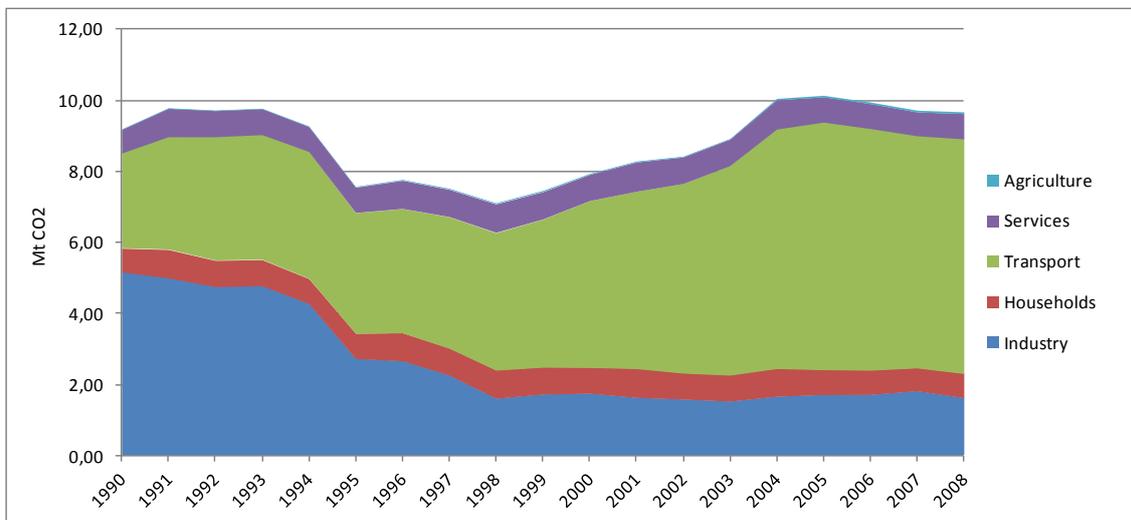
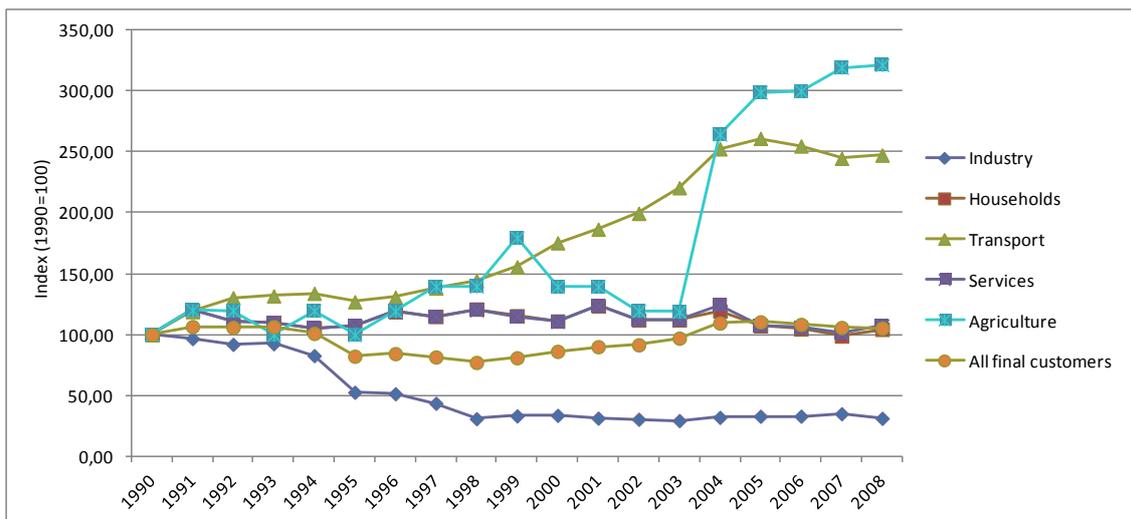


Figure 4-19: CO₂ emissions by sector (direct emission), 1990-2008



5 Energy efficiency measures

The following analysis of energy efficiency policies and measures in Luxembourg is based on the MURE database for energy-efficiency measures available on the internet (www.muredatabase.org). The database provides comprehensive, up-to-date information on energy-efficiency policies in the four demand sectors (households, transport, industry, tertiary) and on policy measures across the sectors in the EU-27 countries, Norway, Croatia and for the EU itself. The measures can be retrieved according to various criteria (e. g. type of measure, enforcement year, target audience, technologies affected, impact evaluation etc.). Summary tables and graphs by different criteria can also be created by the user of the MURE database. Recently, two new features have been added to the MURE database in order to better reflect the strong connections between national and European energy efficiency policies:

- If a measure is included in the National Energy Efficiency Action Plan under the EU Energy Efficiency and Service Directive ESD (2006/32/EC), it is classified as “NEEAP measure” in the MURE database. This allows an easy identification of policy measures reported in the NEEAPs and a specific analysis of these policies.
- In order to separate of EU-wide measures which are common to all EU Member States (mainly EU Directives) from pure national measures, a set of “EU measures” was also defined in the MURE database.

