



Energy Efficiency trends and policies in LATVIA

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EXECUTIVE SUMMARY

This report is the Latvia national case study for the ODYSSEE - MURE project and presents both the recent energy efficiency trends in the period 2000–2019 on the basis of indicators extracted from the ODYSSEE database and analysis of energy efficiency measures based on MURE database. The project is financed under the Horizon 2020 Programme.

There was a trend towards rapid rise both for the total primary energy consumption and for the total final energy consumption in the period 2000-2019. The former value in this period increased by almost 27%, while the latter – even by 33%. The main reason for such a rapid rise was the high GDP rate and private consumption growth. The recession of economy stopped the tendency of growth and caused decrease of energy consumption which, in turn, came to an end in 2010.

In Latvia, the two dominant energy consuming sectors are households and transport. In 2019, the share of transport was 26.9% and in comparison with 2000 the growth was by 3.9% points. The share of households fell by 8.6% points in comparison with 2000 and in the year 2019 households consumed 32.2% of total energy consumption.

Since 2000 both final and primary energy intensities (climatic corrections) had decreased. The decrease in final intensity within this period was by around 34.2%, but primary energy intensity – by 32.6%. The calculated for noted observed period decrease in final energy intensity had constituted average 2.6% per year, but decrease in primary energy intensity - in average 2.5% per year. In 2019, primary energy intensity amounted to 0.29 koe/€2010 and final energy intensity was 0.25 koe/€2010.

In order to assess the actual results of energy efficiency policies and measures, an aggregated energy efficiency indicator ODEX, developed in the ODYSSEE database, is used. The energy efficiency policies and measures implemented in Latvia since 2000 had contributed in the observed period to the efficiency improvement by 27 %, or a mean annual improvement of 2.3%. This means that if these policies and measures had not been implemented, the final energy consumption would have been 27% higher in 2019 (or approximately 1 Mtoe). Most of the efficiency progress is registered in manufacturing industry (43%), followed by transport (32%) and households (28%).

A longer-term vision for energy policy developments had been established by the government through at first by the “Latvia’s Long-term Energy Strategy 2030 – Competitive Energy for Society” and currently by the National Energy and Climate Plan 2030. Sustainable energy resources use through higher energy efficiency and increased use of renewables is one of Latvia priorities in the on-going National Development Plan of Latvia for 2014-2020 followed by new National Development Plan for the 2021-2027 planning period.

The most important actions are to be taken in residential sector. In the Residential sector the legislative/normative and financial support measures are the main ones. At the same time, the importance of informative measures for motivation of stakeholders for energy efficient renovation of buildings is underlined as well.

It has to be noted the significance of the financial support. The financial measures cover energy efficiency measures which might be combined with the installation of local RES technologies for heat

and power production for self-consumption. A wide range of EU Funds co-financed programmes are ongoing implementation in this planning period, up to 2023, and will be continued in the new planning period, up to 2030.

The electric energy consumption is covered by general policy measures like labelling of appliances, smart metering. The special co-financing programme of the country specific Emissions Allowances Auctioning Instrument is currently provided to widely demonstrate low energy building technologies and smart urban lighting.

Given that there is no car manufacturing industry in Latvia, in Transport sector energy efficiency measures are aimed at ensuring good technical maintenance of motor vehicle (by providing systematic (annual) inspection of the technical conditions of the vehicle), promoting choose of energy consumption and emissions efficient engine's vehicles, improving the transport system planning/organisation and the effective use of the transport infrastructure and public transport and promoting the electromobility.

1. ECONOMIC AND ENERGY EFFICIENCY CONTEXT

1.1. ECONOMIC CONTEXT

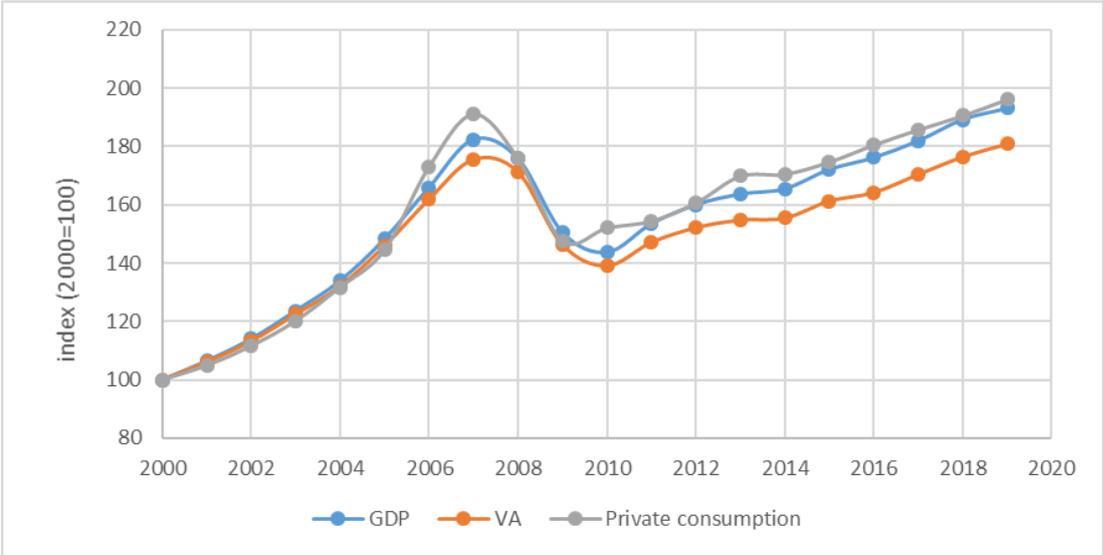
Reforms implemented in Latvia and integration in the EU has left positive impact on the economic development of the country. Rapid economic growth was observed in the period 2000-2007. A substantial inflow of foreign capital from 2005 to 2007 stimulated significant increase in the private consumption and investments in Latvia. The average growth rate of the GDP exceeded 10%.

Since the second half of 2007, the growth rates began to decrease which was determined by the processes influencing both internal (weakening of domestic demand incentives) and external (decrease of growth rates globally) economic environment. During the crisis, the GDP decreased by one fourth. Since the end of 2009, the economic recession in Latvia has stopped, and the growth resumed. From 2011 to 2019, the GDP increased on average by 4.7% annually.

The services sector had the dominating share in Latvia value added (VA) total (around 76% in the year 2019) followed by industry (around 20%, 2019), while the agriculture sector had a minor role (4.3%, 2019). During the last 13 years only minor changes in the relative contribution of the above mentioned sectors in VA total may be noted, e.g. the contribution of the services sector increased by 4% points and, whereas the contribution of industry decreased by 3% points.

The economic crisis had a substantial effect on the average VA and private consumption growth indicators for the 19 year period (2000-2019). In the industry sector the average annual growth of VA for the years 2000-2007 constituted 8.4%, while for the years 2000-2019 this indicator constituted only 3%. A similar situation is seen in the services sector as well where the values of average annual growth of VA were respectively 8.7% (2000-2007) and 4.6% (2000-2019). Only agriculture may be noted as the sector in which the impact of economic crisis on the annual growth of the sector VA was minimal, namely, the sector values of this growth were 4.2% (2000-2007) and 2.9% (2000-2019) respectively. Finally, the average annual growth of private consumption for the years 2000-2007 constituted 10%, whereas for the years 2000-2019 this indicator constituted only 4.7%.

Figure 1: Macro-economic development in Latvia 2000-2019 at constant prices

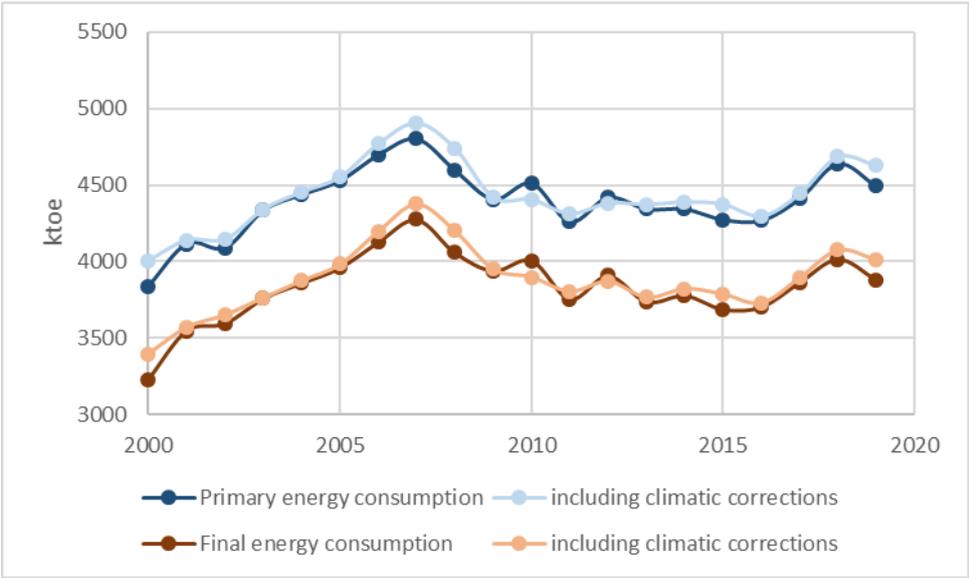


Source: ODYSSEE database

1.2. TOTAL ENERGY CONSUMPTION AND INTENSITIES

There was a trend towards rapid rise both for the total primary energy consumption and for the total final energy consumption in the period 2000-2019. The former value in this period increased by almost 27%, while the latter – even by 33%. The main reason for such a rapid rise was the high GDP rate and private consumption growth. The recession of economy stopped the tendency of growth and caused decrease of energy consumption which, in turn, came to an end in 2010.

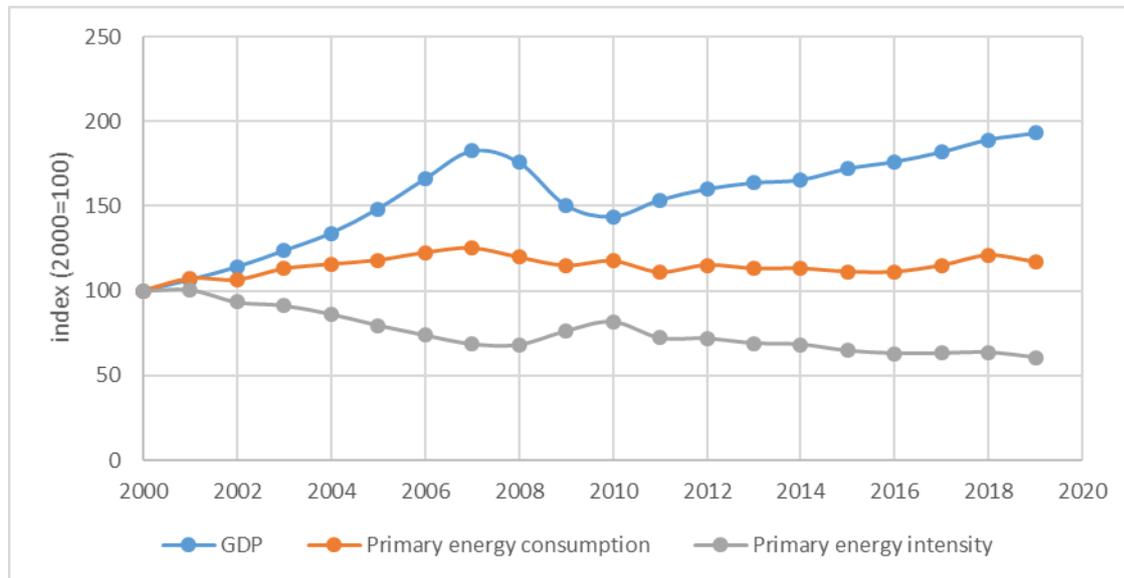
Figure 2 Development of primary and final energy consumption in Latvia 2000-2019



Source: ODYSSEE database

Differing from total primary energy consumption which in Latvia is essentially influenced by the ratio of the imported and domestic energy, the total final energy consumption (climatic corrected) after 2007 shows a relatively consistent reduction trend (average 2.2%). Obviously, all the implemented energy efficiency raising measures in all sectors have had a positive impact.

Figure 3 Decoupling of energy consumption and GDP, 2000 - 2019

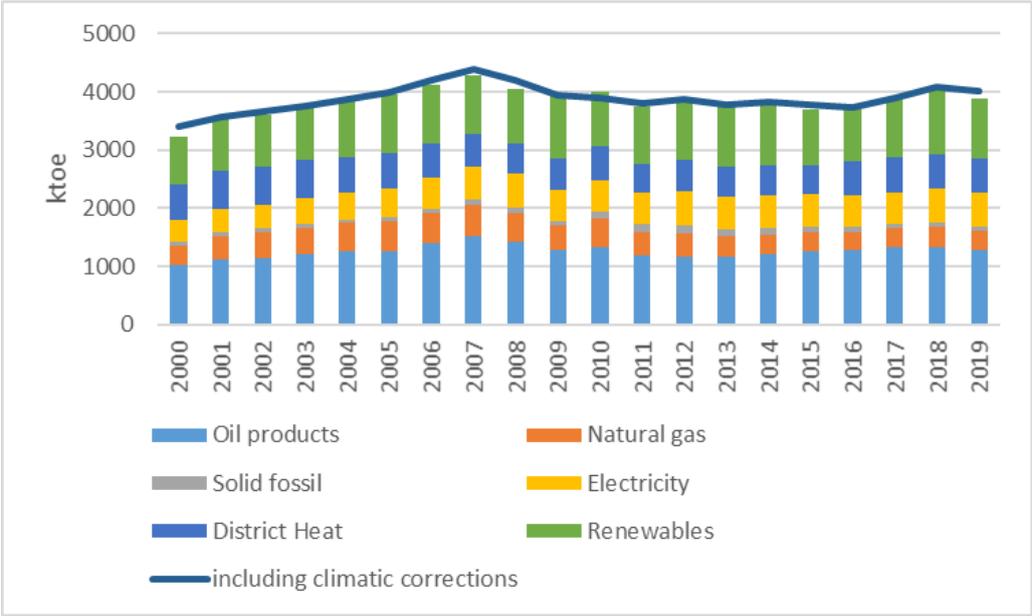


Source: ODYSSEE database

When analysing the total final consumption as to structural fuel changes in the period 2000-2019, the following key factors could be underlined:

- The consumption (in absolute units) of natural gas, oil products, wood fuel as well as electricity grew by 5-47%, while district heating (DH) decreased by around 13.4%.
- The share of DH fell from 18.4% to 13.4%, the main causes – the measures taken for improving energy efficiency in buildings which led to decrease in the DH consumption (in absolute units), and switching from DH system to de-centralised supply systems based on natural gas and RES.
- The consumption of oil products increased by 22.4% but the share grew from 32.5% to 33.2%, the main cause – rapid increase in the number of private cars;
- The growth in the number of electric appliances in households and developments in the services sector raised the total electricity consumption by around 47%, while its share in the total final consumption increased by 2.9% points;
- The wood fuel share increased only by 0.4% points in the period.

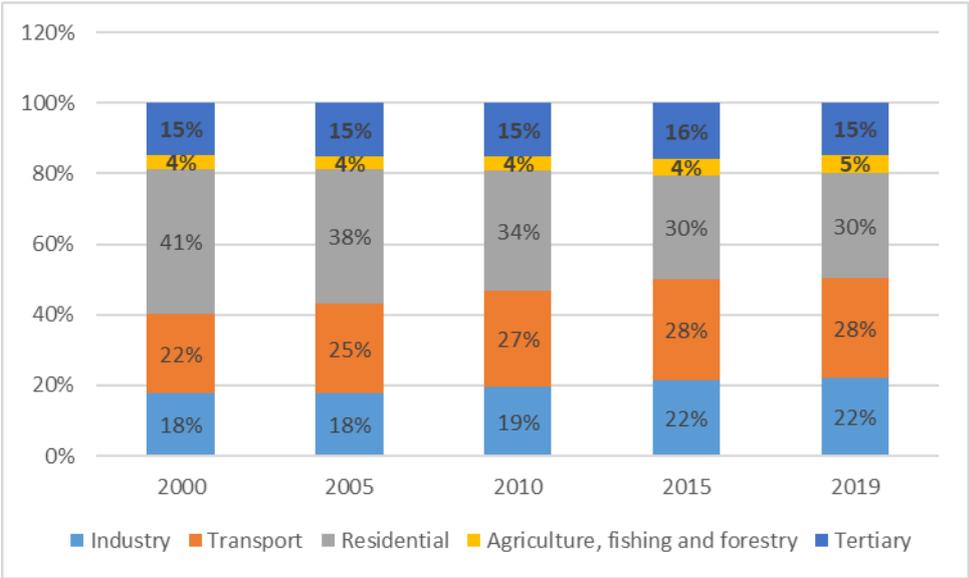
Figure 4 Total final energy consumption by fuel in Latvia 2000-2019



Source: ODYSSEE database

The composition of final energy consumption by end-users is illustrated in Figure 5 . In Latvia, the two dominant energy consuming sectors are households and transport. In 2019, the share of transport was 26.9% and in comparison with 2000 the growth was by 3.9% points. The share of households fell by 8.6% points in comparison with 2000 and in the year 2019 households consumed 32.2% of total energy consumption. From 2000 to 2019, the share of industry increased from 17.7% to 21.7%. The shares of agriculture and the tertiary sector were fairly constant throughout the period.

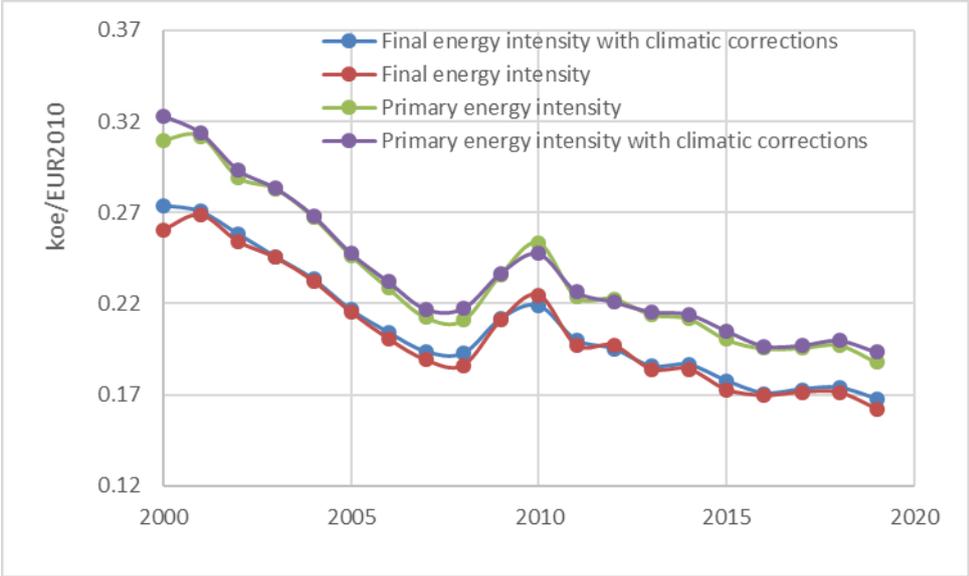
Figure 5 Final energy consumption by sectors in Latvia, 2000 – 2019



Source: ODYSSEE database

In the period 2000-2019, the primary energy and final energy consumption grew in Latvia. On the other hand, since 2000 both final and primary energy intensities (climatic corrections) had decreased, see **Figure 6**. The decrease in final intensity within this period was by around 34.2%, but primary energy intensity – by 32.6%. The reasons for such a decrease are complex. Mainly it was because of more efficient use of energy, but also due to structural changes and general growth of national economy.

Figure 6 Development of primary and final energy intensity in Latvia, 2000 - 2019



Source: ODYSSEE

The more rapid decrease in primary energy intensity in the period 2000 - 2007 (see **Table 1**) could be explained by the fact that much attention was given to the measures of energy efficiency raising in the energy conversion sector including a reduction of losses in the DH transmission and distribution networks.

In the discussed 13-year period the calculated decrease in final energy intensity constituted average 2.6% per year, but decrease in primary energy intensity - average 2.5% per year. At the same time **Table 1** demonstrates that the tendencies in intensity variations were quite different in different sub-periods.