The description of the energy efficiency policies at the national level in MURE is provided by national energy agencies or institutes¹ according to harmonised guidelines (Schlomann & Eichhammer 2011). An overview of all policy measures which are included in the MURE database for Luxembourg is given in Annex 1.

5.1 Recent Energy Efficiency Measures

Residential Sector

The main focus of the measures in the residential sector within the last years was the improvement of the building stock. Besides the constant development of the building directives towards a more and more ambitious energetic performance of buildings financial incentives have been set in place to foster energy efficient construction.

¹ The national partner for Germany is the Fraunhofer Institute for Systems and Innovation Research (Fraunhofer ISI) in Karlsruhe, Germany (www.isi.fraunhofer.de).

The strongest instrument in terms of impact is the **2008 Energy Efficiency Ordinance (WD 2008)** especially for the renovation of old buildings followed by the **2011 Energy Efficiency Ordinance (WD 2011)**, which tightened the regulation even further.

For tightened regulations do not foster an increased renovation rate or further quality of renovation compared to the requirements accompanying measures financial incentives have been put in place, namely **the Building upgrading programme for old buildings** and the **Promotion programme for energy efficient new buildings** have been started in 2008.

Such measures that stimulate a quicker penetration of efficiency measures in the existing building stock through financial incentives can be very effective. This applies in particular to improvement programmes that support the introduction of tighter threshold values for the energy efficiency of buildings. Their quantified impact is rather low compared to the building regulation.

Transport Sector

Transit traffic, which dominates the transport sector, is not directly part of Luxembourg's efficiency policy measures. Nevertheless the Kyoto Cent, which is aimed at a reduction of domestic fuel consumption, however, also has a considerable impact on transit traffic and tanking tourism.

Fuel price adaptation through the introduction of the Kyoto Cent, however, also leads to a reduction of fuel consumption in domestic traffic.

Furthermore there are two measures aimed at increasing the share of vehicles with low CO₂ emissions (**Introduction of a CO₂-dependent motor vehicle tax** and **Promotion of low CO₂ emissions vehicles**). Through the relevant reduction in consumption of the domestic vehicle stock efficiency gains in the transport sector are achieved.

Industrial Sector

Industry in Luxembourg has committed to savings in a self-regulatory regime since the mid 1990s, which should contribute to the full utilisation of the large saving potentials among cross-cutting technologies.

By the voluntary agreement the participating companies have to save energy by improving the energy efficiency of their production installations and processes. All the major Luxembourg companies have signed up to the agreement.

The objective of the first agreement, signed in March 1996, was to improve the energy efficiency of the industry by 10% by the end of 2000, taking 1990 as the reference year. This first voluntary agreement expired at the end of 2000; a new voluntary agreement, signed in April 2002, covered 2000-06. In May 2005 that agreement was amended: penalties relating to the objectives were added. Under the agreement some 80 companies undertook to guarantee a minimum level of energy management and to make progress towards a more rational use of energy by together improving their efficiency by an average of 1% per year compared to 1990. In addition, the 'major users', exceeding a consumption of 500 000 GJ per year, committed to performing energy audits in order to identify objectively their potential for saving.

The voluntary agreement underwent further minor amendments and was renewed twice: firstly at the beginning of 2007 with an expiry date of 31 December 2008, and secondly at the end of 2008 with an expiry date of 31 December 2010.

The signatories set a target of improving energy efficiency by 20%, measured by the general efficiency index over the period 1990-2010 for the companies which signed up to the agreement.

Tertiary Sector

In the tertiary sector the situation is quite comparable to the residential sector with a high importance of the building stock quality. Therefore the building regulations play an equally important role here with the WD2008 (which covered both, residential and non-residential buildings) which was followed by a regulation specifically put in place for non-residential buildings in 2010.

Cross-cutting measures

With respect with decentralised renewables (particularly solar thermal collectors) and combined heat and power (CHP), important efforts were undertaken in order to reduce the use of fossil energy sources through improved energy efficiency. Several **promotional programmes** have been in place to promote these technologies.