Table 1 Variation in primary and final energy intensity with climatic correction in Latvia (average in %/year)

	2000-2008	2009-2015	2016-2019
Final energy intensity	-3.5	-4.6	+2.6
Primary energy intensity	-3.8	-5.2	+2.3

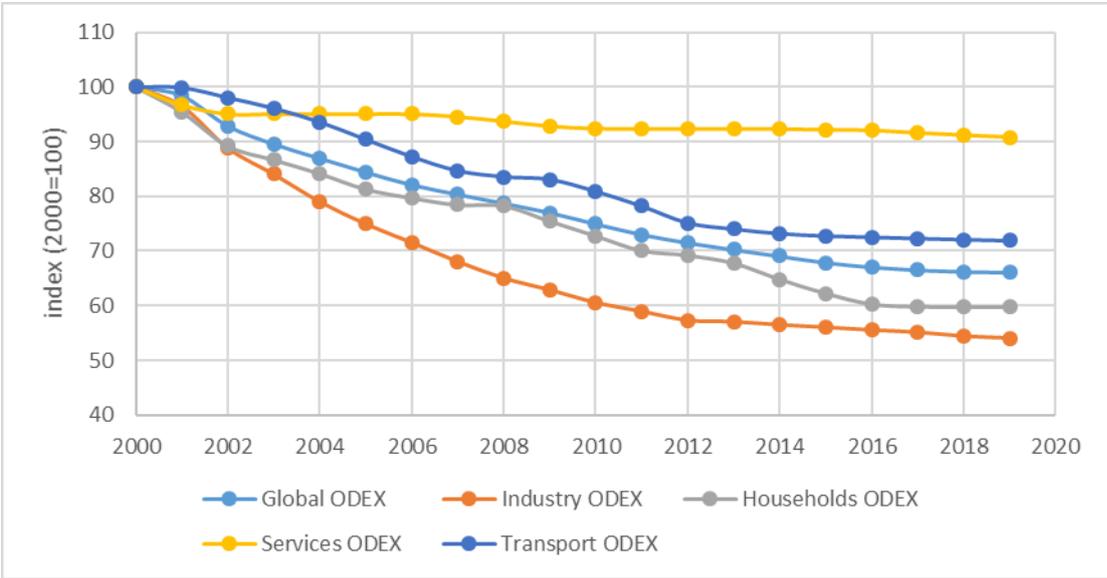
Source: ODYSSEE database

In 2019, primary energy intensity amounted to 0.29 koe/€2010 and final energy intensity was 0.25 koe/€2010.

In order to assess the actual results of energy efficiency policies and measures, an aggregate energy efficiency indicator ODEX, developed in the ODYSSEE database, is used. This indicator summarizes the measured variations in energy efficiency using a single indicator but which is calculated on a detailed level taking the data from around 30 branches, sub-sectors or applications. The bottom-up approach used for the ODEX indicator first looks at the energy efficiency achievements observed for the main types of energy end-use and appliances, and compiles them into an aggregate bottom-up energy efficiency index (each end-use and appliance being weighted based on their weight in total final consumption). It thus provides a substitute indicator to energy intensities (industry and transport) or unit consumption (per dwelling or per square metre) to describe the overall trends by sector. The ODEX is calculated for both individual final consumption sectors and for the economy as a whole and is corrected for structural changes, temperature influence and similar factors not ascribable to energy efficiency.

The energy efficiency policies and measures implemented in Latvia since 2000 contributed in that period to the efficiency improvement by 27 %, or a mean annual improvement by 2.3% (see Figure 7). This means that if these policies and measures had not been implemented, the final energy consumption would have been by 27% higher in 2019 (or approximately 1 Mtoe).

Figure 7 Development of the technical energy efficiency index (ODEX), 2000 - 2019



Source: ODYSSEE database

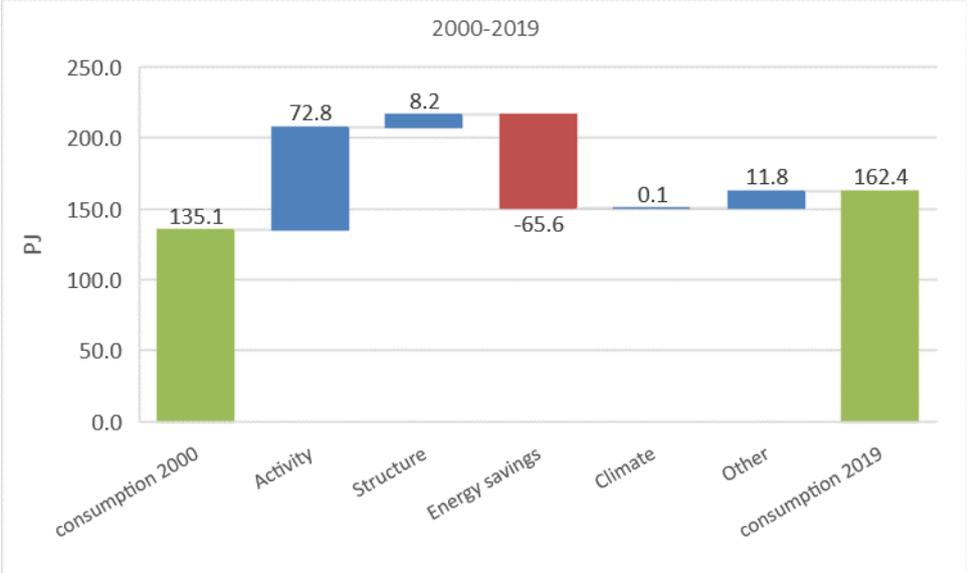
Most of the efficiency progress is registered in the manufacturing industry (43%), followed by transport (32%) and households (28%). Splitting the whole time period into two parts – the years 2000-2007 and 2008-2019 – and analysing the changes in the energy efficiency index in each of them, a conclusion can be drawn that in the first part of the period the index improved much faster. In the transport sector

the energy efficiency index improved average by 2.4% per year in the given period, but in the first and second periods average by 3.5% and 1.2% per year respectively. A similar trend can be observed also in the manufacturing industry where the energy efficiency index in the whole period improved average by 3.3% per year, but the changes in the first and second periods were average by 4.7% and 1.8% per year respectively.

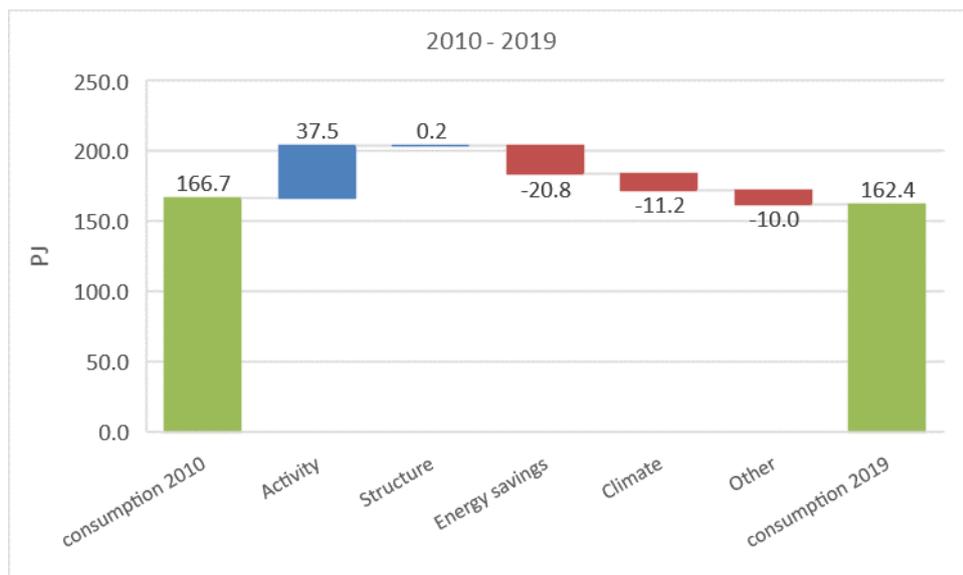
Using the decomposition tool (a detailed description in the ODYSSE project home page¹) the main drivers of the energy consumption changes can be singled out and analysed.

Figure 8 shows that the final energy consumption in the period changed by around 0.7 Mtoe. The increase was mainly determined by the activity growth (VA increase in all sectors of economy, increase of the km driven in the transport sector, etc.) and the impact of climate changes (increase of heating degree days). At the same time this increase was compensated vitally with energy savings and to a lesser degree by the reduction in population.

Figure 8 Decomposition of total final energy consumption in Latvia for the periods 2000-2019 and 2010-2019



¹ <http://www.indicators.odyssee-mure.eu/>



Source: ODYSSEE database

1.3. ENERGY EFFICIENCY POLICY BACKGROUND

Historically a longer-term vision for Latvia's energy policy had been established through the **Guidelines for Energy Policy Developments in 2007-2016** (*Latvijas Enerģētikas Attīstības Pamatnostādnes 2007.-2016.gadam*) adopted by the Latvia Government (Cabinet of Ministers) on 1 August 2006.

As the economic crisis of 2008-2009 had brought significant changes in the Latvia overall economics and energy sector, to update the existing policies and targets (including the achievement of the national EE targets) and plan long-term development of the energy sector the **"Latvia's Long-term Energy Strategy 2030 – Competitive Energy for Society"** was considered by the government on 28 May 2013. This policy document set long-term targets for security of energy supply, competitiveness, energy efficiency and the use of RES. Among others, as the principal preconditions for energy efficiency raising the Strategy states: adoption of raised building standards, including the standard for zero energy consumption building; development of national scale financial instruments to actively promote energy efficiency improvements in residential, especially multi-apartment ones, and public buildings; penetration of smart energy consumption metering; promoting energy efficiency in SME by promoting energy auditing and energy management systems, activating SME associations and involving them in energy efficiency promotion; promoting green purchase in public sector and providing the exemplary role of public sector in the energy efficiency sectors of buildings, heat supply and transportation; stronger requirements for district heating (DH) systems by limiting heat energy loss in DH networks, promoting connection of new consumers to DH systems.

National Energy and Climate Plan 2021-2030 (NECP2030) has been adopted by the Government 4th February 2020.

The NECP2030 clearly provides that energy efficiency is one of the main policy instruments allowing costs to be reduced and the level of energy supply security increased by reducing energy consumption.

The NECP2030 envisaged state in 2030 is as follows:

- the 'energy efficiency first' principle has been fully incorporated into development and policy planning, and into the investment planning and implementation process,
- achievement of the energy efficiency targets set by the State,
- undertakings not only ensure they are energy efficient, but also help promote the energy efficiency of their customers,
- society has become increasingly more aware of energy efficiency issues and there has been an increased involvement and the desire to ensure energy efficiency in people's own lives and the day-to-day life of the community.

The main challenges stated by the NECP2030 are:

1. inadequate consideration of the need to improve energy efficiency in policy and investment planning and implementation,
2. inefficient implementation of EEOS and agreement on improvement of energy efficiency,
3. incomplete energy efficiency monitoring system.

Horizontal key actions and activities stated by the NECP2030 are:

- comprehensive introduction and implementation of the 'energy efficiency first' principle,
- review of EEOS and strengthening and extension of agreements on improving energy efficiency,
- attraction of private investments and elimination of obstacles, creation of financial mechanisms,
- improving energy efficiency monitoring and making it more efficient.

Sectorial key-actions are presented below in the relevant section of Building, Transport and Industry.

Regarding the meeting targets of Article 7 of EED, in Latvia EEOS plays only a minor role. Latvia's EEOS had included up to 31st December 2020 the electricity retail sellers which had sold at least 10 GWh of electricity in 2016, or had sold at least 10 GWh of electricity in any of years related to EEOS period. The main measures to ensure the obligation have been information measures on the optimal consumption patterns of electricity (both residential and non-residential buildings). Thus, the main savings under Article 7 are brought by alternative measures.

Institutional setting

The Ministry of Economics (ME) is the leading state administrative institution in the field of economic policy, including energy policy, formation in Latvia. The ME promotes sustainable development of structurally and regionally balanced national economy. The ME is responsible for energy efficiency objectives, is a responsible authority for EU ERDF and CF co-financing and supervise the implementation of major part of energy efficiency programmes co-financed by EU Funds. The particular division of the ME, consisting of 3 departments (Department of Sustainable Energy Policy, Department of Energy Market and Infrastructure, Department of Energy Efficiency and Crisis Management) and the Unit of Energy Financial Instruments is in charge of energy sector.

Energy Efficiency Monitoring is provided by the State Construction Control Bureau of Latvia, supervised by the ME.

Important role in implementation of energy efficiency and RES policy in Latvia has also Ministry of Environmental Protection and Regional Development (MEPRD) as being responsible for the implementation of the national climate change mitigation policy and thus currently supervising green investment scheme – Emissions Allowances Auctioning Instrument. MEPRD is also responsible for the implementation of those EU Funds co-financed programmes beneficiaries of which are municipalities.

Ministry of Agriculture is in charge of implementation of energy efficiency and RES measures in the agriculture sector as well as in food processing industry, these measures in 2014-2020 programming period have been implemented within the framework of national Rural Development Programme 2014-2020.

Ministry of Transport is in charge of energy efficiency and RES measures implementation in transportation sector.

The existing legal framework related to energy efficiency includes:

- the **Energy Law**, defining the general framework,
- the **Energy Efficiency Law**,
- The **Law On Energy Performance of Buildings**.

Taxation of fossil fuels is established by the **Law on Excise Duties** (for oil products and natural gas) and **Natural Resources Tax** (for coal). The taxation of electricity is prescribed by the **Electricity Tax Law**. *The Natural Resource Tax* defines taxation regarding CO₂ and noxious air polluting emissions.

In the transport sector it is applied differentiated annual tax rates for cars depending on specific CO₂ emissions (cars, light duty vehicles) and EURO class (buses, heavy duty vehicles). Details are provided in the Transport section.

1.3.1. ENERGY EFFICIENCY TARGETS

Based on Article 3 of Directive 2012/27/EU, the indicative national EE target set for Latvia based on primary energy savings in 2020 is 0.67 Mtoe, which is equivalent to final energy savings of 0.457 Mtoe, providing for energy savings in multi-apartment residential buildings, central and municipal government buildings, industry, services and transport, as well as district heating systems. Meeting the above-noted EE target directly contributes to achieving the national renewable energy (RES) target to increase the share of RES in gross final energy consumption up to 40%, as well as greenhouse gas emission mitigation target.

The NDP of Latvia 2014-2020 states 4 key indicators to be reached in 2020 and 2030:

- The proportion of energy produced from RES in the total gross energy consumption – at least 40% in 2020
- Energy consumption towards generating the GDP (in kg of toe equivalent per EUR 1000 of GDP) – 280 (in 2020) and < 150 (in 2030), baseline 373 (2010)
- Energy dependence: net energy resource imports/gross domestic energy consumption, plus bunkering (%) – 44.1 (in 2020) and <50 (in 2030), baseline 41.6 (2010)

- Intensity of GHG emissions in the economy (tones of CO₂ eq. per EUR 1000 of GDP) – 0.794 (in 2020) and 0.752 (in 2030), baseline 1.188.

Currently the implementation of 2014-2020 planning period programmes is on-going, the implementation will continue up to 2023 included. Thus, the National Operational Programme “Growth and Employment 2014-2020 planning period” states to reach the following quantitative targets in 2023:

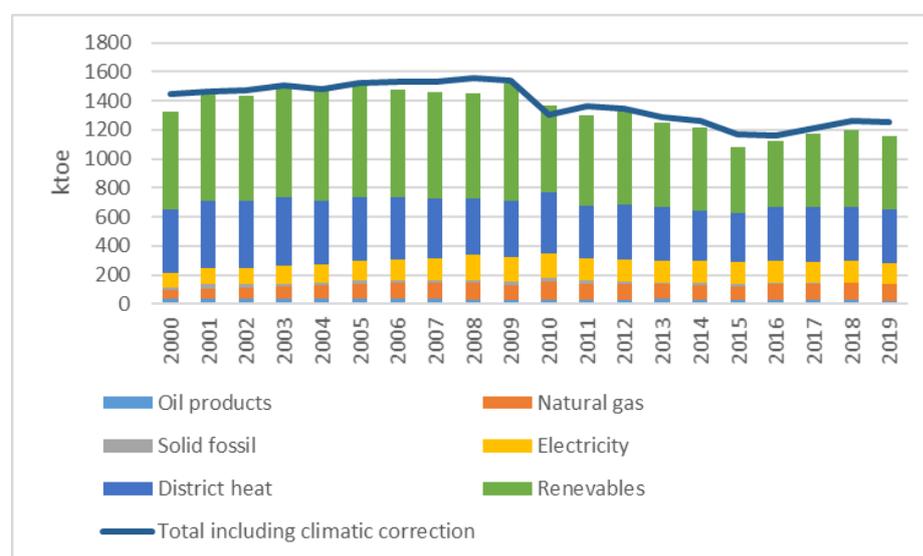
- Average specific thermal energy consumption for heating in buildings – 120 kWh/m²
- Energy intensity in manufacturing industry – 263.9 kg of oil equivalent per 1000 EUR (2010 relative prices),
- RES share in energy consumption of manufacturing industry – 51%,
- RES share in heat energy produced by district heating – 60%.

2. ENERGY EFFICIENCY IN BUILDINGS

2.1. ENERGY EFFICIENCY TRENDS

Final energy consumption in households from 2000 to 2019 increased by around 4%, whereas at the same time electricity consumption increased essentially – by 50%. The most significant change in the final energy consumption, next to the above mentioned increase of electricity consumption, was the consumption increase of natural gas – by 66% and decrease of district heating (DH) – by 16% and wood fuel – by 13%.

Figure 9 Final energy consumption in households



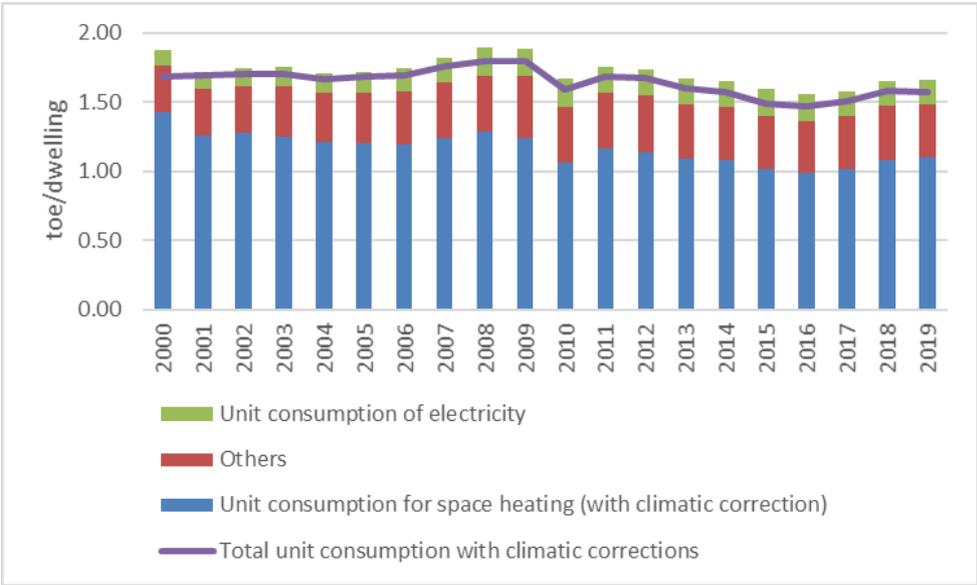
Source: ODYSSEE database

The associated shares of the various fuel types in residential final energy demand for the years 2000 and 2019 have changed. Major changes include the decrease in the share of district heating (by -5%

points) and the increase in the share of natural gas (by +3.3% points) as well as the increase in the share of electricity (by +4.4% points). The share of wood decreased by 5% points in that period.

Total unit consumption per dwelling (see Figure 10) in the given period decreased by around 4.7%. This change was determined by the interaction of two different factors. If the consumption of space heating unit per dwelling for this period decreased by around 25%, then electricity consumption of appliances and the consumption of lighting unit per dwelling increased by 50%. The implemented energy efficiency measures to reduce heat losses in buildings positively impacted the tendency towards the change of unit consumption for heating in households.

Figure 10 Unit consumption of households in toe/dwelling (total and space heating climatic corrected), 2000 - 2019

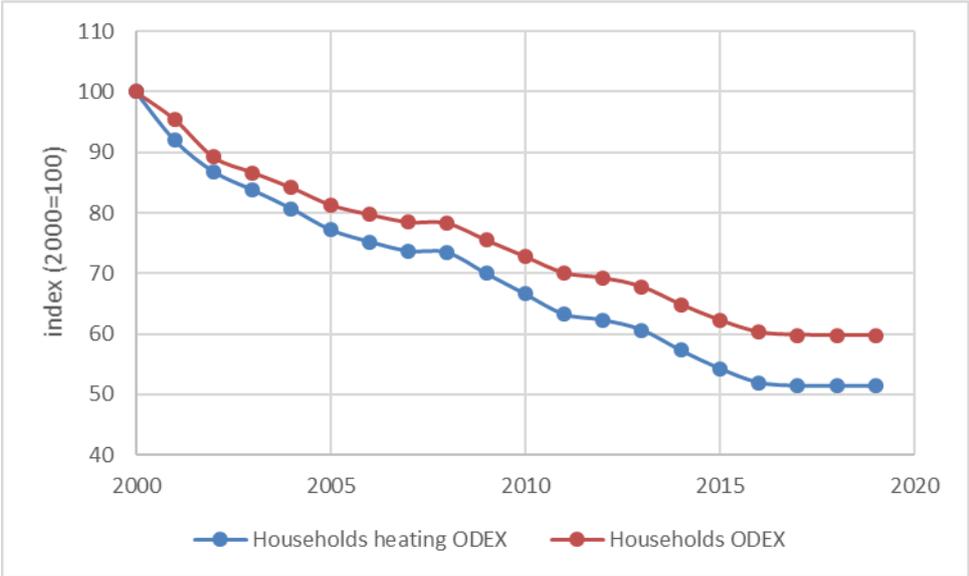


Source: ODYSSEE database

The main reason of increased electricity consumption was the growing number of appliances (e.g. freezers, washing machines, dishwashers, PCs and other small appliances) used in households.

In the period 2000-2019 the total energy efficiency indicator for households improved by 28%. The greatest contribution to the positive trend towards the indicator change was improving energy efficiency for space heating in residential buildings. Were this improvement of energy efficiency missing, final energy consumption in the residential sector would be by 0.23 Mtoe higher in the year 2013.

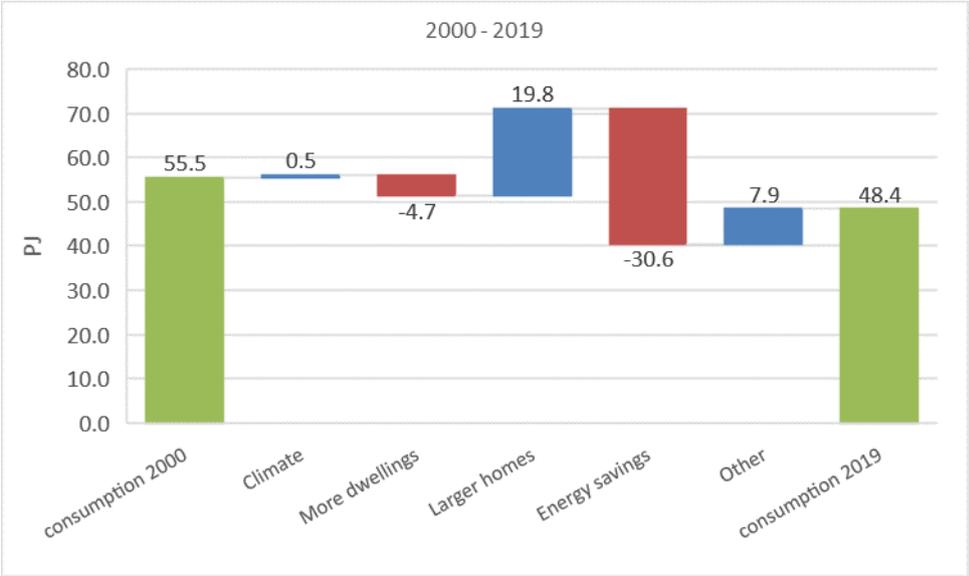
Figure 11 Energy efficiency index of households, 2000 - 2019

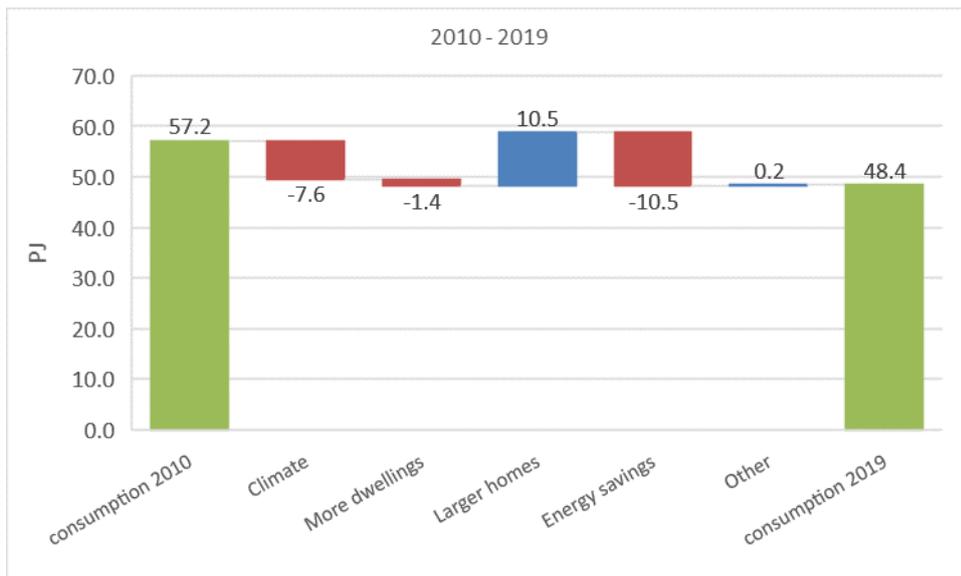


Source: ODYSSEE database

Figure 12 decomposes the changes in energy consumption for space heating in the period 2000-2019. The increase in dwelling space and heating degree days which determine the increase of energy consumption fully was compensated by the reached energy savings and insignificant decrease of dwelling numbers. As a result energy consumption for heating in this period decreased by 0.19 Mtoe.

Figure 12 Decomposition of final energy consumption in the households sector for the periods 2000-2019 and 2010-2019

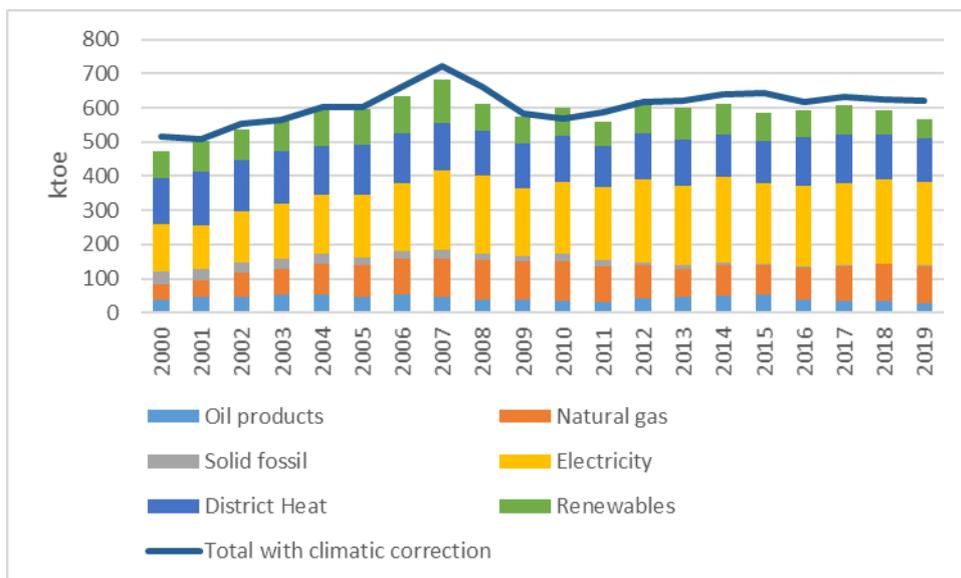




Source: ODYSSEE database

In the period 2000-2019 the share of the services sector in total VA increased by 4.3% points and it was 76% in the year 2019. The energy consumption of services (or tertiary sector) comprises the energy used in public and private buildings (e.g. public and private offices, shops, schools, hospitals).

Figure 13 Final energy consumption by energy carrier in the services sector in Latvia, 2000-2019



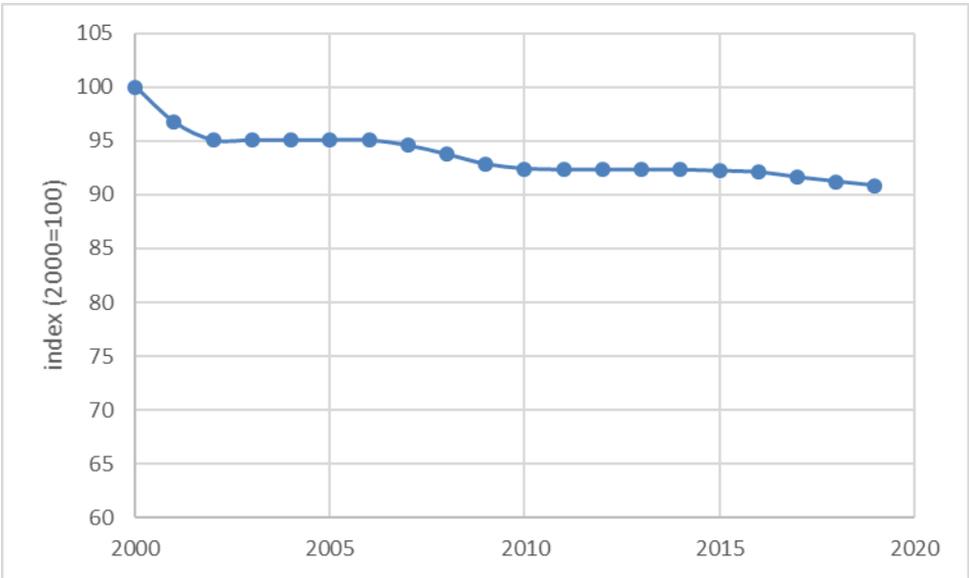
Source: ODYSSEE database

In the period 2000-2019 the final energy consumption in the services sector increased by 27.4% (see **Figure 13**). The most significant developments were the increase in natural gas consumption (by 90%), electricity (75%) and biomass (24%) on the one hand, and on the other – the decrease in coal consumption (68%). District heating consumption fluctuated rather strongly depending on the number of degree days and decreased by 6% in the period under consideration. During the period not only the

final energy consumption changed, but also the importance of separate fuels and kinds of energy. In the period from 2000 to 2019 significant shifts between different fuel types can be observed. Gas increased its share significantly from 9.4% in the year 2000 to 13.9% in 2019, while the share of coal from 7.3% in the year 2000 to 1.8% in 2019. The share of electricity increased from 28% in the year 2000 to 38.6% in 2019, whereas district heating decreased from 30% in the year 2000 to 22% in 2019. The share of wood fuel almost did not change during the given period.

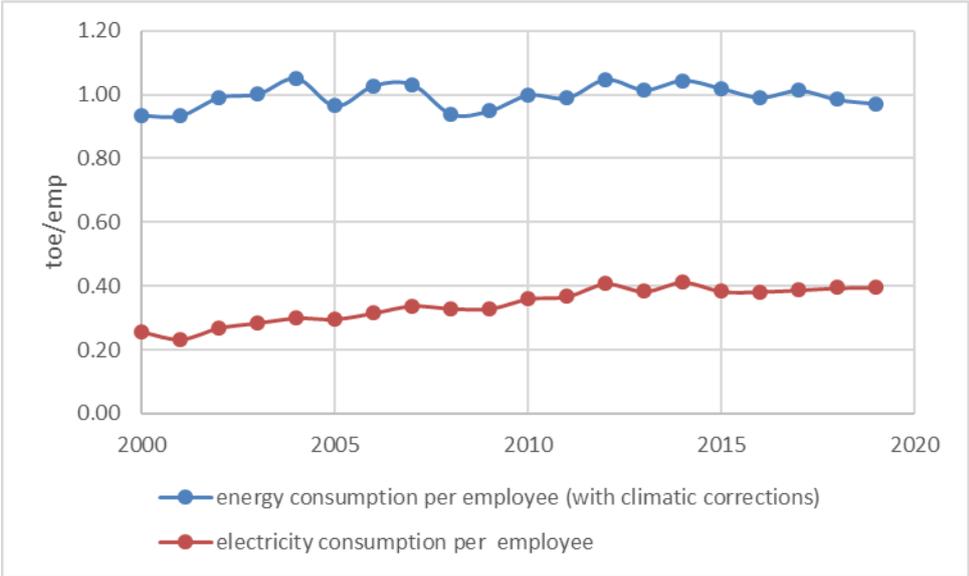
As noted above, the final energy consumption in the tertiary sector from 2000 to 2019 increased by 27.4%. Whereas at the same time energy intensity per value added in the services sector (see **Figure 14**) decreased by 33 %, but electricity, in fact, did not change at all (increase by 0.8%). Taking into account the increase in number of different electrical appliances, electricity consumption per employee in the sector increased more than twice in the period 2000-2019.

Figure 14 Development of the energy efficiency index (technical ODEX) in service sector, 2000 – 2019



Source: ODYSSEE database

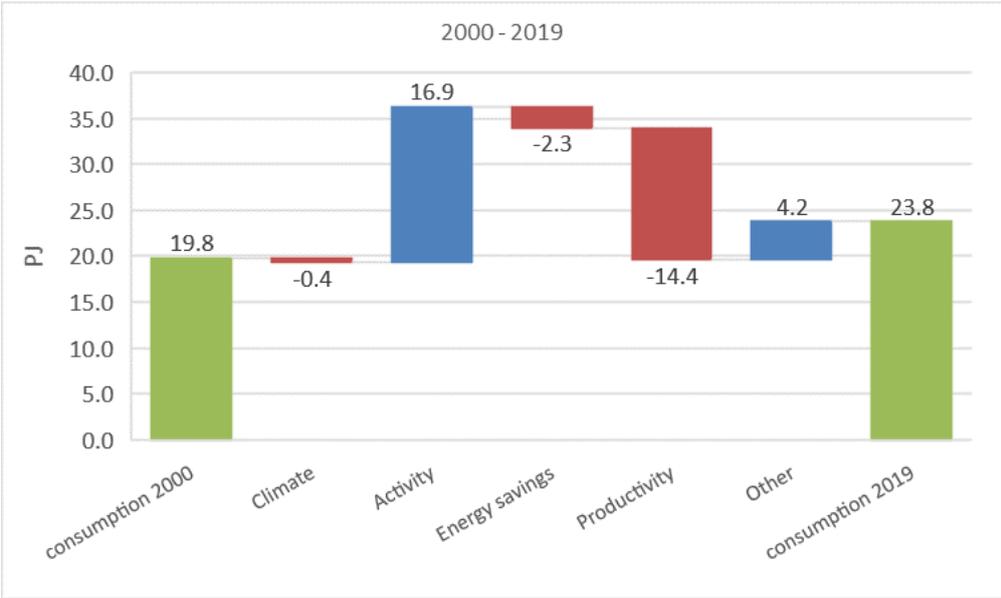
Figure 15 Energy consumption by employee in the tertiary sector



Source: ODYSSEE database

In 2019 energy consumption in the tertiary sector increased slightly more than by 0.1Mtoe in comparison with the year 2000. Using decomposition method, a conclusion can be drawn that the increase of energy consumption was mainly determined by the growth of economic activity in the sector (value added) and less by the heating degree difference between the years 2000 and 2012. The increase of energy consumption in the sector was largely compensated by the productivity growth in the sector (see Figure 16).

Figure 16 Decomposition of final energy consumption in the service sector for the periods 2000-2019



Source: ODYSSEE database

2.2.1 Energy efficiency policies of National Energy and Climate Plan 2021-2030 (NECP2030)

The NECP2030 envisaged state in 2030 is as follows:

- the average thermal energy consumption of the building stock for heating is > 30% less than 2020;
- energy efficient renovation provided for at least 2000 multi-apartment buildings and at least 5000 single family buildings (energy efficient renovation is combined with zero-emission RES micro-technologies installed, or with renovated district heating connections);
- improved energy performance of state and municipal buildings assured;
- a complex long-term solution for improvement of energy performance of the residential stock has been developed and implemented.

The key actions of NECP2030 in the building sector includes:

1. **to promote the energy consumption reduction in residential buildings, state and municipal buildings, as well as in production buildings.** The existing (2014-2020 planning period, implementation will be finished in 2023) energy efficiency improvement programmes for buildings will be continued in the 2021-2027 planning period (implementation up to 2030). The NECP2030 also provides for the raising of private investment for energy efficiency improvement projects (developed ESCO market), which will allow a general increase in the funding available for renovation of buildings. The energy efficiency improvement of state buildings will be continued. It is also important to support energy efficiency measures in the sector of municipal buildings and the NECP2030 provides for the reconstructions or renovations of the existing buildings, including renovations of individual or local heating systems, and purchasing/installing RES micro-technologies for heat and electricity production.
2. **to ensure the implementation of energy efficiency improvement measures in single-family houses and built complexes with a small number of buildings.** Hitherto, single-family houses and individual complexes have been supported by the State to a limited extent. The new support programme has been established in 2021 only. Since single-family houses in Latvia are on average less efficient than multi-apartment buildings, beyond 2021 it will be necessary to support energy efficiency improvement measures in single-family buildings and at the same time the proposal is to set also a mandatory condition for installing zero-emission RES technologies in these buildings during the implementation of energy efficiency improvement measures. Since implementers of these measures are private individuals, it will be necessary to simplify the application procedure and provide possibility for potential beneficiaries use municipal energy consultants or the RES one-stop agency for administrative support. As far as is possible, the co-payment diversification rules should be refined, taking into account the value of the property in which the measures are taken and the solvency of the population, and as far as the replacement of heating installations is concerned, existing air quality in the particular territory.
3. **to ensure long-term complex solutions for reducing energy consumption in the Latvian residential stock and to raise the necessary additional investments.** The NECP2030 aims to create a long-term complex solution for the residential building stock with a quantifiable target

by 2050. The NECP2030 provides for appropriate studies and being updated in 2023 with a solution found. It is necessary to combine both public and private investments. Given the lack of experience in the ESCO involvement, guidelines must be developed for the preparation ESCO projects and organisation of tenders for the public sector, and there are also plans to draw up public guidelines for the preparation of contracts and organisation of tenders for energy efficiency services². It is necessary to ensure that municipalities and public authorities can accept long-term commitments (up to 20 years) when an ESCO project is implemented. A state-owned development finance institution ALTUM will continue to develop financial instruments for financing energy-efficiency projects. Thought is also being given to developing the ESCO market by addressing market failures, since commercial banks do not offer long-term financing to providers of energy efficiency services under long-term conditions. The ESCO market could also be developed by incorporating the possibility of implementing energy efficiency projects directly with ESCO³.

Mix of legislative, information and investment co-financing measures are used in the building sector, which are in more details presented below. The investments to improve the energy efficiency of buildings can be optionally combined with the installation of RES micro-capacity technologies to produce heat and electricity dominately for self-consumption.

Also the fiscal policies and measures have the impact on energy consumption in the building sector. However, as the fiscal measures are of cross-sectorial character, we have included the description of them at the end of our report, in Industry section. Thus, in the Buildings section we provide only the relevant key-notes on them, if necessary.

The following analysis of energy efficiency measures is based on Latvia part of the MURE database (<https://www.measures.odyssee-mure.eu/>). On-going and proposed measures⁴ are considered in the analysis.

The energy efficiency measures analysis is structured in the following sub-sections:

2.2.2 Legislative developments for energy efficiency performance – overall description followed by specification for residential and non-residential buildings, smart metering is included in this section as well,

² An ESCO procurement manual has been developed within the framework of the project "QualitEE - quality certification systems for energy efficiency services" supported by the EU programme Horizon 2020. This manual is designed to promote the application of quality criteria in respect of energy efficiency services for an energy efficiency project at the procurement stage and is planned to be used in the public and private sectors, for energy efficiency project managers/coordinators, as well as for energy efficiency service providers (information provided by Latvia's Long-term Strategy for the Renovation of Buildings, manual available at: <https://qualitee.eu/lv/news/projektu-vadibas-kvalitates-kriteriji-un-esko-iepirkuma-rokasgramata/>)

³ The development of ESCO market is not detailed in our National Report. However more details on current legislative developments is provided in the MURE database General cross-cutting section measure GEN-LV3897

⁴ The completion of measures mostly relates to the end of financial support programmes. The financial programmes implemented both in the previous, EU 2007-2013, planning period and in the national green investment scheme (Climate Change Financial Instrument which had been finished in 2015) are kept in the MURE database, but not analysed in this report.

- 2.2.3 Financial measures, specified for residential and public buildings
- 2.2.4. Public Sector: energy management systems, public procurement
- 2.2.5 Energy efficient public infrastructure.

2.2.2. Legislative developments for energy efficiency performance

To implement the requirements of the Directive 2010/31/EU on Energy Performance of Buildings, in December 2012 the Latvia's Saeima (Parliament) adopted the re-casted **Law On The Energy Performance of Buildings** which came into force in 9th January 2013.