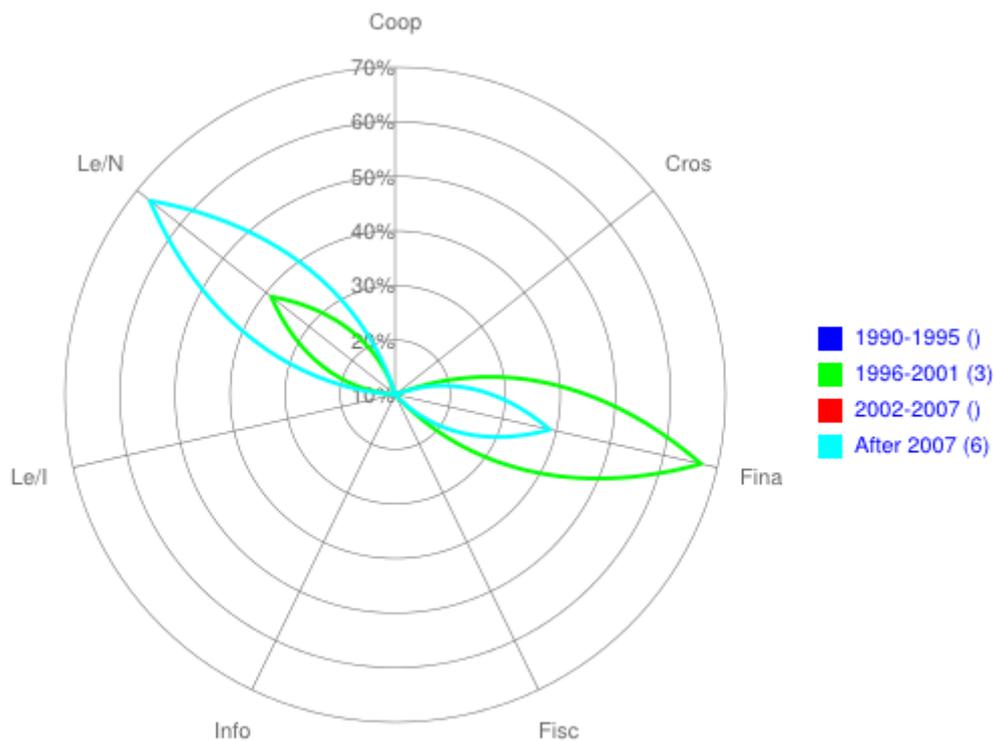
5.2 Patterns and Dynamics of Energy Efficiency Measures

The building stock is a main point of attention in Luxembourg's energy efficiency policies due to the strong dynamic of population growth. A majority of measures aims at the energetic improvement of the building stock in the residential sector as well as in the tertiary sector. The impact assessment shows a large impact of these measures

Residential Sector

The pattern for the residential sector shows the focus of measures in Luxembourg. The main policies focus on financial and legislative normative measures. The number of legislative-normative measures has increased over time reflecting the success of these instruments especially in the context of the rapid demand for newly constructed buildings.

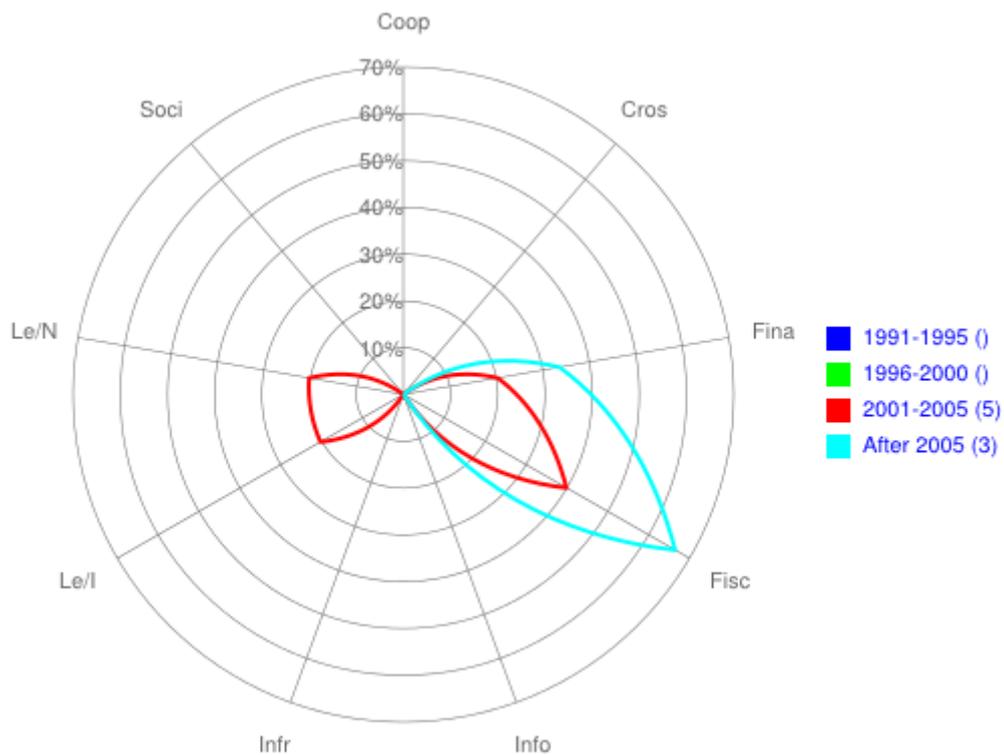
Figure 5-1 Patterns of policies and measures in Luxembourg after 1990 – Household



Transport Sector

Within the transport sector the focus is clearly on fiscal and financial instruments, after 2005 no new legislative instruments have been put into action. The actual number of fiscal and financial instruments has not changed though.