The provisions of the Directive 2018/844/EU, amending the Directive 2010/31/EU, have been included by **the Amendments of the Law, adopted in October 2020** which came into force in 2nd November 2020. These Amendments state that the Law shall regulate (1) minimum energy efficiency requirements for existing buildings, (2) provisions for energy certification of buildings, (3) provisions for the inspection of boilers and air-conditioning systems of the existing building and (4) requirements for use of high-efficiency systems in buildings.

Regarding the existing, in exploitation buildings, the 2020, Amendments provide that requirements have to be stated regarding (1) energy consumption and primary energy consumption of building, (2) functionality of the engineering systems of automatization and management of building, the installation of self-regulating devices for micro-climate control in rooms, metering/accounting of consumed energy.

In its turn, the minimum energy efficiency requirements for new buildings and buildings to be reconstructed and renovated shall be regulated by the national Construction Standards taking into account the exceptional provisions of the Law on the Energy Performance of Buildings.

Minimum thermal insulation standards

After re-establishing independence of Latvia, starting already from 1991 the requirements for building envelopes were significantly increased. Since 01 January 2003 Latvian Construction Standard LBN 002-01 "Thermotechnics of Building Envelopes" came into force, which determined the requirements for external envelopes' thermal engineering for new and reconstructed buildings as well as for new heated premises to be installed in already built buildings. The normative values have been used in the building design, the real values of built building might be higher than the normative ones however shall not exceed the defined maximum values (for details of historical values see MURE Household sector Database measure *HOU-LV0786* and Services sector Database measure *SER-LV1711*, hereinafter the code of the measure is indicated).

However, the calculations, presented by the "Report on energy performance requirements in Latvia for new buildings and buildings to be reconstructed in compliance with cost-optimal level pursuant to Article 5 of Directive 2010/31/EU on the energy performance of buildings" (Ministry of Economics, 17 December 2013), had showed that the noted above minimum energy performance requirements did not meet optimum ones with respect to a part of the buildings and construction elements. Thus in April 2014 The Amendments to the Latvia Construction Standard LBN 002-01 had been amended in order to approach the cost-optimal levels of minimum energy performance requirements, these

amendments, adopted in April 2014, had introduced the provisions of the Directive 2010/31/EU. From 1st October 2014 the new version of the Construction Law is in force, thus the Government substituted the relevant Construction Standards as well. In 30 June 2015 the Government had adopted the new Construction Standard LBN 002-15 “Thermotechnics of Building Envelopes”, however these regulations, compared to the previous 2014 version, had not been changed in point of fact (see *HOU-LV0782 and SER-LV1702*).

Important change related to the approach for definition of minimum thermal insulation standards has been adopted in 2019. Namely, **from the 1st January 2020 the new Latvia’s national Construction Standard LBN002-19 “Thermotechnics of Building Envelopes”** is in force (see *HOU-LV0784 and SER-LV3874*). The new Construction Standard incorporates directly the energy performance indicators (EPI) for heating (in kWh per m² annually). Thus, there is no necessity to apply the normative values for particular construction elements. In its turn, the objective of the maximal U values is to eliminate the design of unsafe construction elements. The Standard introduces the approach (taking into account high diversity of construction materials and their fast development) that primarily the data of manufacturer should be used and default values defined by the Standard will be used if the manufacturer data are not available. The application of values of thermal bridges can be done based on specific catalogues thus allowing to avoid too general values. Standard also pays the particular attention to limit penetration of moisture in the building elements.

Table 2 Maximum Values of Heat Transmittance Coefficients for the Construction Elements $U_{RN}W/(m^2 \times K)$ and for the Linear Thermal Bridge , $W/(m \times K)$, in force from 01 January 2020, defined by the Latvian Construction Standard LBN002-19.

No.	Construction elements	Residential houses, homes for the elderly, hospitals and kindergartens	Public buildings, except homes for the elderly, hospitals and kindergartens	Industrial buildings
1.	Roofs and coverings which are in contact with outdoor air	0.20	0.23	0.25
2.1	Floors on the ground	0.20	0.25	0.35
2.2	Floors on the non-heated cellar or floors with the ventilated space under the floor	0.30	0.35	0.40
3.1	Walls external	0.23	0.25	0.30
3.2	Walls of traditional log buildings without heat insulation layer in the wall	0.6	0.65	0.65
4.1	Windows, balcony doors,	1.10	1.10	1.30

No.	Construction elements	Residential houses, homes for the elderly, hospitals and kindergartens	Public buildings, except homes for the elderly, hospitals and kindergartens	Industrial buildings
4.2	Outer doors	1.80	2.00	2.20
5.	Thermal bridges	0.20	0.20	0.35

Energy Efficiency Classes of the Buildings. Energy Performance Indicators for existing (in exploitation), renovated/reconstructed and new buildings.

It had been introduced by the Governmental Regulations No 383 „Regulations On Energy Certification of Buildings” (in force 19 July 2013-15 April 2021) six (A-F) energy efficiency classes of residential buildings. For these historical values of energy efficiency classes see *the Table 1C in HOU-LV0780* (residential buildings) and *Table 1C in SER-LV1705* (non-residential buildings).

Currently, the new, 2021, Governmental Regulations No 222 „Regulations Regarding Energy Certification of Buildings and Energy Efficiency Calculation Method” (in force 16th April 2021) introduce **new approach for definition of energy efficiency classes’ values** based on both (1) energy consumption for heating (A+, A-F classes), and (2) non-renewable primary energy consumption (A+, A-G classes). The specific energy consumption values are presented in the tables below. A+ class is the voluntary class. The nearly-zero energy building shall correspond to the A class.

Compared to previous regulations, the important difference is that, the new 2021 Regulations introduce the specific energy consumption values depending on the heated area of the residential building (historically only unified approach had been applied). Thus, the new approach provides for cost-effective specific energy consumption in smaller buildings. For more details see the measure *HOU-LV0780*.

Similarly, the new 2021 Regulation introduces the specific energy consumption values for heating depending on the heated area of the non-residential buildings as well. In its turn, the specific primary energy consumption values depend on the type (use) of non-residential building (historically only unified approach had been applied). Another important new provision relates to non-typical buildings of service sector (for instance, vehicle repair services, buildings used for electronic communication, etc.). For these non-typical buildings the energy efficiency classification is not applied. Namely, the non-typical buildings shall correspond to the requirements of national Construction Standards. Thus, the new approach provides for cost-effective specific energy consumption in smaller service sector buildings and allows for economically based construction solutions in non-typical buildings of service sector. For more details see the measure *SER-LV1705*.

Regulations on Heat Supply and Ventilation (Conditioning)

The basic version of the actual **Latvia’s Construction Standard LBN 231-15 “Regulations on Heat Supply and Ventilation (Conditioning) of Residential and Public Buildings”** have been adopted in May

2015 and has come into force 20 June 2015. The Standard prescribes the requirements for design and installation of heating systems and ventilation and air conditioning systems in new build, renovated and reconstructed public and private buildings. The provisions for buildings with other operating purposes are set as well. The Standard sets up requirements for installation of boilers, furnaces and fireplaces fired with liquid, gaseous or solid fuel in different type of buildings. Special requirements are set for boiler houses with installed capacity larger than 500 kW. Special requirements are set for chimneys and flue system for different types of fuel. Important provisions are provided by the Amendments, among them : (i) **Amendments, in force 20 June 2020**, have introduced the provision to install in non-residential buildings, which have nominal heat supply system (or joint heat supply and ventilation system) capacity or air conditioning system (or joint conditioning and ventilation system) capacity above 290 kW, the on-line building's automation and energy management system on condition if it is technically possible and economically reasonable. This provision relates to those construction projects which will be approved starting from the 1st January 2023 ; (ii) **Amendments, in force 1st November 2021**, have introduced the provision that in multi-apartment buildings the water-based central heating system, that is common to the whole building or a part of the building, shall be designed as a two-pipe heating system ; it is possible to design an independent heating system separately for each apartment (floor) as well ; forced circulation is recommended for water-based heating systems ; if the supply and return pipes of the water-based central heating system are located in the basement of the building, it is recommended to provide pressure regulators for the riser-pipes.

RESIDENTIAL BUILDINGS

The actual specific energy consumption

Table 3 The statistics of the floor area of residential buildings (data from the Latvia's Long-term Strategy for the Renovation of Buildings, 2021⁵)

	Main use	Number of buildings	Floor area, million m ²	% of total number of residential buildings	% of total floor area of residential buildings	Building no exist in fact
1	Single dwelling houses	309929	36.50	85.15	40.1	655
2	Two dwelling houses	13938	2.20	3.8	2.4	13
3	Three and more dwelling houses	39477	51.55	10.85	56.6	30
4	Community accommodation for various social group	647	0.83	0.2	1	1
	Total residential buildings	363991	91.08	100	100	699

The NECP2030 provides the following data on the average heat consumption for heating⁶ :

- single dwelling houses – 139 kWh/m² per year,
- multi-apartment houses - 137 kWh/m² per year.

⁵ Data of the State Real Estate Cadastral Information System provided by the State Land Service on 1 January 2019

⁶ Data of the Buildings information system : Buildings Energy Certificates Register, data on 5th September 2019.

It is envisaged that investment co-financing measures, implemented within the framework of Latvia's National Operational Programme "Growth and Employment 2014-2020 planning period", on improving energy efficiency in multi-apartment buildings will decrease this figure by about 15% in 2023 (120 kWh/m² per year should be reached).

Energy efficiency classes of residential buildings

Table 4 Classification of residential buildings according energy consumption for heating, reference levels, kWh/m², in force 16th April 2021.

Class	Heated area, m ²		
	50 -120	120 – 250	above 250
A+	≤ 35	≤ 35	≤ 30
A	≤ 60	≤ 50	≤ 40
B	≤ 75	≤ 65	≤ 60
C	≤ 95	≤ 90	≤ 80
D	≤ 150	≤ 130	≤ 100
E	≤ 180	≤ 150	≤ 125
F	above 180	above 150	above 125

Table 5 Classification of residential buildings according non-renewable primary energy consumption, reference levels, kWh/m², in force April 2021⁷

Class	Heated area, m ²		
	50 -120	120 – 250	above 250
A+	≤ 65	≤ 65	≤ 65
A	≤ 110	≤ 100	≤ 95
B	≤ 140	≤ 130	≤ 125
C	≤ 160	≤ 155	≤ 145
D	≤ 200	≤ 190	≤ 165
E	≤ 230	≤ 210	≤ 180
F	≤ 260	≤ 260	≤ 220
G	above 260	above 260	above 220

Nearly zero energy residential building

Nearly zero energy building shall have high energy efficiency standard together with providing good indoor microclimate, according construction standards, and hygiene protection conditions during whole year according normative standards:

⁷ Notes to the Table: (1) for the evaluation the energy consumption for heating, hot water, mechanical ventilation, cooling is considered (consumption for lighting not included); (2) specific factors for primary energy consumption and CO₂ emissions calculation are provided in the Annex 7 of the noted new Regulations.

- specific energy consumption values, both for heating and primary non-renewable energy shall correspond to the A class,
- the installed energy consuming equipment of building's engineering systems shall correspond to the "A" class of energy labelling or requirements of eco-design,
- the indoor temperature, during heating period shall correspond to at least II category, during non-heating period – to at least III category (the Standard LVS EN ISO 16798-1:2019)
- the air exchange, provided by ventilation, shall correspond to at least III category (the Standard LVS EN ISO 16798-1:2019),

According the Latvia's Construction Standard LBN002-19 "Thermotechnics of Building Envelopes", nearly zero energy building values apply if time period of approval of a construction intention of new building is 1st January 2021 and hereinafter, on condition the energy performance indicator of nearly zero energy building is technically or functionally possible and the benefit analysis of the useful lifetime of the building does not indicate to losses.

Residential buildings undergoing reconstruction

Table 6 Energy Performance Indicators for residential buildings undergoing reconstruction, set by the Latvia's Construction Standard LBN002-19

	Time period of approval of a construction intention	Multi-apartment buildings	Single and 2-apartment buildings
		Energy Performance Indicator for heating	
1	21 November 2015 – 31 December 2020	not above 90 kWh/m ²	not above 100 kWh/m ²
2	After 01 January 2021	not above 80 kWh/	not above 90 kWh/m ²

Energy performance requirements for existing, in exploitation, residential buildings

To detail the provisions for the existing buildings, in 10th December 2020 the Government has adopted the Regulations No 730 (2020) "**Minimal Requirements for Existing, in Exploitation, Buildings**". **The minimal provision is correspondence of the existing building to the energy efficiency class "E"**.

According the *Law On Residential Houses Management* (Article 6) the provision of minimal energy efficiency requirements is one of mandatory functions of the building management. The particular chapter IV „**Requirements for ensuring the energy efficiency of the residential house**”, focused to increase the management quality of dwelling houses with the worst energy performance indicators, have been included in September 2011 (in force 1st January 2012) in the Governmental Regulations No 907 (2010) "*Regulations Regarding the Survey, Technical Sevicig, Current Repairs and Minimal Requirements for Energy Efficiency of the Residential House*" and have been amended in January 2014. The manager of the building shall plan the energy efficiency measures to reach the noted threshold values - it is expected that the costs of the energy efficiency measures will not create burden due to the costs related to energy consumption will decrease. The manager of building should implement the measures providing the highest heat energy savings rated to investments. It is also defined the list of mandatory minimal technical and management measures in case the heat losses are identified,

provisions to regulate heat supply regime depending on season, to provide adequate heat consumption metering, etc (see HOU-LV0785).

Provision on **mandatory individual heat consumption accounting for consumers connected to district heating system or central heat source** enables citizens to supervise their individual consumption and the energy costs involved based on their actual energy consumption thus encouraging users to save energy. Mandatory for existing multi-apartment buildings from 1st January 2021. Mandatory for new projects and reconstruction projects of buildings - from 25th October 2020 ; for projects funded by public funds – provision came in force 2016 (see *HOU-LV0795*).

The new, noted above Governmental Regulations No 730 (2020) “Minimal Requirements for Existing, in Exploitation, Buildings” provide that heat consumed in a multi-apartment building shall be accounted separately for each group of residential rooms and non-residential area by remotely readable individual heat consumption meters or, if the installation of them, is not technically possible or economically justified, individual heat cost allocators for each heating element shall be used. The residential house manager evaluates the economic justification for installing individual heat consumption meters and individual heat cost allocators. The evaluation methodologies are provided in the Annexes of the noted Regulation. A re-assessment of the technical feasibility and economic justification must be carried out after a renovation of a heating system in an apartment building where individual heat consumption meters or individual heat cost allocators have not previously been installed. Buildings are equipped with self-regulating devices for separate regulation of the air temperature in each room or, if justified, in a group of rooms, if the building's heating system that produces heat is changed (heat generator). The above provisions entered into force on 1 January 2021. In turn, installed individual heat consumption meters and individual heat cost allocators that were installed before 01.01.2021 and are not remotely readable, a remote readability must be ensured by 1 January, 2027 or they must be replaced by remotely readable ones.

In its turn, smart electricity meters installation is planned to be finished already in 2022 (see *HOU-LV0796*). Important, Latvia's EEOS has included up to 31st December 2020 the electricity retail sellers which had sold at least 10 GWh of electricity in 2016, or had sold at least 10 GWh of electricity in any of years related to EEOS period. The main measures to ensure the obligation have been information measures on the optimal consumption patterns of electricity (both residential and non-residential buildings).

NECP 2030 foresees to modernise the metering of gas consumption as well.

NON-RESIDENTIAL BUILDINGS

The NECP2030 provides the following data on the average heat consumption for heating for service sector buildings⁸.

⁸ Data of the Buildings information system : Buildings Energy Certificates Register, data on 5th September 2019. Data for floor area are taken from the Latvia's Long-term Strategy for the Renovation of Buildings, 2021.

Table 7 Average thermal energy consumption for heating and total floor area of service sector buildings

	Annual specific heat consumption for heating, kWh/m ²	Total floor area, million m ²
office buildings	145	6.53
buildings of educational institutions	147	6.93
buildings of medical institutions –	154	2.02
hotel and restaurant buildings	116	2.35 (hotels)
buildings of sport institutions	132	1.24
wholesale and retail buildings	102	5.08
other types of buildings	185	

Energy efficiency classes of non-residential buildings

Table 8 Classification of non-residential buildings according energy consumption for heating, reference levels, kWh/m², in force 16th April 2021

Class	Heated area, m ²			
	50 -120	120 - 250	above 250 office buildings, education institution buildings, hotels, restaurants, sport buildings, wholesale and retail trade buildings	above 250 hospitals
A+	≤ 35	≤ 35	≤ 35	≤ 40
A	≤ 60	≤ 50	≤ 45	≤ 50
B	≤ 75	≤ 65	≤ 65	≤ 70
C	≤ 95	≤ 90	≤ 90	≤ 100
D	≤ 150	≤ 130	≤ 110	≤ 120
E	≤ 180	≤ 150	≤ 150	≤ 160
F	above 180	above 150	above 150	above 160

Table 9 Classification of non-residential buildings according non-renewable primary energy consumption, reference levels, kWh/m², in force 16th April 2021⁹.

Class	Type of Building		
	office buildings, education institution buildings, sport buildings	hospitals, hotels, restaurants	wholesale and retail trade buildings
A+	≤ 90	≤ 130	≤ 120
A	≤ 110	≤ 170	≤ 150
B	≤ 160	≤ 240	≤ 190
C	≤ 210	≤ 280	≤ 215
D	≤ 250	≤ 320	≤ 230

⁹ Notes to Table: (1) for the evaluation the energy consumption for heating, hot water, mechanical ventilation, cooling, lighting is considered; (2) specific factors for primary energy consumption and CO₂ emissions calculation are provided in the Annex 6 of the noted Regulation.

E	≤ 300	≤ 380	≤ 300
F	≤ 400	≤ 450	≤ 400
G	above 400	above 450	above 400

Nearly zero energy non-residential building

Nearly zero energy non-residential building shall correspond to the “A” class. The same other general requirements, as for the nearly zero residential buildings, apply (see above), in addition the labour protection conditions shall be ensured as well. According the national Construction Standard LBN002-19 “Thermotechnics of Building Envelopes”, nearly zero energy building values apply if time period of approval of a construction intention of new building is:

- 1st January 2019 and hereinafter – for public buildings
- 1st January 2021 and hereinafter – for other non-residential buildings,

on condition the energy performance indicator of nearly zero energy building is technically or functionally possible and the benefit analysis of the useful lifetime of the building does not indicate to losses.

Non-Residential buildings undergoing reconstruction

Table 10 Energy Performance Indicators for non-residential buildings undergoing reconstruction, set by the Latvia’s Construction Standard LBN002-19

	Time period of approval of a construction intention	Public buildings (owned or used by state or municipal authorities)	Other non-residential buildings
		Energy Performance Indicator for heating	
1	21 November 2015 – 31 December 2020	not above 110 kWh/m ²	not above 110 kWh/m ²
2	After 01 January 2021	not above 90 kWh/m ²	not above 100 kWh/m ²

Energy performance requirements for existing, in exploitation non-residential buildings

To detail these provisions, in 10th December 2020 the Cabinet of Ministers have adopted the Regulation No 730 (2020) “Minimal Requirements for Existing, in Exploitation, Buildings” [5]. **The minimal requirement is correspondence of the building to the energy efficiency class “E”.**

By 1 January, 2025, non-residential buildings with an effective rated output for heating or combined heating and ventilation or for air conditioning or combined air conditioning and ventilation capacity of which exceeds 290 kW shall be equipped with a building automation and control system. This system shall provide: (1) the ability to continuously monitor, record, analyse and adjust the energy use of a building, (2) the ability to compare and evaluate the energy performance of a building, detect efficiency losses in a building's engineering system and inform the building manager about how to improve the building's energy performance; (3) working online with the building engineering system and the ability to perform functions independently of the manufacturer of the engineering system components. Also (4) by 1st January 2025, at least one charging point for electric vehicles shall be installed in each public building with more than 20 car parking lots.

2.2.3. Financial Measures

This section provides:

1. the information on the financial measures which are ongoing in current, 2014-2020 planning period (implementation of the particular projects will be finished in 2023),
2. the information on their continuation and new measures in the new, 2021-2027 planning period (implementation will start 2022, depending on the programme).