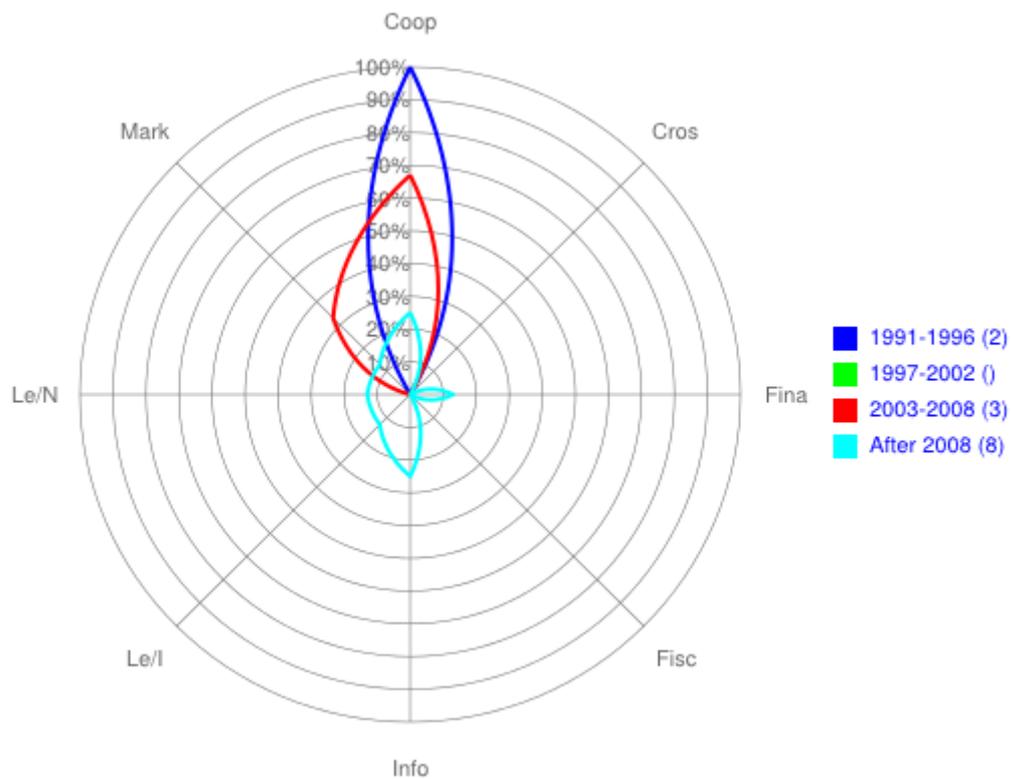
Abbildung 5-2 Patterns of policies and measures in Luxembourg after 1990 – Transport



Industrial Sector

Whereas before 1996 the only instruments targeting industry were the cooperative voluntary agreements, the type of instruments used in later periods has broadened, including the market oriented ETS targeting the more energy intensive industries as well as legislative/informative instruments with mandatory energy audits for the enterprises. Besides the voluntary agreements are still continued with new signings every few years.

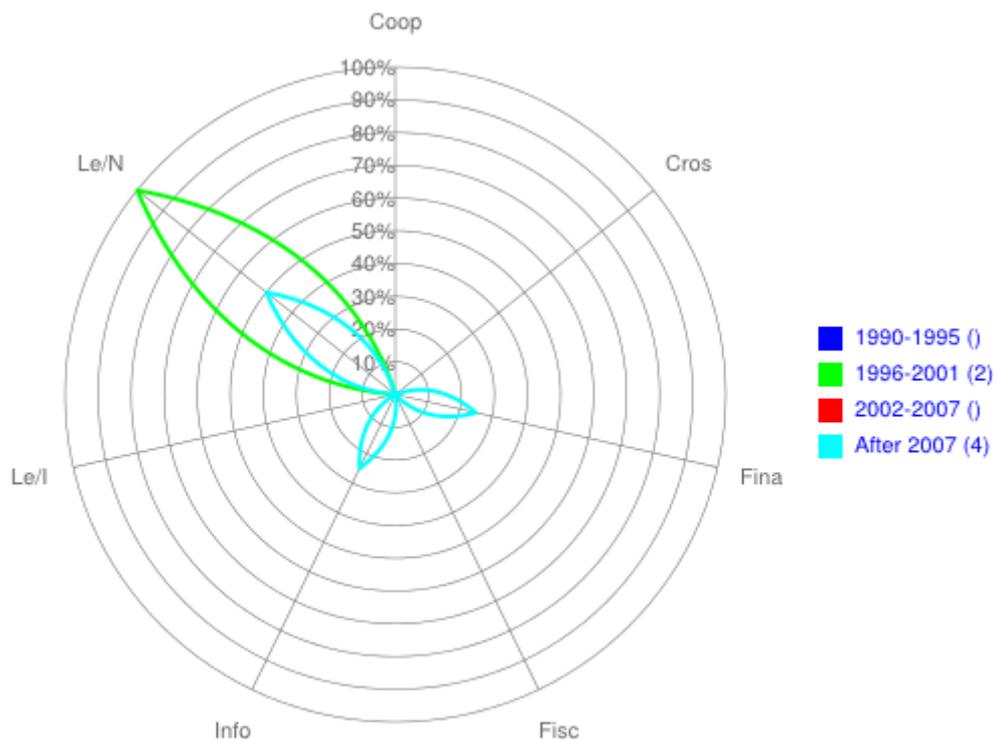
Abbildung 5-3 Patterns of policies and measures in Luxembourg after 1990 – Industry



Tertiary Sector

The tertiary sector has been addressed only by legislative-normative measures targeting the building stock before 2001. This spectrum of measures has been broadened by integrating informative and financial measures also targeting other energy uses like appliances.

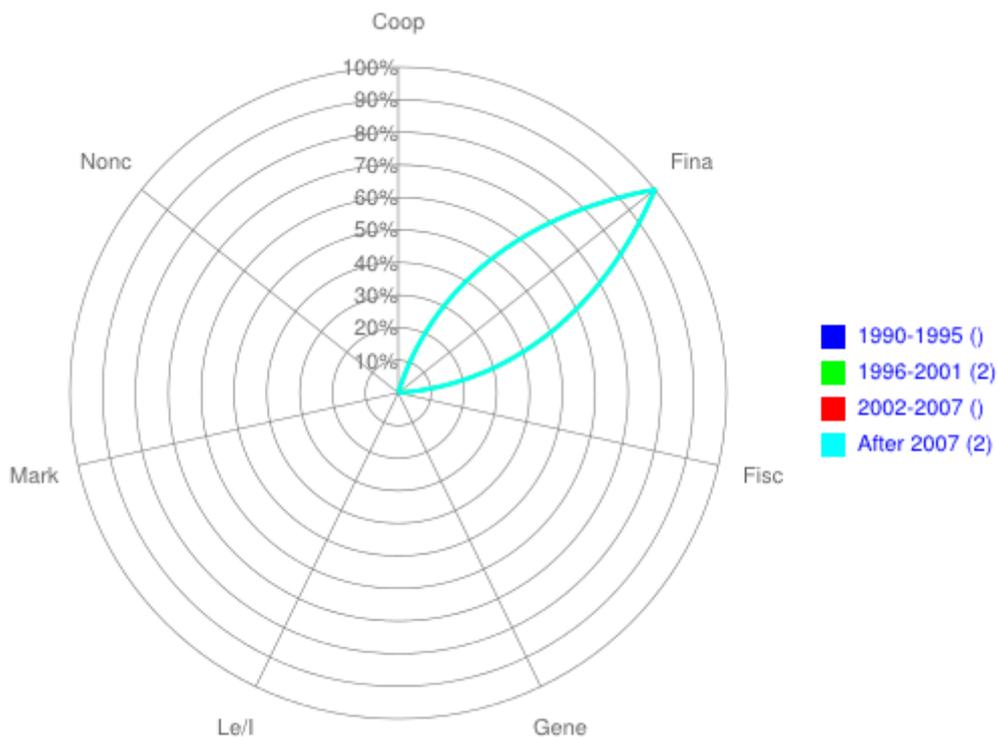
Abbildung 5-4 Patterns of policies and measures in Luxembourg after 1990 – Tertiary



Cross-cutting measures

The cross cutting measures mainly address CHP and RES installation which is supported by financial measures. This has not changed over time, also the number of programmes in place is constant.

Abbildung 5-5 Patterns of policies and measures in Luxembourg after 1990 – Cross-cutting



5.3 Energy efficiency measure evaluations

5.3.1 Semi-quantitative Impact Estimates of Energy Efficiency Measures

The measures with the largest semi quantitative impact according to the MURE database are the building regulations for the residential and the tertiary sector and the voluntary agreements for the industry.

The supporting financial schemes for buildings have a lower quantitative impact. According to the methodology used also for the NEEAP only savings above the actual regulations are allocated to the financial measures; the normative instruments for the baseline for these instruments with most of the savings allocated to them. The impact of the financial instruments on the overcoming of barriers may not be described correctly by this approach, so these instruments with a Medium semi-quantitative impact should not be underestimated in their unquantifiable effects.

6 National Developments under the EU Energy Efficiency Directive and the 20% Energy Efficiency Target of the EU

The second National Energy Efficiency Action Plan (NEEAP) of Luxembourg in accordance with the EU Directive on Energy End-use Efficiency and Energy Services (2006/32/EC) was submitted by the Ministry of Economics in September 2011. The first NEEAP was submitted in September 2007. Both plans cover the full range of measures covered in this report and are a major basis for the quantitative impact assessment within the MURE database.

The reporting within the NEEAPs showed that Luxembourg is on a solid way to achieve the targets set down in the Energy Service Directive, independent of the assessment methodology used for impact assessment.