RESIDENTIAL BUILDINGS

Increasing Energy Efficiency in Multi-Apartment Buildings: EU Funds planning period 2014-2020 (see *HOU-LV0791*). The investments are co-financed by the EU ERDF under the Latvia National Operational Programme (NOP) "Growth and Employment 2014-2020" Thematic Objective No4 "Supporting the shift towards a low-carbon economy in all sectors", Specific Objective 4.2.1.1 "To increase energy efficiency in residential buildings". Investments ensure conformity to the EU Council Recommendations in the area of energy efficiency. The programme is implemented by the state-owned development finance institution ALTUM in the form of complex financial support: grants, loans provided by ALTUM, guarantees provided by ALTUM for loans issued by commercial institutions. As the grants provide up to 50% of the total investment, the total financial value (including private financing) of the programme is around 350 MEUR. Eligible activities include: (1) construction works performed in the building's delimiting outer constructions and in building's parts which are joint ownership of apartment owners for the increase of energy efficiency: (2) renovation, reconstruction or establishment of engineering systems of multi-apartment building, (3) purchase and installation of heat production equipment and hot water production equipment which utilise renewables, (4) supervision of construction works, costs of energy efficiency improvement measures management, costs of building's energy certificate, building technical inspection documentation, construction project. The implementation of the project shall be economically justified - IRR for 35 years period shall be above zero.

Table 11 Financing for increasing energy efficiency in multi-apartment buildings. 2014-2020 planning period

	ERDF financing, EUR	State financing, EUR	Total financing, EUR
Grants (including management and consultation costs provided by ALTUM)	149 983 267	26 467 637	176 450 904
Financial instrument (loans, guarantees for the loans, including management costs of ALTUM)	21 260 050	3 751 773	25 011 823
TOTAL	171 243 317	30 219 409	201 462 726

Energy efficiency improvement in single-family buildings (on-going). To carry out energy efficiency improvement in single-family buildings, the subsidy and guarantee of loan programme has been **established in 2021** (see *HOU-LV3881*). It is available for the single-family building (1) the technical assistance up to 1000 EUR and (2) subsidy up to 5000 EUR (construction works). In its turn, (3) the guarantee might be issued up to 30% of the loan (issued by the commercial institution) and up to 20 thousand EUR. At least 20% heat energy consumption decrease should be reached and building energy class after renovation shall correspond at least to the class “C”. Eligible activities include: construction works in building limiting outer constructions; establishment, renovation or reconstruction of building’s engineering systems, e.g., heating and ventilation systems, including purchase of the equipment and installation costs;; purchase and installation of new water heating boiler, purchase and installation of small scale RES-utilising technologies for heat energy and electricity production for own consumption as well as other activities which are necessary for improvement of energy efficiency of the building on the condition these other activities have to be implemented simultaneously with the activities listed above. The programme is implemented by the ALTUM. Current assigned financing for this programme is 2.374 MEUR (of which 1.2 MEUR allocated for grants and 0.28 MEUR for the technical assistance), Financing for programme’s continuation will be considered within the overall financing for energy efficiency improvement in buildings to be provided by the National Operational Programme for 2021-2027 planning period.

Energy efficiency improvement in residential buildings will be continued in 2021-2027 planning period. The financing will be provided by both the Latvia’s Plan of EU Recovery and Resilience Facility (RRF) and Latvia’s National Operational Programme for 2021-2027 planning period (NOP2027). These programmes will be implemented as the combined financial instrument – grant (up to 49% of project’s total eligible costs), loans provided by ALTUM, guarantees for loans issued by commercial; institutions. RRF will finance multi-apartment buildings only (assigned financing ~ 57.3 MEUR, of which ~ 36.7 MEUR assigned for grants, will be implemented in 2022-2024). In its turn, the NOP2027 plans ~ 148 MEUR ERDF co-financing to co-finance energy efficiency investments in all types of the residential buildings (see *HOU-LV0793*).

In addition, the particular programme is planned to replace non-effective individual households biomass combustion equipment by zero/low-emission heating equipment without implementation of energy efficiency measures in the building. Although the main objective of this programme is to reduce air polluting emissions, it can bring energy end-use savings due to efficient new equipment will be installed. Planned ERDF co-financing is 12.4 MEUR.

To motivate the energy efficient renovations of residential, particularly multi-apartment, buildings, the **Information programme “Let’s Live Warmer”** is implemented on a regular basis (see *HOU-LV0779*). Wide scope of methods are applied to reach and to inform and consult societies of the apartments’ owners regarding conditions and benefits of energy efficiency increase and the best practices of it, available financial support. Programme consults also on the good practice of maintaining the apartment building after renovation.

Another new financial instrument has to be noted as well. Latvia has general terms regarding the state assistance in purchase or construction of residential space. In addition to them, from 1st July 2020 additional **assistance to encourage the purchase or construction of energy-efficient housing is**

available to a specific target group - families with children. This additional assistance is provided in forms of both increased subsidy (grant) and loan guarantee. For details see *HOU-LV4195*.

In its turn, the local municipalities have the possibility to support energy efficiency investments in residential buildings by providing reduction of real estate property tax. During last years the number of municipalities which provide such tax reduction have increased; some examples, including capital city Riga, is provided in the measure *HOU-LV0797*.

Public buildings

Two main sources for financing energy efficiency in public buildings are:

- EU funds co-financed investment programmes,
- National green investment scheme – Emissions Allowances Auctioning Instrument (EAAI) – programmes.

EU funds co-financed investment programmes

Increasing Energy Efficiency in Public Buildings: EU Funds programming period 2014-2020

The investments are co-financed by the EU ERDF under the Latvia NOP's "Growth and Employment 2014-2020" Thematic Objective No4 "Supporting the shift towards a low-carbon economy in all sectors", Specific Objectives:

- 4.2.1.2 "To increase energy efficiency in public and residential buildings" (co-financing investments in State (central government) buildings, see *SER-LV1706*,
- 4.2.2 "To facilitate the increase of energy efficiency in municipal buildings, according to the integrated development programme of the municipality" (municipal public buildings), see *SER-LV1707*

These investments ensure conformity to the EU Council Recommendations in the area of energy efficiency. The financial amount assigned for energy efficient renovation of **state buildings** is around 109.8 MEUR (ERDF co-financing ~93.4 MEUR (85% and national public financing ~ 16.5 MEUR(15%)). At least 30% of heat energy (or heat energy+electricity) savings should be reached in the building as a result of the energy efficiency project; thermal energy consumption for heating should not be higher 90 kWh per m² annually (1st tender) or 110 kWh per m² annually (2nd tender). The tenders have been organised as the restricted tenders. For the 1st tender the projects applications might be submitted by the (i) direct state management authorities, (ii) institutions supervised by them, (iii) derived public persons which are state high schools/universities and research institutions, (iv) state capital companies which fulfil the management of state real estates. For the 2nd tender the projects applications might be the state ltd. companies of the health care sector (hospitals, rehabilitation centres), culture sector, sport centres of national status, dedicated several vocational education institutes, and also the dedicated non-governmental organisations having status of public benefit organization. Eligible activities included: (i) renovation of buildings for the increase of energy efficiency: construction works (insulation) of buildings' boundary structures, insulation of coverings of cellars and upper floors; (ii) reconstruction, renovation or establishment of engineering communications of buildings, (iii) purchase and installation of RES utilising local heat energy or/and electricity production equipment; (iv) reconstruction, renovation or establishment of cooling system of buildings, as well as purchase and

installation of RES using cooling equipment ; (v) energy efficient lighting to be installed both in buildings inner premises and on outer boundary constructions ; (vi) reconstruction or renovation of electricity supply system of the building, including costs of replacement of compressors, pumps, electric motors if provides energy efficiency ; (vii) purchase and installation of energy control and management equipment. These eligible activities have varied depending on the tender. Also the costs of preparation of the projects' technical documentation, energy certification of buildings, projects management and supervision , including supervision of construction works and author supervision have been eligible as well (see *SER-LV1706*)

In EU Funds 2014-2020 planning period, it is supported **energy efficiency investments in education sector**, both general education institutions, vocational education institutions as well as universities/higher education institutions. These energy efficiency investments is the part of the overall Thematic Objective No8 "Education, Skills and Lifelong Learning" of the National Operational Programme "Growth and Employment 2014-2020" focused to improve the general environment (both technical infrastructure, teaching/studying environment and other, see *SER-LV1718*)

In its turn, the financial amount assigned for increasing energy efficiency in **municipal buildings and infrastructure providing public services** is around 100.6 MEUR¹⁰, of which ERDF basic funding ~ 43.5 MEUR, REACT-EU funding (additional ERDF funding) – 42 MEUR, national (state and municipalities) public funding ~ 15.1 MEUR. Eligible activities include: (i) renovation/construction works of buildings for the increase of energy efficiency, including construction works performed in the building's outer constructions, insulation of coverings of cellars and upper floors; (ii) reconstruction, renovation or installation of building's engineering systems, among them ventilation system and lighting system; (iii) renovation/reconstruction of local or autonomous heat supply engineering infrastructure systems; (iv) purchase and installation of heat energy production equipment which utilise renewables; (v) installation of smart energy consumption management technologies. Also the costs of project management, technical documentation, necessary expertizes, author supervision and construction supervision costs, energy certification costs, costs related to the commissioning of the building or the engineering structure are eligible. The latest (5th, 2021) tender, financed by REACT-EU includes such new eligible activities as: (i) purchase and installation of electricity production equipment which utilise renewables, and (ii) purchase and installation of air pollution control equipment (among them – electrostatic filters) if the solid biomass combustion technology is used in the heat supply of the building¹¹ (see *SER-LV1707*). Implementation up to 2023 including.

Increasing Energy Efficiency in Public Buildings: EU Funds programming period 2021-2027

¹⁰ This total sum includes also the REACT-EU financing of 10 MEUR (the last, 5th tender) which is indicatively earmarked for energy efficiency improvement and RES technologies installation in water supply and sewage sector public infrastructure, more details see in the section 2.2.5

¹¹ On condition there is no possibility to connect the building to the district heating system. Installation of air pollution control equipment should be done simultaneously with the reconstruction, acquisition, renewal or replacement of solid biomass utilizing heat production equipment.

Energy efficiency improvement in state buildings will be continued in 2021-2027 planning period.

The financing will be provided by both the Latvia's Plan of EU Recovery and Resilience Facility (RRF) and Latvia's National Operational Programme for 2021-2027 planning period (NOP2027):

- RRF will finance energy efficiency improvement and RES technologies installation in state owned or used buildings which have culture function, including historical buildings and buildings of justice sector, the assigned financing is around 24 MEUR, investments planned in 2022-2025.
- NOP2027 plans to provide 104.4 MEUR of total public financing for state buildings, of which ERDF contribution is planned 88.74 MEUR (85%, see *SER-LV3879*)
- particular NOP2027 programme is planned for vocational education sector and colleges. Investment in energy efficiency to modernize and upgrade the vocational educational sector infrastructure and related engineering networks, including investment in smart energy management, environmentally friendly long-term energy saving solutions or renewable energy production technologies can be part of this overall programme focused to vocational educational sector (overall planned total public financing is around 19 MEUR, of which ERDF – 85% (~ 16 MEUR),
- within another particular NOP2027 programme co-financing of energy efficiency improving measures and smart energy management systems in the infrastructure of culture sector is planned, overall planned total public financing of this programme is around 35 MEUR, of which ERDF -85% (29.6 MEUR).

Energy efficiency improvement in municipal buildings and municipal infrastructure will be continued in 2021-2027 planning period as well.

The measure will continue the improvement of energy efficiency in public buildings of municipalities, the measure also will include reconstruction/renovation of local or autonomous heating system¹², RES equipment for heat and power generation, energy efficient cooling. The financing will be provided by both the Latvia's Plan of EU Recovery and Resilience Facility (RRF, 29.3 MEUR assigned, investments in 2022-2025) and Latvia's National Operational Programme for 2021-2027 planning period [NOP2027 total public investments planned 31 MEUR, of which ERDF – 85% (26.4 MEUR)].

National green investment scheme – Emissions Allowances Auctioning Instrument (EAAI) – programmes.

The overall focus of EAAI programmes is to ensure wide demonstration of implemented projects thus ensuring multiplicative effect. Up to now the following programmes have been co-financed by the national EAAI for the building sector¹³:

- **GHG emissions reduction in the buildings having the status of monuments of state significance:** 1.tender – 8 projects contracted (implementation finished 2020 and 2021, total

¹² on a condition, where it is not technically and legally feasible and economically justifiable to connect the building to the district heating system.

¹³ Financial data are taken from the 2020 Annual Report on the use of EAAI revenues, Table 3 in page 7, <http://polsis.mk.gov.lv/documents/7082>

assigned EAAI financing 8.54 MEUR, see *SER-LV1714*), in 2022 the 2nd tender will be announced with the total EAI financing of 35 MEUR;

- **GHG emissions reduction by low-energy public building** (7 projects contracted, implemented in 2020, total assigned EAAI financing 23 MEUR, see *SER-LV1713*),
- **GHG emissions reduction by construction and demonstration new energy self-sufficient buildings** (2 projects contracted, implemented 2021/2022 ; total assigned EAAI financing 10 MEUR, see *SER-LV1725*).

2.2.4 Public Sector: energy management systems, public procurement

Mandatory implementation of energy management systems (EMS) is stated by the Energy Efficiency Law in those **state direct administration institutions** which have buildings with total heating area 10000 m² and above. The EMS should be implemented up to the 1st November 2017 at the latest or during one year after the noted provision has come into force. The annual report on energy savings has to be submitted (see *SER-LV1710*).

Mandatory implementation of energy management systems (EMS) is stated by the Energy Efficiency Law in the following **municipalities** (see *SER-LV1712*):

- (1) largest Latvia cities (capital city Riga, Daugavpils, Jelgava, Jekabpils, Jurmala, Liepaja, Rezekne, Valmiera, Ventspils) shall implement the certified (according to the standard) EMS. These EMS should be implemented up to 1st April 2017 at the latest.
- (2) other Latvia municipalities shall implement EMS if they have the territorial development index 0.5 and above and population above 10000 inhabitants. These EMS should be implemented up to 1st November 2017 at the latest or during one year after the noted provisions have come into force. The implementation of EMS in these municipalities might be done according to the methodological guidelines published by the Ministry of Economics.
- (3) several municipalities have implemented EMS voluntary.

The municipalities which implement EMS shall provide each year information regarding obtained energy savings to the Ministry of Economics. The EMS relates to municipal institutions, municipal transport, public lighting, public procurement, etc. but does not relate to the activities of companies in which municipalities have shares, participation of such companies in the EMS is voluntary.

Green Public Procurement and Implementation of the Exemplary Role of the Public Sector (see *SER-LV1703* and *SER-LV3884*).

The actual **Public Procurement Law** includes: (i) the Section 19 which defines general framework for green procurement; (ii) the Section 20.4 regarding content of technical specifications defines possibility to include energy efficiency, climate protection/adaptation and environmental protection considerations, (iii) the Section 55 defines special provisions regarding energy efficiency.

To detail the provisions of the Section 19 of the Public Procurement Law the Governmental **Regulations No 353 "Requirements of Green Public Procurement and the Procedure They shall be Applied"** have been adopted and have come into force 01 July 2017, Annexes amended in September 2020. These Regulations defines both: (1) the list of the groups of goods and services for which green procurement provisions and criteria shall be applied mandatory (Annex 1 of the Regulations), and (2)

the list of the groups of goods and services for which green procurement provisions and criteria might be applied voluntary (Annex 2 of the Regulations), in this Annex the energy efficiency criteria, applied for office buildings, are included as well.

The importance of green public procurement is underlined by the Latvia's National Energy and Climate Plan 2021-2027. **Latvia National Energy-Climate Plan 2021-2030 envisages to further develop application of public procurement.** It is intended: (1) to develop public procurement guidelines for RES technologies, and (2) if appropriate, to develop guidelines and provisions for the application of the Green public procurement to sustainable electricity generation.

2.2.5. Energy Efficient Public Infrastructure

Greenhouse Gas emissions reduction by smart city technologies, particularly smart lighting of outdoor public areas is financed by the particular programme of the national Emissions Allowances Auctioning Instrument (21 projects contracted, implementation 2019-2022, total assigned EAAI financing 6.4 MEUR, see *SER-LV1724*).

The REACT-EU financing of 10 MEUR is indicatively earmarked for **energy efficiency improvement and RES technologies installation in water supply and sewage sector public infrastructure.** Eligible activities include: installation of RES technologies for own consumption ; replacement of technological equipment and reconstruction, renovation, demolition or installing of engineering structures, if these activities improve energy efficiency of technological processes, reduce energy consumption and GHG emissions¹⁴; installation of smart technologies that improve the energy efficiency of technological processes. Implementation up to 2023 including.

In EU Funds 2014-2020 planning period it is co-financed two particular investment programmes to **establish business promoting infrastructure:** (1) programme on revitalization of degraded areas, and (2) programme regarding increase of private investments in regions to promote business development in the area (see *SER-LV1720*). The infrastructure shall be related to municipal development programmes. It is supported the creation of the infrastructure of different type. These programmes can bring energy efficiency improvements as well, for instance, by construction and reconstruction/renovation of buildings and their related infrastructure, improvement of public areas lighting infrastructure, water supply and sewage systems, etc. Implementation up to 2023 including.

In its turn, for the EU Fonds 2021-2027 planning period, the EU Just Transition Fund plans the financing of around 59 MEUR to support the public infrastructure necessary for business activities to promote climate-neutral economy in the industrial areas.

Particular programme of National Operational Programme 2021-2027 (20 MEUR financing provided by ERDF) is focused to co-finance implementation of solar PV and related storage technologies. Wide scope of beneficiaries are planned – municipal utilities, energy communities and business sector.

¹⁴ renovation, reconstruction or installation of water supply or sewage distribution, transmission or collection main pipelines is not eligible in this particular programme.

The energy efficiency in buildings measures are complementary with the measures aimed to **increase energy efficiency in Latvia district heating (DH) sector**.

Energy Efficiency Requirements for DH Systems. The Cabinet of Ministers Regulation No 243 (2016) defines the minimum efficiency requirements for DH technologies: (1) heat production boilers (respectively, 92% - gaseous fuel, 85% - liquid fuel, 75% -solid fuel), (2) CHP units (respectively, 80% - gaseous and liquid fuels, 75% - solid fuels), (3) solar heat collectors (respectively, 70% - vacuum tube collectors, 75% - flat plate collectors), (4) heat pumps (shall correspond at least class “C”), (5) annual maximum heat losses in DH pipeline network (from the 1st January 2018 – not higher than 19%, from 1st January 2019 – not higher than 17%) (see *GEN-LV0256*).

The NECP2030 envisaged state in 2030 regarding heat supply is as follows:

- DH systems have been developed that are complex and economically sound and which increasingly use RES technologies (in particular zero-emission technologies);
- Increased number of connections to and users of DH and local heating,
- Individual heating has been made more efficient, with increased use of RES technologies (in particular zero-emission);
- Increased use of central and individual cooling.

In **EU Funds planning period of 2014-2020** the co-financing of investment is provided by Cohesion Fund within the framework of the National Operational Programme “*Growth and Employment 2014-2020*”, the Thematic Objective No.4 “*Supporting the shift towards a low-carbon economy in all sectors*”, the Specific Objective 4.3.1. “*To promote energy efficiency and use of local RES in district heating systems*”. The support is provided for: (i) new RES utilising heat production sources (both additional RES capacities to supply new DH consumers and replacement of existing fossil fuel capacities); reconstruction for increase of energy efficiency of existing heat production sources utilising RES (renovation of heat boilers, construction of heat accumulation units), (ii) construction (widening) and renovation of DH pipeline systems aimed at reducing heat losses. RES-utilising technologies include both combustible (biomass) and solar heat ones¹⁵. The implementation of the projects will be finished in 2023. The assigned Cohesion Fund financing is 49.6 MEUR and DH utilities financing at least 74.4 MEUR.

In its turn, **for the EU Funds 2021-2027 planning period**, the National Operational Programme 2021-2027 plans in total 48 MEUR ERDF co-financing to improve the efficiency and promote the use of RES both in district heating, local heating and individual heating as well as to promote RES technologies implementation in cooling. The detailed split of financing and eligible activities are under elaboration.

2.2.6 Measures Impacts Evaluation

¹⁵ The first large-scale solar heat system has been commissioned in September 2019, operated by DH utility Ltd. “Salaspils Heat (Salaspils Siltums)”, active surface 21672 m², <https://salaspilssiltums.lv/lv/571-pirmais-lielizmera-saules-kolektoru-lauks-baltija-ir-atklats.html>

The Table below presents the single measures and also several particular measures are joint in principal groups to discuss their cumulative impact.