Annex 1

Energy Efficiency Measure Summary by Country

Energy Efficiency Policies and Measures in Luxembourg in 2012

Table 1: Policy measures in the household sector

Code	Title	Status	Type	Starting Year	Ending Year	Semiquantitative Impact
LUX1	Grants for energy savings investments in private houses	Completed	Financial	--	--	Unknown
LUX2	Control on new fuel fired boilers for heating equipments	Ongoing	Financial	--	--	Unknown
LUX3	Grants for thermovision of private houses	Ongoing	Financial	--	--	Unknown
LUX4	Information campaign	Completed	Information/Education	--	--	Unknown
LUX5	Recommended insulation standards for private houses	Ongoing	Legislative/Normative	--	--	Unknown
LUX6	Grant for renewable energies and new technologies for energy savings	Ongoing	Information/Education	--	--	Unknown
LUX7	New building codes		Legislative/Normative	--	--	Unknown
LUX8	Grant for energy audit of buildings	Ongoing	Financial	--	--	Unknown
LUX9	Programme of energy economy in districts	Ongoing	Financial	--	--	Unknown
LUX10	New building code	Ongoing	Legislative/Normative	--	--	Unknown
LUX21	Improvement in the overall energy efficiency of private dwellings (WD 2012) (new/old buildings)	Unknown	Legislative/Normative	--	--	High

Energy Efficiency Policies and Measures in Luxembourg in 2012

Code	Title	Status	Type	Starting Year	Ending Year	Semiquantitative Impact
LUX22	Renewal of oldest heating systems	Proposed (advanced)	Financial	--	--	Medium
LUX23	Promotion of efficient refrigerators (A++)	Ongoing	Financial	--	--	Unknown
LUX11	EU-related: Energy Performance of Buildings (Directive 2002/91/EC) - Ordinance of the Grand Duchy of 22 November 1995 on the thermal insulation of buildings (dwellings)	Completed	Legislative/Normative	1996	2007	High
LUX12	Promotion of efficient new building/more efficient heating systems (2001-2007)	Completed	Financial	2001	2007	High
LUX13	EU-related: Energy Performance of Buildings (Directive 2002/91/EC) - Improvement in the overall energy efficiency of private dwellings (WD 2008) (new/old buildings)	Ongoing	Legislative/Normative	2008	--	High
LUX14	Old building upgrade programme	Ongoing	Financial	2008	2012	Medium
LUX15	Promotion of energy-efficient new homes (new building compared with WD2008: low-energy housing, passive housing)	Ongoing	Financial	2008	2012	Medium
LUX17	Renewal of oldest heating systems	Ongoing	Financial, Legislative/Normative	2008	--	Medium

Energy Efficiency Policies and Measures in Luxembourg in 2012

Code	Title	Status	Type	Starting Year	Ending Year	Semiquantitative Impact
LUX24	Support of efficiency labelling	Ongoing	Information/Education	2008	--	Unknown
LUX19	EU-related: Ecodesign Directive for Energy-using Products (Directive 2005/32/EC) - Law establishing a framework for setting ecodesign requirements applicable to the EuP	Ongoing	Legislative/Normative	2009	--	Low
LUX16	Expansion of the upgrading programme for old buildings	Unknown	Financial	2010	2012	Medium
LUX18	Increase in promotion of efficient new building (new buildings, as against WD2008)	Unknown	Financial	2010	2012	Medium
LUX20	EU-related: Recast Ecodesign Directive for Energy-related Products (Directive 2009/125/EC) - Law establishing a framework for setting ecodesign requirements for energy related products	Unknown	Legislative/Normative	2010	--	Unknown

Table 2 : Policy measures in the tertiary sector

Code	Title	Status	Type	Starting Year	Ending Year	Semiquantitative Impact
LUX1	Thermal insulation of buildings (tertiary sector)	Completed	Legislative/Normative	1996	2007	High
LUX2	Improvement in the U-values of the non-domestic buildings (WD2008)	Ongoing	Legislative/Normative	2008	--	Medium
LUX3	EU-related: Energy Performance of Buildings (Directive 2002/91/EC) - Expansion of the Ordinance of the Grand Duchy for 2008 on improving the overall energy efficiency of buildings to nondomestic buildings in 2010	Unknown	Legislative/Normative	2010	--	Medium
LUX4	Realising electricity savings potential in the TCS sector	Proposed (advanced)	Financial, Information/ Education/Training	2012	--	Medium