The high impact from the co-financing of energy efficiency investments in multi-apartment buildings is reached due to two main reasons: (i) (rather) low baseline of energy efficiency provides high impact per unit of investment, and (ii) establishing threshold level on specific energy efficiency performance value which should be reached by the projects which pretend to receive co-financing from EU ERDF. In its turn, the impact of the new programme on energy efficiency improvement measures in single-family buildings is evaluated as medium, at the same time the impact will directly depend on the both earmarked total co-financing amount (not yet defined for the whole period up to 2030) and the motivation of the owners of single-family buildings to participate in such programme.

The medium/high impact is attributed to the financial measures, co-financing the energy efficiency investments in public buildings. There is several sub-programmes on co-financing the energy efficiency improvement in public buildings and their cumulative impact can be evaluated as high.

The impact on the low- and self-sufficient building, co-financed by the national green investment scheme – Emissions Allowances Auctioning Instrument – is hard to evaluate as the impact directly depends on the volume of demonstration activities based on the results of the particular project. The general expectation is medium impact, if appropriate implementation and control system is created

Table 12 The impact of selected measures

Measures	Expected savings, semi-quantitative impact evaluation
Energy certification and Energy Performance classes of residential buildings	Medium
Increasing energy efficiency in multi-apartment buildings	High
Information programme “Let’s Live Warmer”	Medium
Energy certification and Energy Performance classes of non-residential buildings	Medium
Increasing energy efficiency of public buildings	Medium/High
National Construction Standard LBN002-19 “Thermotechnics for building envelopes”	Medium
Public sector as an example: demonstrating low-energy and energy self-sufficient building (national Emissions Allowances Auctioning Instrument Programmes)	Medium
Energy efficiency measures in education sector buildings	Medium
State assistance for families with children in purchase of high energy efficiency dwelling	Low/Medium
Promotion of energy efficiency improvement measures in single-family buildings.	Medium

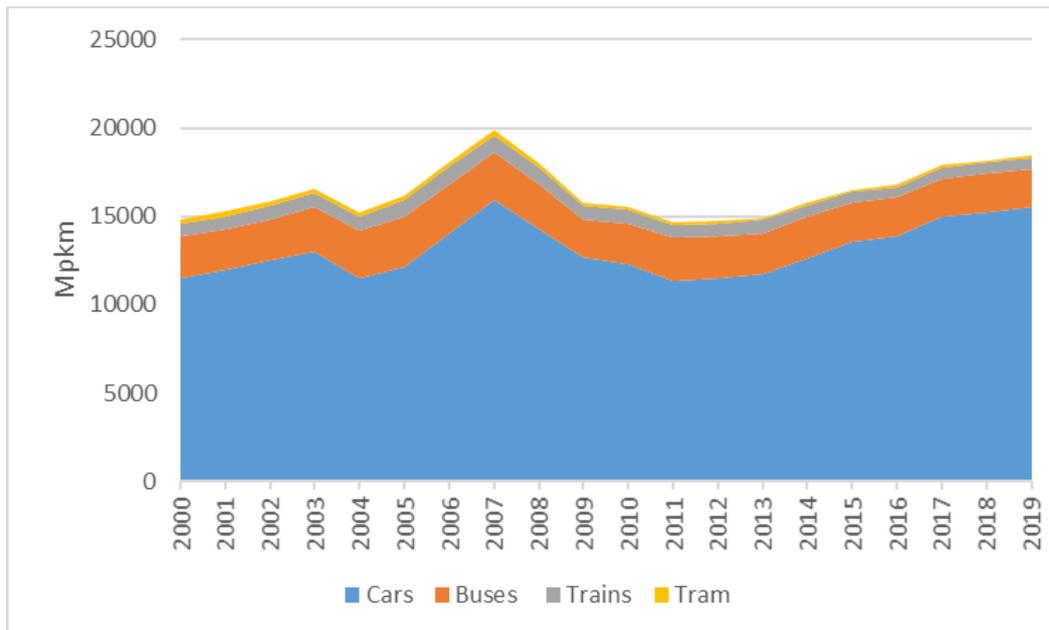
Mandatory individual heat consumption accounting for consumers connected to district heating system or centralized heat source (provisions of the Directive 2018/2002/EU).	Medium
Smart electricity consumption metering	Medium
Energy Management Systems (EMS) in municipalities and state authorities.	Medium

4. ENERGY EFFICIENCY IN TRANSPORT

A. ENERGY EFFICIENCY TRENDS

In 2019 most of passenger movement was ensured by road transport: passenger cars – 82%, busses – 13% and railway – 5%. These modes of transport have demonstrated different trends since 2000 (see Figure 17). The passenger kilometres travelled by passenger car in Latvia increased steadily in the period under consideration (by 30%), while rail and tram travel decreased by around 13% and passenger kilometres travelled by bus almost did not change.

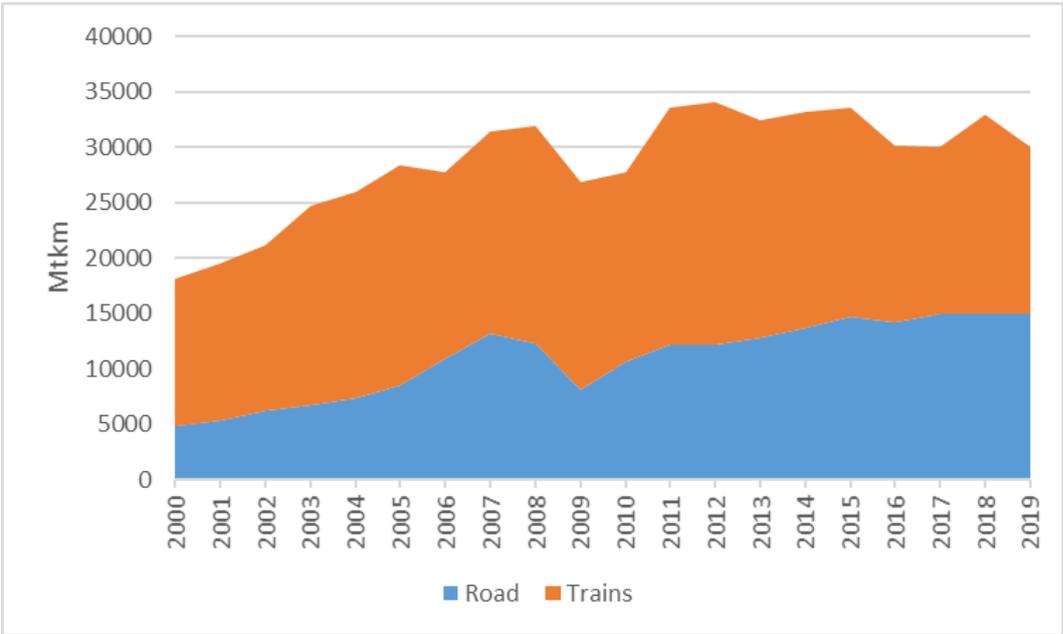
Figure 17 Passenger travel by transport mode



Source: ODYSSEE database

Figure 18 shows that freight traffic increased by around 78% in the period 2000-2019. This trend was mainly driven by the growth of road transport (167%) which by far exceeded the increase in rail freight traffic (46.7%). It has to be noted that the volume of rail freight strongly depends on the export shipment volumes in the harbours of Latvia.

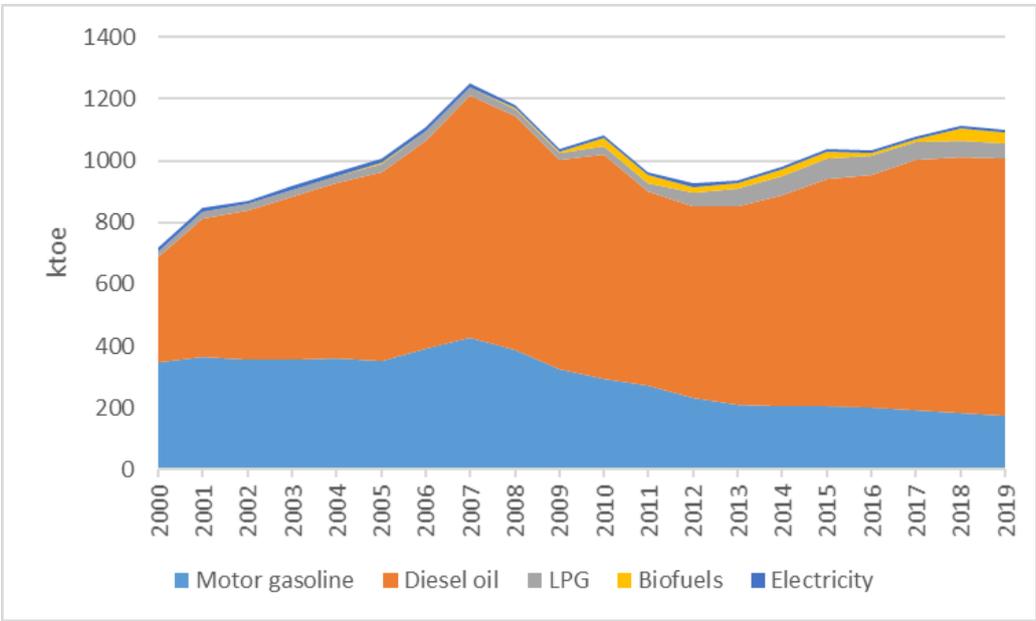
Figure 18 Freight traffic by transport mode



Source: ODYSSEE database

In the transport sector the final energy consumption increased by 31%. Most of this increase is contributed to by energy consumption in road transport (32%) while fuel consumption in railway transport increased by 10% in the period under consideration (see Figure 19).

Figure 19 Energy consumption in the transport sector

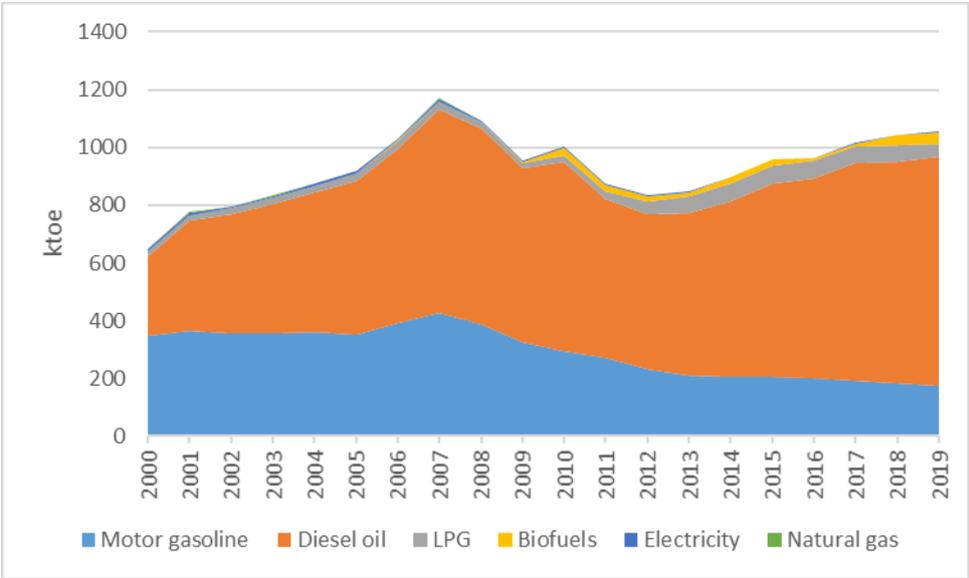


Source: ODYSSEE database

In the period 2000-2019 not only the total fuel consumption in road transport increased, but the total consumption was also impacted by different kinds of vehicles. The greatest changes referred to fuel

consumption by light duty vehicles (LDV) the share of which increased from 6.6% in the year 2000 to 11.3% in 2019. The share of passenger cars in the total fuel consumption increased from 51% to 57%, but the share of heavy duty vehicles (HDV) and buses decreased by 11% points and was 31% in the year 2019.

Figure 20 Fuel consumption in road transport, 2000 - 2019

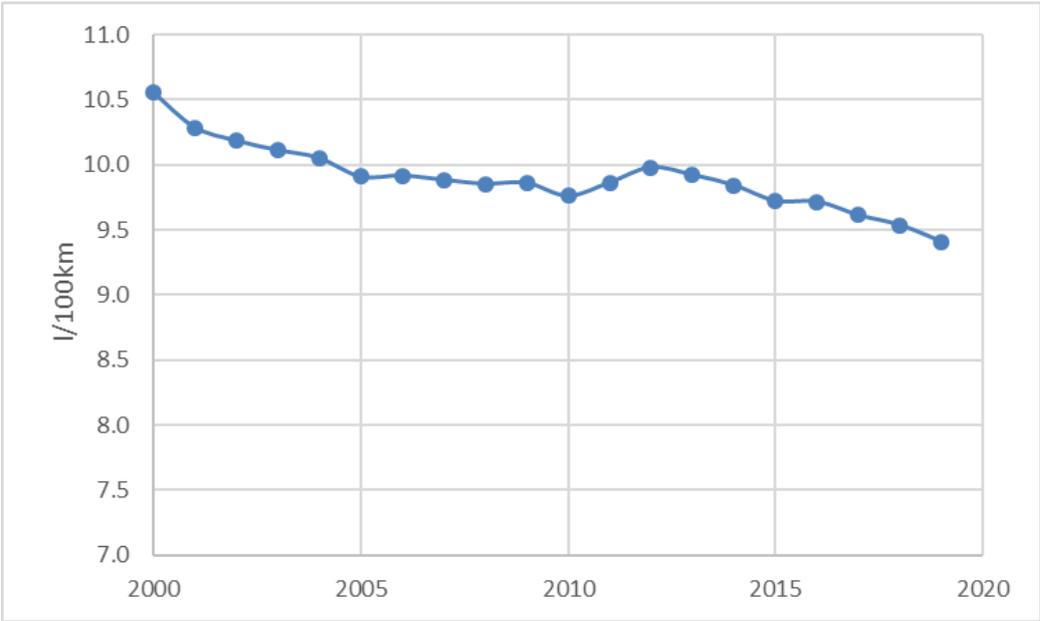


Source: ODYSSEE database

There was not only a rapid growth in the total number of passenger cars, but also important changes in their age structure – there was a rapid increase in the number of new motor vehicles. Due to that reduction was possible of specific fuel consumption per unit (l/100 km) for passenger cars by 10.2% in the period under consideration (see

Figure 21).

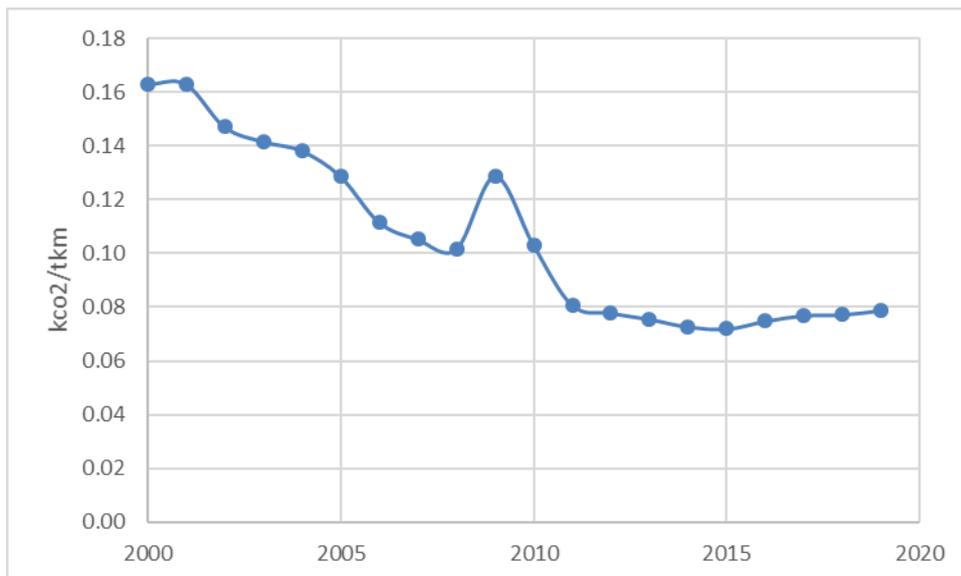
Figure 21 Average specific fuel consumption of cars, 2000 - 2019



Source: ODYSSEE database

Even greater reduction of specific emissions (kCO₂/tkm) was observed in road goods transport (see [Figure 22](#)). In 2019 the value indicator decreased by 46% in comparison with 2000. It should be noted that this decrease was not only due to driving newer cars, namely, technological improvements, but also due to improvements in freight transport logistics. It was most obvious in the period of economic recession (2008-2010).

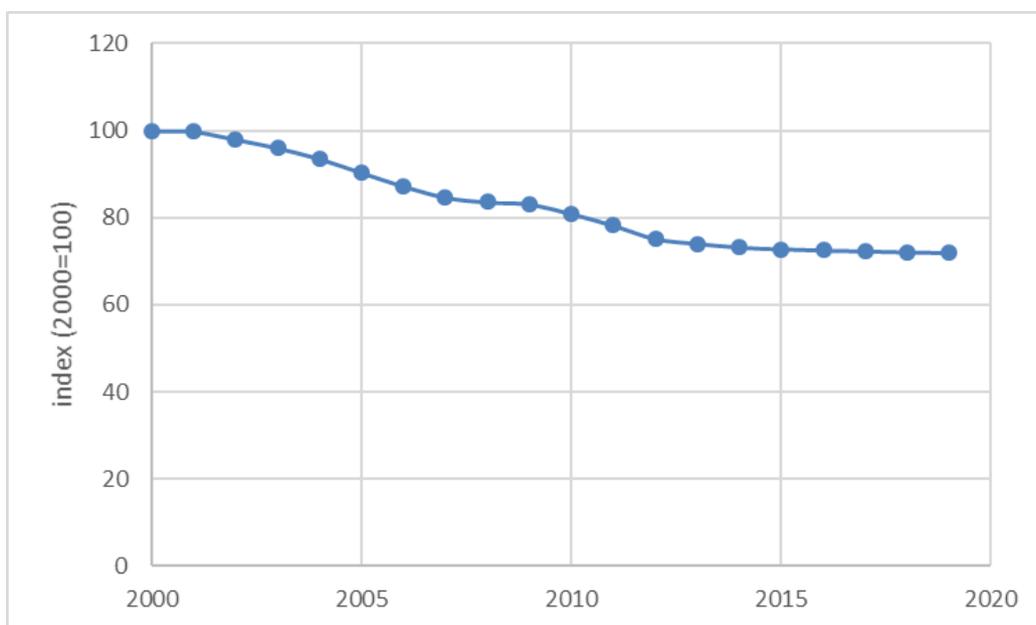
Figure 22 Specific CO₂ emissions for road goods transport



Source: ODYSSEE database

The above described positive trends in the index changes characterizing different vehicles determined the improvement of the total energy efficiency index of the transport sector (see Figure 23). Energy efficiency improved by around 31%.