Energy Efficiency Policies and Measures in Luxembourg in 2012

Table 3 Policy measure in industry

Code	Title	Status	Type	Starting Year	Ending Year	Semiquantitative Impact
LUX1	Energy savings grants	Ongoing	Financial	--	--	Unknown
LUX2	Special amortizing	Ongoing	Fiscal/Tariffs	--	--	Unknown
LUX8	Voluntary Agreements from 1996 to 2007	Unknown	Co-operative Measures	1996	2007	High
LUX4	EU-related: EU Emission Trading Scheme (2003/87/EC) - Law of 23 December 2004 establishing a system for trading emissions of greenhouse gases and creating a financing fund of the Kyoto mechanisms	Ongoing	New Market-based Instruments	2004	--	Unknown
LUX9	Voluntary Agreement of 2008	Completed	Co-operative Measures	2008	2010	High
LUX5	EU-related: Combined Heat Power (Cogeneration) (Directive 2004/8/EC) - Grand Ducal Regulation on the compensation mechanism in the framework of the organization of the electricity market and Law on a scheme to protect the environment and to promot...	Ongoing	Legislative/Normative	2010	--	Unknown
LUX6	EU-related: Amended EU Emission Trading Scheme (Directive 2009/29/EC) - Grand Ducal Regulation establishing a scheme for trading emissions of greenhouse gases.	Ongoing	New Market-based Instruments	2010	--	Unknown

Energy Efficiency Policies and Measures in Luxembourg in 2012

Code	Title	Status	Type	Starting Year	Ending Year	Semiquantitative Impact
LUX7	EU-related: Integrated Pollution Prevention and Control IPPC (Directive 2008/1/EC) - Grand Ducal Regulation on the limitation of emissions of certain pollutants into the atmosphere from large combustion plants.	Ongoing	Legislative/Informative	2010	--	Unknown
LUX10	Voluntary Agreement of 2011	Ongoing	Co-operative Measures	2011	2016	High
LUX3	Realising electricity savings potential of industrial cross-cutting technologies	Proposed (advanced)	Financial, Information/Education/Training	2012	--	High

Energy Efficiency Policies and Measures in Luxembourg in 2012

Table 4: Policy measures in the transport sector

Code	Title	Status	Type	Starting Year	Ending Year	Semiquantitative Impact
LUX1	Electric buses development	Ongoing	--	--	--	Unknown
LUX2	Information "car and traffic"	Ongoing	--	--	--	Unknown
LUX3	Adaptation of timetables for bus and train, scheduled transport	Ongoing	--	--	--	Unknown
LUX4	Speed limit reinforcement	Ongoing	--	--	--	Unknown
LUX5	Inlandwater infrastructure development	Ongoing	--	--	--	Unknown
LUX6	Introduction of speed limiter for goods vehicles, buses and coaches	Ongoing	--	--	--	Unknown
LUX7	Project of biofuel vehicles	Ongoing	--	--	--	Unknown
LUX11	EU-related: Passenger Car Labelling on fuel economy rating (Directive 1999/94/EC) - Ordinance of of the Grand Duchy of 06 April 2001 on the availability of fuel consumption information and CO2 emissions during the marketing of new passenger cars.	Ongoing	Legislative/Informative	2001	--	Unknown
LUX12	EU-related: Speed limitation devices for certain categories of motor vehicles (Directive 2002/85/EC) - Grand Ducal	Ongoing	Legislative/Normative	2005	--	Unknown

Energy Efficiency Policies and Measures in Luxembourg in 2012

Code	Title	Status	Type	Starting Year	Ending Year	Semiquantitative Impact
	Regulation of 13 January 2005 amending the Grand-Ducal Regulation of 23 November 1955 on regulation of traffic on all roads					
LUX13	EU-related: Promotion of Biofuels or other Renewable Fuels for Transport (Directive 2003/30/EC) - Marketing of gasoline or diesel used as fuel	Ongoing	Financial, Fiscal	2005	--	Low
LUX8	Reducing fuel consumption by raising fuel prices	Ongoing	Fiscal	2007	--	Medium
LUX9	Ordinance of the Grand Duchy of 22 December 2006 on supporting employment and defining special measures in the area of social and environmental policy (CO2-related vehicle taxes)	Ongoing	Fiscal	2007	--	Medium
LUX10	Ordinance of the Grand Duchy of 5 December 2007 guaranteeing financial support for least-polluting cars	Ongoing	Financial	2007	--	Medium

Energy Efficiency Policies and Measures in Luxembourg in 2012

Table 5: Policy measures in the cross-cutting sector

Code	Title	Status	Type	Starting Year	Ending Year	Semiquantitative Impact
LUX1	Promotion of decentralised renewables in the building sector by 2007 (solar thermal plants; PV plants, decentralised)	Completed	Financial Measures	1996	2007	Medium
LUX2	Ordinance of of the Grand Duchy of 30 May 1994 for the production of electrical energy based on renewables and CHP	Completed	Financial Measures	1998	--	High
LUX3	Realising the potential for decentralised renewables in the building sector (solar thermal installations, PV, excluding biomass, heat pumps)	Ongoing	Financial Measures	2008	2012	Low
LUX4	Use of biomass in households (e.g. pellet heating) according to the Ordinance of the Grand Duchy of 21 December 2007 on promoting rational energy use and renewables	Ongoing	Financial Measures	2008	2012	Medium
LUX7	EU-related: Promotion of Electricity from Renewable Sources (Directive 2001/77/EC) - Grand Ducal Regulation of 8 February 2008 on the production of electricity based on renewable energy sources.	Ongoing	General Energy Efficiency / Climate Change / Renewable Programmes	2008	--	Unknown
LUX5	Further realising of potential for decentralised renewables (excluding biomass)	Proposed (advanced)	Financial Measures	2010	--	Medium

Energy Efficiency Policies and Measures in Luxembourg in 2012

Code	Title	Status	Type	Starting Year	Ending Year	Semiquantitative Impact
LUX6	Further expansion of decentralised biomass use	Unknown	Financial Measures	2010	--	Low

Annex 2

Country Profile

Energy Efficiency Trends

Overview

Since the year 2000 the overall energy efficiency is mainly driven by the transport sector. A coupling of the overall development to the European development is not derivable from the ODEX. Therefore the overall assessment of energy efficiency trends from aggregated numbers is not possible. The decline of the ODEX from

Industry

The Luxembourgian industry is dominated by iron and steel industry in terms of energy consumption. Within the last few years, there has been a decrease in energy efficiency of this industry due to structural changes, which lead to decreased overall production and therefore decreased efficiency. For the other branches no clear trend can be derived. Due to the small number of enterprises in Luxembourg (e.g. there are only 21 enterprises active in the chemical industry (2008)), structural and production-related aspects are more influential to annual efficiency indicators than mid-term trends.

Households

Since 2000 the ODEX for the household sector has decreased significantly. The decrease is mainly driven by the large number of newly built efficient buildings due to the population increase.

Transport

The transport sector in Luxembourg is mainly dominated by external effects. The main driver is the transit traffic, which causes up to 70 percent of the overall energy consumption in Luxembourg. Due to this increase the ODEX rises by 25 % up to the mid 2000s and then decreases to 5% over the 2000 level in 2011. The effect of relative energy prices compared to the neighbour countries is a major driver for this development.

Energy Efficiency Policy measures

Institutions and programmes

In 2011, the second National Energy Efficiency Action Plan (NEEAP) of Luxembourg in accordance with the EU Directive on "energy end-use efficiency and energy services" (2006/32/EC) was submitted by the Luxembourgian Ministry of Economy. It comprises a set of ongoing and planned energy efficiency programmes and measures in order to achieve the energy saving target of 9 % in the period 2008-2016 under the ESD and also includes potential measure impacts.

Industry

Since 1995 a chain of voluntary agreements with the industry is in action. A saving target of about 1 % p.a. has been negotiated within all the agreements since then.

Households, Services

The main policies within the household sector address the building sector, which is highly dynamic due to the tremendous increase of population within the last 15 years. Therefore a lot of construction work under the regulation of the energy saving building codes has been performed. The actual building codes – dating from 2008 – tightened the standards for new buildings by 30 % compared to the 1996 code. New Regulations are expected to be finalized in 2012.

In addition financial subsidies are granted for renovation and top-runner new buildings.

Transport

The transport sector is still highly dominated by the transit traffic. Due to rising fuel prices in the neighborhood countries (Belgium, France and Germany), trucks in transit traffic tend to buy their fuel in Luxembourg. Also residents from the neighborhood countries drive to gas stations near the border to buy petrol or diesel fuel. After a rise of the Luxembourgian fuel prices since the mid 2000s, the share of transit traffic has decreased and therefore the energy efficiency of Luxembourgian transport rises.

Selected Energy Efficiency Measures

Sectors	Title of Measure	Since	Energy savings (PJ)	CO ₂ savings (kt)
Household	Promotion of efficient refrigerators (A++)	2010	0,01	1
Household	EU-related: Energy Performance of Buildings (Directive 2002/91/EC) - Improvement in the overall energy efficiency of private dwellings (WD 2008) (new/old buildings)	2008	0,16	13
Household	Old building upgrade programme	2008	0,04	3
Household	Promotion of energy-efficient new homes (new building compared with WD2008: low-energy housing, passive housing)	2008	0,02	2
Household	Renewal of oldest heating systems	2008	0,02	2
Household	Support of efficiency labelling	2008	>0	>0
Tertiary	Improvement in the U-values of the non-domestic buildings (WD2008)	2008	0,21	14
Industry	Voluntary Agreement	2008	0,17	16
Transport	Reducing fuel consumption by raising fuel prices	2007	0,14	12
Transport	Ordinance of the Grand Duchy of 22 December 2006 on supporting employment and defining special measures in the area of social and environmental policy (CO ₂ -related vehicle taxes)	2007	0,15	13
Transport	Ordinance of the Grand Duchy of 5 December 2007 guaranteeing financial support for least-polluting cars	2007	0,17	14
General cross-cutting	Realising the potential for decentralised renewables in the building sector (solar thermal installations, PV, excluding biomass, heat pumps)	2008	0,05	5
General cross-cutting	Use of biomass in households (e.g. pellet heating) according to the Ordinance of the Grand Duchy of 21 December 2007 on promoting rational energy use and renewables	2008	0,1	7