Figure 23 Energy efficiency index (technical ODEX) of the transport sector



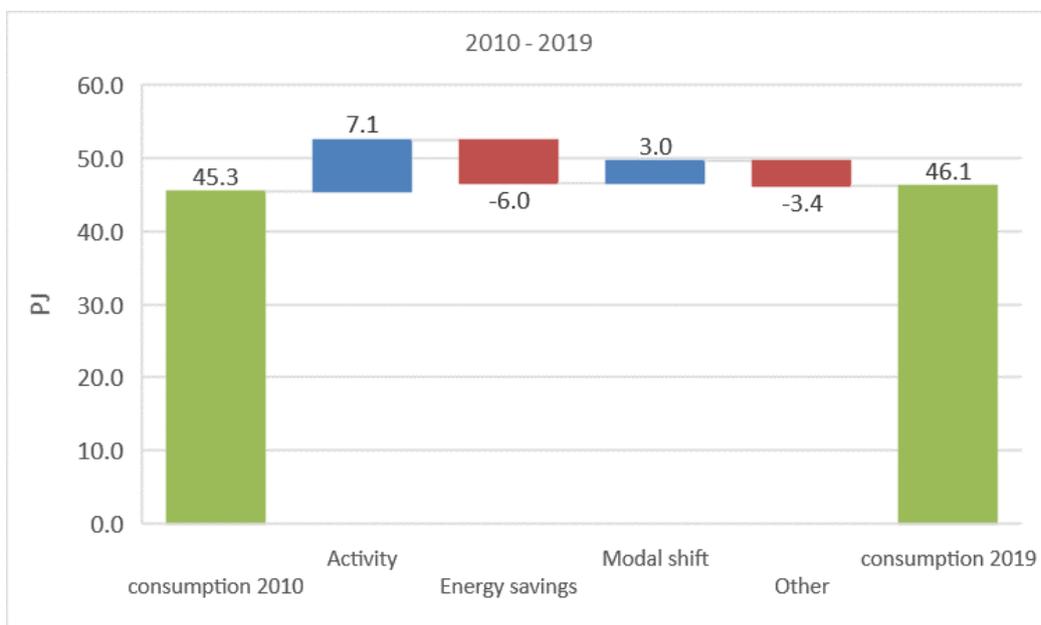
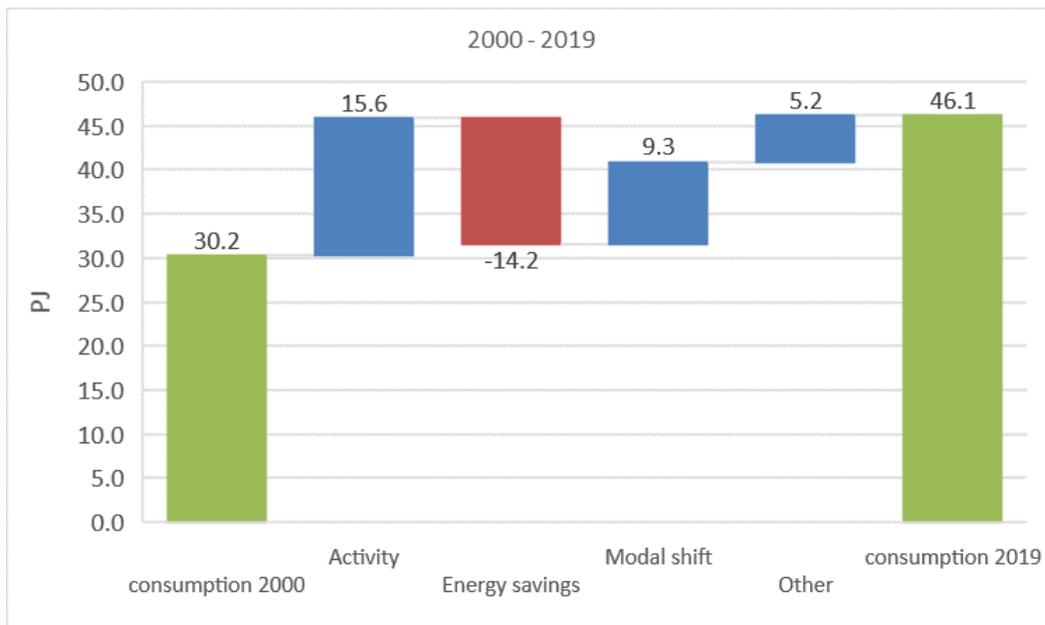
Source: ODYSSEE database

Analysing the impacting factors upon the changes in the energy consumption of freight transport (2000-2019), a conclusion may be drawn that irrespective of fairly great activity growth (transported cargo, tkm) and the negative impact of modal shift (shift from railway to road transport) energy

savings due to improving energy efficiency resulted in inconsiderable change in the energy consumption (see

Figure 24).

Figure 24 Decomposition of final energy consumption in the transport sector for the periods 2000-2019 and 2010-2019



Source: ODYSSEE database

B. ENERGY EFFICIENCY POLICIES

3.2.1. Energy efficiency policies of National Energy and Climate Plan 2021-2030 (NECP2030)

The NECP2030 envisaged state in 2030 is as follows:

- more extensive use of public transport services and reduced use of private vehicles, particularly in urban areas;
- more efficient energy use and an increase in the share of zero-emission energy, particularly alternative fuels;
- lower oil imports and higher consumption of RES produced in Latvia in transport.

The key actions of NECP2030 in the building sector includes:

1. reducing the use of private vehicles by optimising the system of public transport and other modes of transport,
2. promoting the use of energy sources alternative to petroleum products,
3. increasing the volume of RES used in vehicles.

A mix of measures is applied: investment, regulations (standards, labelling, public procurement), fiscal, information, education ones.

The following analysis of energy efficiency measures is based on Latvia part of the MURE database. On-going and proposed measures are considered in the analysis. Taking into account the specific of the Transport section, legislative developments are characterised in the description of particular energy efficiency or RES measures.

Energy efficiency measures have been classified according to the following subsets:

- (1) measures aiming at improving the vehicles' energy efficiency; these measures are those concerning standards on energy efficient vehicles and voluntary agreements, mainly addresses cars as well as freight vehicles. Given that there is no car-manufacturing industry in Latvia and therefore, there is little opportunity for influencing the technical development of motor vehicles, this subset is not addressed in Latvia part of MURE database;
- (2) measures aiming at facilitating the purchase of energy efficient clean/low-emissions vehicles ("market transformation") to bring the structural changes of the vehicle fleet; these measures include labeling, financial and fiscal policies as well as public procurement. In this section the information on the measures promoting electromobility is included as well.
- (3) measures aiming at improving the inefficient use of the vehicles, acting on the reduction of traffic congestion (the majority of these measures are implemented at local level), improvement of driving styles, vehicle maintenance and limitation of vehicles speed; in this subset also "social planning" measures are included as well,
- (4) measures aiming at facilitating modal shift for both the passenger and goods modes; these measures include the infrastructural policies as well as financial, fiscal, public procurement and informative initiatives favouring public transport. Measures promoting bicycling are also included. The financial support programmes for clean public transport and municipal transport are presented as well;
- (5) measures related to biofuels promotion are presented in the separate section/

3.2.2. Facilitating the purchase of energy efficient clean vehicles

In this sub-section the relevant facilitating taxation measures, public procurement provisions and electromobility promoting financial programmes are presented.

Taxation measures

Relevant taxation measures include:

- Law on Excise Duties: oil products and natural gas,
- Vehicle (cars and light duty vehicles) Annual Operation Tax based on the specific CO₂ emissions,

- Vehicle (busses and heavy duty vehicles) Annual Operation Tax based on the EURO class.

Law on Excise Duties: oil products and natural gas (see *TRA-LV2271*). The rates of excise duties for oil products have been step-by step raised during the previous years, the current duties are presented in the Table below. From the 1st February 2021 equal tax rate are applied to all biodiesels which are fully produced from biomass as well as to paraffinic diesel produced from biomass (before zero tax rate had been applied for the pure rapeseed biodiesel). To promote the competitiveness of agriculture sector, the reduced tax rate is applied for the diesel (gas oil) which is used for agriculture land cultivation purposes.

To promote natural gas utilising vehicles, the reduced rate for natural gas - 1.91 EUR per MWh – is stated for the period 1st January 2021 -31th December 2025. From the 1st January 2026 tax rate of 10 EUR per MWh will be applied. In 2021 there are three publicly available CNG filling stations.

Table 13 Excise duties for fuels utilised in transport sector

	Duties, EUR per 1000 litres		
	2018-2019	01.01.2020 – 01.02.2021	From 01.02.2021
Unlead gasoline	476	509	509
Unlead gasoline with 70-85% (volume) of bioethanol produced from agriculture origin raw materials	30% of the base rate (if mixed in Latvia or imported from EU member state)		360
Lead gasoline	594	594	594
Diesel oil (including diesel oil with any mix of biodiesel)	372	414	414
Diesel oil utilised in agriculture sector (earmarked amount per ha)	15% of the base rate		
Pure rapeseed biodiesel	0 (if produced in Latvia or imported from EU member state)		330
Another pure biodiesel and paraffinic diesel produced from biomass	372	414	330
Oil gasses and other hydrocarbons (per 1000 kg)	244	285	285
Natural gas (per 1 MWh, highest calorific value)	9.64	9.64	1.91 (01.01.2021- 31.12.2025)
			10 (from 01.01.2026)

Vehicle (cars and light duty vehicles) Annual Operation Tax based on the specific CO₂ emissions (see *TRA-LV2289*)

- **the Amendments** on the Law „**On the Vehicle Operation Tax and Company Car Tax**”, adopted **23th November 2016** and in force from the 1st January 2017, have introduced in Latvia new approach – cars annual taxation based on the specific CO₂ emissions of the car. This approach is applied for the cars registered for the first time after 31th December 2008 (for the cars registered up to 31th December 2016 the new approach is applied from the 1st January 2019).
- **the Amendments on this Law, adopted 30th November 2020** and in force from the 1st January 2021, have extended this approach also to taxation of light duty vehicles with gross weight up to 3500 kg registered for the first time after 31th December 2011.

The tax is not applied for cars and light duty vehicles with the specific CO₂ emissions factor below 50 g CO₂/km. On the other hand, in addition to the basic rate of the vehicle operation tax, the rate in the amount of EUR 300 is determined for those cars and light duty vehicles the engine capacity of which exceeds 3500 cm³. The 2020 Amendments have introduced also the provision that for the vehicle which is in addition equipped with gas-based fuel (LPG) supply, the 90% of the tax rate, presented in the Table, is applied.

The reduction of annual operational tax is based also on social factors : (i) the tax is not applied for one vehicle if the owner of the car is the handicapped person or family which has handicapped child, (ii) 50% tax rate reduction is applied for one car/family car, if the family has the status of multichildren family (three or more under-age children).

The “pure” electric cars is also promoted by that the **reduced Company Car Tax** rate, 10 EUR per month per car, is applied. In its turn, the monthly standard tax rate of Company Car Tax varies from 31 EUR (car’s engine below 2000 cm³) up to 82 EUR (car’s engine above 3000 cm³) per month. Company Car Tax shall be paid in addition to Vehicle Operation Tax in case the certain provisions fulfil.

Table 14 Annual Operation Tax for Cars and Light Duty Vehicle: Tax rates on 1st January 2021, EUR

(A)	Annual Tax rate, on 01.01.2021, in EUR,		Annual Tax rate for cars, on 01.01.2017, in EUR,
	(B)	(C)	
CO ₂ emissions factor per one km	Cars and light duty vehicles registered first time after 31th December 2020	Cars registered first time after 31th December 2008 Light duty vehicles registered first time after 31th December 2011	
Emissions measuring methodology (see the notes)	Worldwide Harmonized Light Vehicles Test Procedure (WLTP)	New European Driving Cycle (NEDC) method	
below 50 g CO ₂ / km	0	0	0
51 – 95 g CO ₂ / km	9	12	12
96 – 115 g CO ₂ / km	36	48	48
116 – 130 g CO ₂ / km	66	84	84
131 – 155 g CO ₂ / km	90	120	120

156 -175 CO ₂ / km	114	144	144
176 – 200 g CO ₂ / km	132	168	168
201 – 225 g CO ₂ / km	168	216	264
226 – 250 g CO ₂ / km	204	264	264
251 – 275 g CO ₂ / km	258	336	408
276 – 300 g CO ₂ / km	318	408	408
301 – 350 g CO ₂ / km	426	552	552
351 – 400 g CO ₂ / km	582	756	756
401 and above g CO ₂ / km	756	756	756
	Additional annual tax rate	Additional annual tax rate	Additional annual tax rate
applied, if engine capacity is above 3500 cm ³	300	300	300
Notes			
1. If the information on vehicle's specific CO ₂ emissions according WLTP is not available, the tax shall be paid according the NEDC method (column C)			
2. If the information on vehicle's specific CO ₂ emissions is not available according both methods, the tax shall be paid depending on vehicle's gross weight, engine capacity and maximum engine power (see the measure <i>TRA-LV2274</i> , the Tables 3-5)			

For the older cars (registered before 2009) the annual operation tax is also differentiated taking into account such criteria as engine capacity, maximal power of engine and the gross weight of the vehicle. For older light duty vehicles (registered before 2011) the annual operational tax rate is based on the gross weight of the vehicle as well as specific technical features. Differentiated annual operation tax based on engine capacity is applied for motorcycles as well (see more details in *TRA-LV2274*).

Vehicle (busses and heavy duty vehicles) Annual Operation Tax based on the EURO class.

The Amendments on the Law „On the Vehicle Operation Tax and Company Car Tax”, adopted 30th November 2020 and in force from the 1st January 2021, have introduced the annual operation tax based on EURO class for:

- buses with gross weight above 3500 kg,
- duty vehicles with gross weight above 3500 kg.

Table 15 Annual Operation Tax for Buses based on EURO class: Tax rates on 1st January 2021, EUR

Gross weight of bus	EURO class			
	EURO 0, EURO I, EURO II	EURO III, EURO IV	EURO V	EURO VI and less polluting
3501 -12000 kg	252	180	120	96
Above 12000 kg	300	210	156	120
Note. For buses with the gross weight up to 3500 kg, the tax rate depends on the gross weight of the buss, see the measure <i>TRA-LV2274</i> , the Table 6.				

Table 16 Annual Operation Tax for Duty vehicles with gross weight 3501-12000 kg: Tax rates on 1st January 2021, EUR

Gross weight of duty vehicle	EURO class			
	EURO 0, EURO 1, EURO 2	EURO III, EURO IV	EURO V	EURO VI and less polluting
3501 -12000 kg	432	300	192	144

Table 17 Annual Operation Tax for Duty vehicles (except tractive units) with gross weight above 12000 kg: Tax rates on 1st January 2021, EUR

	EURO class	number of axles of the vehicle	Tax rate
1	EURO 0, EURO I, EURO II	Not more than 3	420
		Not less than 4	540
2	EURO III, EURO IV	Not more than 3	300
		Not less than 4	390
3	EURO V	Not more than 3	192
		Not less than 4	264
4	EURO VI and less polluting	Not more than 3	156
		Not less than 4	192

Table 18 Annual Operation Tax for Tractive Units: Tax rates on 1st January 2021, EUR

	EURO class	number of axles	Tax rate
1	EURO 0, EURO I, EURO II	Not more than 2	420
		Not less than 3	540
2	EURO III, EURO IV	Not more than 2	300
		Not less than 3	390
3	EURO V	Not more than 2	192
		Not less than 3	276
4	EURO VI and less polluting	Not more than 2	156
		Not less than 3	240

To promote agriculture sector competitiveness, a producer of agricultural products, an agricultural service co-operative society and a recognised aquaculture (pond farm type) farm shall pay the vehicle operation tax for a goods vehicle in the amount of 25%, observing the certain conditions. This relief shall be applicable to one goods vehicle per every 50 hectares of land to be used for agriculture in the ownership, permanent use or lease thereof.

New passenger cars labelling on fuel economy rating provides information regarding fuel consumption (litres per 100 km or km per litre) and CO₂ emissions (grams per km). In July 2004 Cabinet of Ministers Regulation No.608 came into force transposing the requirements of the Directive 2003/73/EC.

Toll Rate for the Use of Motorways (see *TRA-LV279*) was introduced in practice from the 1st July 2014. The purpose of the toll is the maintenance and development of the State and regional motorways, as well as promotion of the utilisation of more environmentally friendly vehicles. The toll shall be paid for the use of the motorway stages by (1) freight transport vehicles the total mass of which is greater than 3000 kg and (2) freight transport vehicles and vehicles compositions the total mass of which is greater

than 3500 kg and which are only intended for the carriage of goods by road¹⁶. The toll rate for the vehicles and vehicles composition having total weight 3501kg and above, is determined depending on the emission level of the vehicle's engine (EURO class) as well as the number of vehicle's axles.

Public procurement

Public procurement (see *TRA-LV2281*). The section 54 of the Public Procurement Law states the general provision: when organising a procurement of road transport vehicles of M and N categories (defined in the EU Regulation 2018/858/EU), the contracting authority shall take into account the impact of their operation on the energy sector and environment and for this purpose shall evaluate at least the energy consumption and the amount of emissions of carbon dioxide, nitrogen oxides, non-methane hydrocarbons, and solid particles.

According with the Annex of the Directive No.2019/1161/EU on the promotion of clean and energy-efficient road transport vehicles (Tables 3 and 4), minimum procurement targets stated for Latvia are as follows:

1. for the share of clean light duty vehicles (LDC) in the total number of LDC covered by contracts – at least 22%, for the period from 2nd August 2021 to 31st December 2030,
2. for the share of clean trucks in the total number of trucks (N2 and N3 categories) covered by contracts – at least 8% for the period from 2nd August 2021 to 31st December 2025 and at least 9% for the period from 1st January 2026 to 31st December 2030.
3. for the share of clean urban buses (UB) in the total number of UB (M3 category) covered by contracts — at least 35% for the period from 2nd August 2021 to 31st December 2025 and at least 50% for the period from 1st January 2026 to 31st December 2030. According the general provisions of the Directive, half of the minimum target for the share of UB has to be fulfilled by procuring zero-emission buses¹⁷.

These targets of the Directive have been transposed in the Public Procurement Law by the Law's Amendments adopted in September 2021 (in force 14th September 2021). Simultaneously the Law on the Procurement of Public Service Providers has been amended as well.

The Latvia's National Energy and Climate Plan 2021-2030 pays important attention to public procurement. The NECP2030 envisages :

- to develop provisions that service providers (particularly municipal communal services and passenger carriers, including taxi) in large cities have the duty to switch/reconstruct their vehicle fleet to electricity and gaseous fuel utilisation ;
- to develop provisions that in large cities on 2030 at least 50% of the energy consumed by city public transport is provided by renewable sources or electricity, on condition that the noted

¹⁶ If the towing vehicle has the total mass above 3500 kg, the duty has to be paid according the rates for the freight transport vehicles compositions. If the towing vehicle has the total mass above 3000 to 3500 kg, the duty has to be paid only for the towing vehicle.

¹⁷ this requirement is lowered to one quarter of the minimum target for the first reference period if more than 80 % of the buses covered by the aggregate of all contracts awarded during that period in a Member State, are double-decker buses.

target has to be revised in case the too high cost burden is put on city's society. The 50% target has to be considered also for inter-urban public transport ;

- to develop provisions for public authorities, both state authorities and municipalities, to switch their vehicle fleet to zero and low emissions vehicles fuelled by alternative fuels, primarily electricity and biomethane ;
- to consider the provisions to limit the public purchase of non-renewables utilising vehicles in large cities (not applicable for operative services transport).

In its turn, the actual framework for the green public procurement is defined by the Section 19 of the Public Procurement Law. According the provisions of the Law, it is adopted the Governmental Regulations No 353 "Requirements of Green Public Procurement and the Procedure They shall be Applied" which have come into force 1st July 2017, Annexes amended in September 2020. According the Regulations, the three groups of the vehicles - (1) cars and light duty vehicles, purchased or on leasing conditions, (2) public transport vehicles and public transport services, (3) waste collection vehicles and services – are included in the list of goods and services for which green procurement provisions and criteria might be applied voluntary (Annex 2 of the Regulation, see more details in *TRA-LV2281*).

Electrovehicles (EV) charging infrastructure development

EU Funds 2014-2020 planning period. Development of country-wide EV charging infrastructure is supported by the ERDF within the framework of the NOP "*Growth and Employment*", Thematic Objective No. 4 "*Supporting the shift towards a low-carbon economy in all sectors*", the Specific Objective 4.4.1. As a result, a single national level fast charging infrastructure coverage - 139 EV direct current fast charging points with capacity up to 50 kW - will be established in 2023 promoting the development of EV market and increase of EVs in road transport (see *TRA-LV2284*). It is planned that the charging stations on TEN-T roads will be in distance of 30 (+/- 10) km, on regional roads – in distance of 50 (+/- 10) km of each other. On the beginning 2021 already 110 fast charging stations have been put into operation. Total public financing assigned is 7.8 MEUR, of which ERDF financing 85% (6.63 MEUR) and state budget financing 15% (1.17 MEUR).

Regarding further development of the charging system covering, the Latvia's National Energy and Climate Plan 2021-2030 envisages:

- (1) by 2030, the number of EV public large capacity fast charging stations to be increased up to 300, including the publicly available charging points established by private investors,
- (2) elaborate criteria and provisions for installation of EV charging point in fuel stations,
- (3) develop provisions for slow or medium speed EV charging points in public parking areas near new and reconstructed buildings (the Plan envisages that up to 50% of enclosed parking spaces will be equipped with charging facilities),
- (4) develop EV charging points of typical capacity in public parking areas near workplaces, shopping centres, cultural centres, municipal and state authorities, public institutions, etc.,
- (5) develop medium capacity (alternative current 7.2-22 kW) EV charging points in public infrastructure,

- (6) support the installation of electrical wiring in multi-apartment residential buildings with enclosed parking spaces for the installation of slow charging stations, as well as medium speed charging if possible.

The Governmental Regulations “Minimum Energy Efficiency Requirements for Existing Buildings”, adopted December 2020, include the provision that on 1st January 2025 public buildings having more than 20 parking places shall have at least one EV charging point.

New financial programmes to support purchase of electrovehicles

New programme for physical persons, 2022-2023. The total amount of support is planned 10 MEUR to be provided during 01.01.2022-31.12.2023. The financing will be provided by the national Emissions Allowances Auctioning Instrument. Grant will be provided both for (1) battery electrical vehicles (BEV) having zero emissions and the minimum mileage is 150 km with a full charge cycle, and (2) plug-in hybrid electrical vehicles (PHEV) having GHG emissions up to 50 g per km and the minimum mileage by electrical power is at least 50 km. It will be supported both new (mileage indicated by odometer is below 500 km) and exploited industrially produced BEV of M1 and N1 category. In its turn, only new industrially produced PHEV of M1 and N1 category will be supported. The amount of grant will be differentiated as follows: (1) purchase of new BEV – 4500 EUR, (2) purchase of exploited BEV and new PHEV – 2250 EUR. Around 3.3 thousand electrical vehicles of M1 and N1 category in total is anticipated to be purchased. When purchasing a new BEV or PHEV, it is also planned to provide support (1000 EUR) for the scrapping of an existing vehicle by handing it over to a treatment company. In addition, the trader merchant - BEV and PHEV seller, must offer the customer a program that has an additional incentive effect of at least 1000 EUR (discount, attractive leasing conditions, maintenance, etc.) as well (see *TRA-LV3891*).

New programme for commercial sector transport. Latvia’s Plan of EU Recovery and Resilience Facility will provide co-financing for acquisition of new zero emission vehicles for this target group. Support will be available for companies to ensure their economic activity as well as for the companies which provide vehicles rental services. Around 22.6 MEUR of financing is allocated. Support intensity (grant) will be available up to 30% of vehicle cost but not more than 10000 EUR per vehicle. It is projected acquisition of 1410 new zero emission vehicles. Support will be available if vehicle’s annual mileage will be at least 30 thousand kilometres (see *TRA-LV3891*).

Loan Programme for Sustainable Mobility. Loans are issued by the State-owned Development Finance Institution “ALTUM”. One of the loans programme areas is sustainable transport. The activities can include, for instance, sustainable mobility, electrical vehicles, biogas-based transport. The main criterion is adequate flow of money – payment of loan due to cost savings. Main conditions of the loan: up to 2.85 MEUR and up to 90% of the project costs, fixed loan rate (4.3%-6.5%) is applied, payback in transport area is 7 years. E.g., using this loan, the electric car-sharing fleet (100 cars) has been established by the Latvian trade mark company “Figy” in July 2020 (see *TRA-LV4197*).

3.2.3. Improving the inefficient use of the vehicles

Mandatory technical inspections of motor vehicles (see *TRA-LV2272*) ensure that only those vehicles that comply with technical and environmental requirements are being allowed to take part in road

transport. The target audience – all groups of motor vehicles' owners. In general, the inspection is annual. To reduce administrative burden for owners of new cars, from the 1st January 2018 it is introduced the provision that first two inspections are performed bi-annually. Namely, a car which have not been registered in Latvia or abroad before shall be subject to the first-time periodic technical inspection not later than 24 months after the relevant vehicle has been registered in Latvia for the first time in conformity with the time period indicated in the permit for the participation in road traffic. The second periodic technical inspection shall be performed not later than 24 months after the first periodic technical inspection. In its turn, subsequent periodic technical inspections shall be performed on an annual basis. Also motorcycles, tricycles, and quadricycles which have not been registered in Latvia or abroad before shall be subject to the first-time periodic technical inspection not later than 24 months after the relevant vehicle has been registered in Latvia for the first time and subsequent periodic technical inspections of the abovementioned vehicles shall be performed on a bi-annual basis. To provide wide and effective controlling of technical state of vehicles, the technical controls of vehicles on the road are provided as well.

In its turn, **public information and education measures** in the transport sector are taken by state institutions on a regular basis. These measures are aimed at collating and disseminating information on different ways in which vehicle users can save petrol (e.g. tyre pressure control, optimal speed choice, driving skills) or use the alternative modes of the transport. These changes are not related to high costs, but mainly concern changes in users' behaviour. Information includes compulsory and voluntary instructions in efficient driving, annual sustainable mobility campaign, etc. Several driving schools provide education and training on energy-efficient driving for vehicle drivers, which undergo either the basic course to obtain a driving licence or any special training courses. Courses are designed for both owners of private vehicles and special business categories, such as drivers of commercial vehicles or buses.

Latvia's National Energy and Climate Plan 2021-2030 foresees introducing the **smart technologies** (traffic signals and changing signs) **for traffic control**. National Operational Programme 2021-2027 envisages 4.35 MEUR total public financing (of which ERDF – 85%) financing for implementation of these technologies.

3.2.4. Facilitating modal shift and favouring public transport

Development of public transport (PT) infrastructure and planning is aimed to increase access to PT, improve the system of PT network, integrate different types of PT and harmonise traffic schedules, improve PT quality, thus motivating certain part of passenger cars' drivers to start using PT.

Development of the infrastructure of environmentally friendly public transport in cities: EU Funds 2014-2020 planning period (see *TRA-LV2285*). Co-financed by the Cohesion Fund within the framework of the National Operational Programme "*Growth and Employment 2014-2020*", aimed to develop more effective urban transport infrastructure promoting the use of PT. Investments are made in accordance with city development plans and will result in at least 20 km new and improved tram lines, purchase of new tram cars and purchase or upgrade of 123 environmentally friendly buses in 2023. Assigned investments: (1) in tram infrastructure in [Riga](#), [Liepaja](#) and [Daugavpils](#) cities, total in all

cities around 142 MEUR, of which Cohesion Fund around 121 MEUR ; (2) in environmentally friendly buses around 52.8 MEUR, of which Cohesion Fund around 44.9 MEUR.

Electricity Tax Law states the exemption for the electricity used for carriage of goods and public carriage of passengers including on rail transport and public transport in towns.

Capital city **Riga and Riga sub-region** plays especially important role due to ~ 50% of total Latvia inhabitants live here. The Latvia's Plan of EU Resilience and Recovery Facility provides wide complex investment for greening transport in the Riga metropolitan area. **This complex reform** (see *TRA-LV4291*) **aims to develop an integrated, environmentally friendly and well-developed public transport system** as well as further develop the bicycling infrastructure. Within the framework of the public transport reform in the Riga metropolitan area, it will be implemented an integrated public transport concept by mid-2023, which will include a route network development plan (railway as the central element), uniform ticket, its price and discount policy, and an integrated timetable for public transport. It is also planned to introduce a single ticket by the end of 2023, as well as real-time passenger information systems. **The total investment of 295.5 MEUR in years 2022-2026** are assigned in the three directions:

- environmentally friendly improvements to the Riga city public transport system - the purchase of 17 electric buses and 7 charging stations, 4 low-floor trams; extension of tram lines; creation of new high-speed public transport line, including also bicycling line; improving public transport access infrastructure of railway stations in Riga area by creating multi-modal points (6 ones of regional significance and 2 ones of local significance), thus the development of five multi-modal passenger transport corridors in Riga metropolitan area will be provided;
- complex improvement of railway electrification in Riga metropolitan area: to provide or improve zero-emission railway infrastructure along 3 railway lines, 7 battery-EMU trains to be purchased which will be used on partially electrified and non-electrified lines in Riga metropolitan area both to replace existing passenger diesel trains as well as to establish new passenger routes on the railway section, where only freight traffic currently takes place;
- it will be developed new bicycle roads of the length of 60.5 kilometers in five major bicycle corridors: Riga– Riga suburbs, each route will provide a link between urban and regional bicycle paths.

In its turn, the National Operational Programme 2021-2027 plans investment of total public financing of around 68 MEUR (of which ERDF financing – 85%) for establishment of multi-modal transporta points and “Park & ride” infrastructure in other cities

The National Operational Programme 2021-2027 plans also investment of total public financing of around 20 MEUR (of which ERDF financing – 85%) for construction of separate bicycle roads (total length 60 km in 2029) along roads and in municipal areas.

The support for zero-emission vehicles to provide municipal functions and services is planned by the funding from the EU Just Transition Fund (JTF). The planned financing by JTF is around **25.4 MEUR**. The purchase of at least 46 zero-emission vehicles is planned.

Latvia's Plan of EU Recovery and Resilience Facility. In the section “Reducing inequalities” (with focus on consequences of 2021 administrative territorial reform) 10 MEUR are allocated to support the

purchase of zero-emission (electrical) school buses to ensure particular municipal function related to education. At least 15 clean buses and related charging equipment will be purchased, investment will be done in years 2023-2025 (see *TRA-LV3890*).

In addition to the noted above 7 battery-EMU, also 32 new efficient EMU trains are being purchased up to 31 December 2023 (see *TRA-LV2288*), thus strengthening the attractiveness of railway as public transport mode.

3.2.5. Biofuels promotion

Biofuels Mix Obligation (see *TRA-LV2278*). To ensure growth of the share of RES in the transport sector, in the 1st October 2009 Latvia had introduced the Biofuel Mix Obligation. The Table below presents the requirements which had been in force from 2018 and the current status, from the 1st January 2020. Mixed biofuels shall correspond to the sustainability criteria. Exemptions are made for: (1) diesels utilised: (i) in case of winter climate, namely, in the period 1st November -1st April, (ii) in sea and avio transport engines ; (2) gasoline utilised: (i) in cars participating in sport competitions, (ii) in avio engines.

Table 19 Biofuel Mix Obligation in Latvia

	01.04.2018-31.12.2019	from 01.01.2020
Bioethanol mix, mandatory for the gasoline of “95” trademark	4.5-5% (volume) of total volume	At least 9.5% (volume) of total volume
Biodiesel mix	(a) 4.5-7% (volume), of total volume, if the biodiesel produced from rapeseed oil, mixed	At least 6.5% (volume) of total volume
	(b) at least 4.5% (volume) of total volume, if the paraffinic diesel, produced from biomass, mixed	

Biomethane utilisation in transport. The Latvia’s National Energy and Climate Plan 2021-2030 (NECP 2030) projects that by 2030 at least 3-5% of final energy in transport sector will be provided by biomethane. Infrastructure development is envisaged - biogas production plants will be equipped to provide biogas purification up to biomethane quality and the plants will either have pipelines for biomethane transport or compression/liquefaction facilities for biomethane. The NECP 2030 envisages the production of biomethane particularly in Agriculture sector (see *TRA-LV4197*). The NOP2021-2027 plans to provide the financial instrument including the grant part. Planned Cohesion Fund financing for the measure ~ 18.5 MEUR.

3.2.6 Measures Impacts Evaluation

In the Table below the several single particular measures are joint in principal groups to discuss their cumulative impact.

Most of Transport Sector measures are evaluated as having the medium impact. The impact of fiscal and informative measures is not assigned as high due to there is no clear direct relationships between the particular measure and the behaviour of drivers. Increasing of tax rates impacts the behaviour of the households with private cars however the real decisions on driving distance and fulfilment of seats in family cars as well as switch to (or partial combination with) public transport are more dependent on the general trends of household income, the system of public transport pricing and in lesser extent on the rate of, e.g., excise duty. The wide programme of greening public transport in Riga metropolitan will only start (in 2022), thus a range of un-certainties regarding results might be still expected.

Table 20 The impact of the selected measures

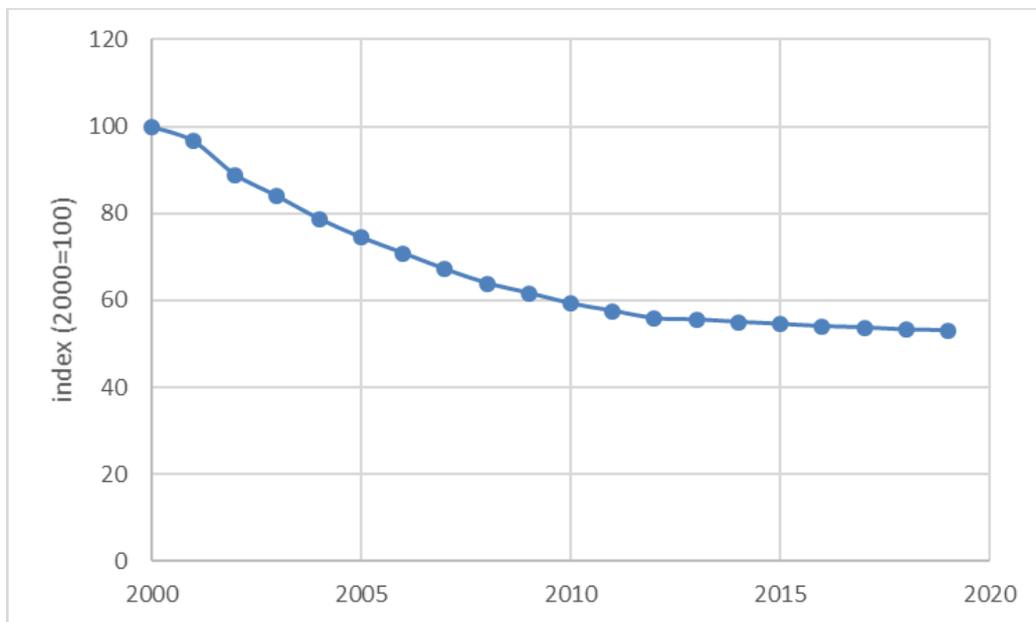
Measures	Expected savings, impact evaluation
Annual operational tax of cars and light duty vehicles based on specific CO2 emissions	Medium
Development of the infrastructure and vehicles of environmentally friendly public transport	Medium
Electromobility Development and promotion of electrovehicles	Medium
Annual operational tax of buses and duty vehicles, with gross weight above 3500 kg, based on EURO class	Medium
Exhaust gas control within the framework of state technical inspection of vehicles	Low

5. ENERGY EFFICIENCY IN INDUSTRY

A. ENERGY EFFICIENCY TRENDS

The industrial value added grew by 39% over the years 2000-2019. The final energy consumption increased by 29% for the same period. In 2019 the energy efficiency index (ODEX calculated at the level of 6 main branches) amounted to 58.1, which means an energy efficiency improvement of almost 42% compared to the base year 2000 (see Figure 25).

Figure 25 Energy efficiency index (technical ODEX) of manufacturing industry, 2000 – 2019



Source: ODYSSEE database

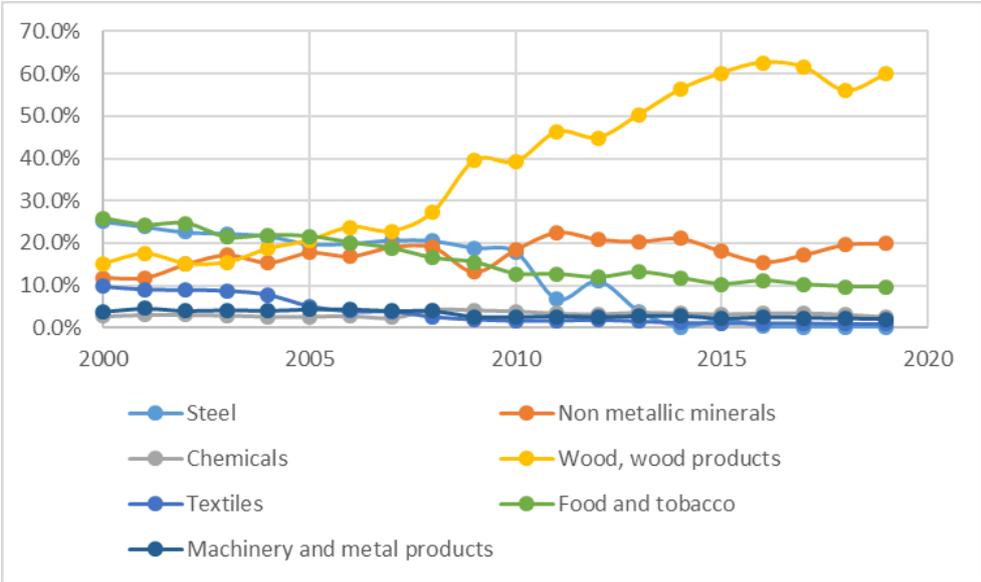
Analysing the contribution of different branches to the total final energy consumption in manufacturing (see Figure 26), significant changes can be seen in the period 2000-2019. The most substantial changes relate to:

- food industry share had decreased from 26% in the year 2000 down to 13% in the year 2019,
- steel industry share had decreased from 25% down to 11%;
- non-metallic minerals share had increased from 12% up to 20%;
- wood processing industry share had increased from 15% up to 50%.

The growth in the contribution of non-metallic minerals and wood processing industry (which together consumed around 70% of the total final energy consumption in manufacturing in the year 2019) indicates the increasing impact of energy intensive branch in Latvia.

At the same time in 2019 the greatest contribution to value added was from the wood industry (21%), food industry (19.7%), machinery and metal industry (18%), non-metallic minerals industry (7.5%) and chemical industry (6%).

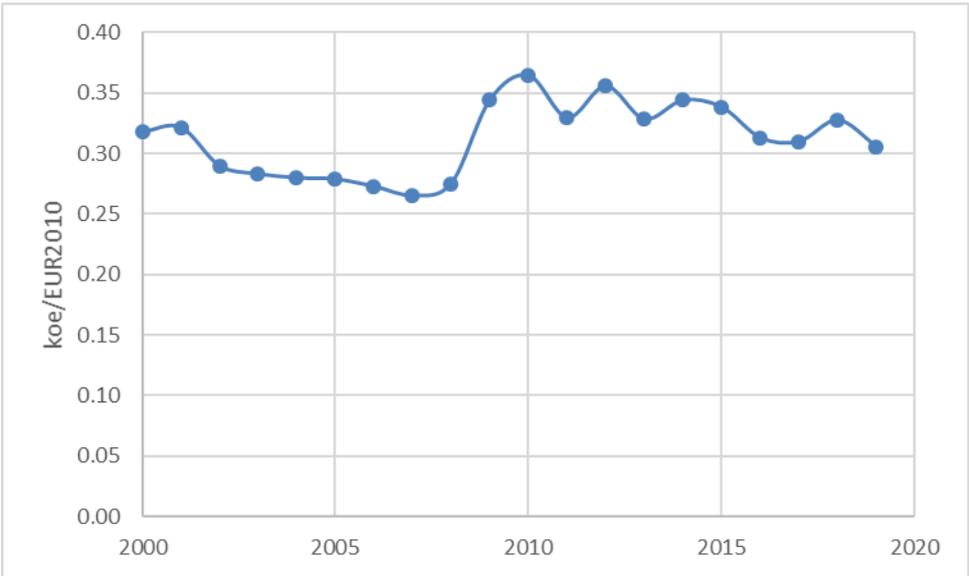
Figure 26 Shares of branches in final energy consumption in manufacturing industry, 2000-2019



Source: ODYSSEE database

In the period 2000-2019 final energy intensity in the manufacturing industry decreased by around 6.5%. The economic crisis negatively impacted the value of energy intensity in manufacturing as in 2008 final energy intensity decreased even by 32% in comparison with the year 2000.

Figure 27 Energy intensity of manufacturing



Source: ODYSSEE database

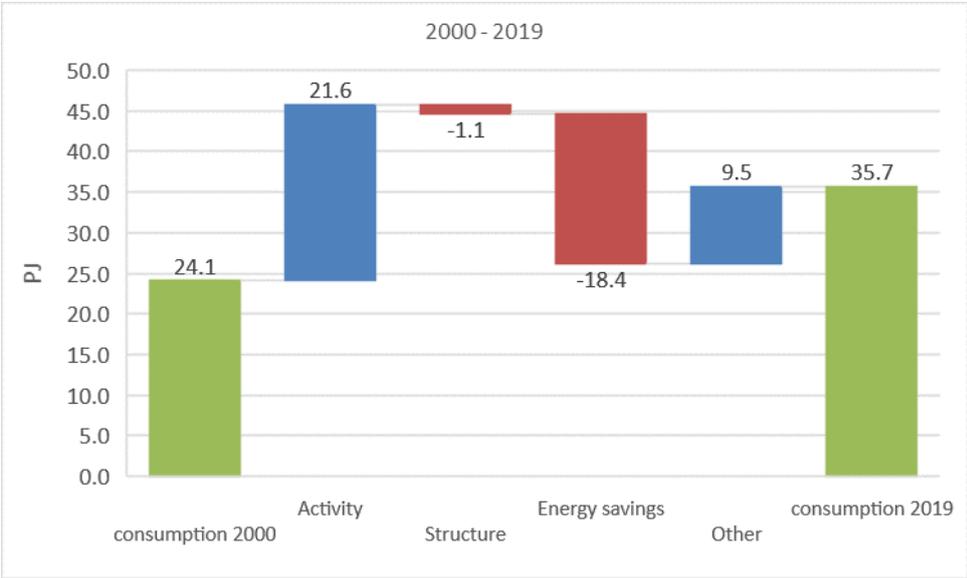
As seen from Figure 27, structural changes in industry did not leave any impact upon the trends in energy intensity as both the graphs exhibit parallel changes.

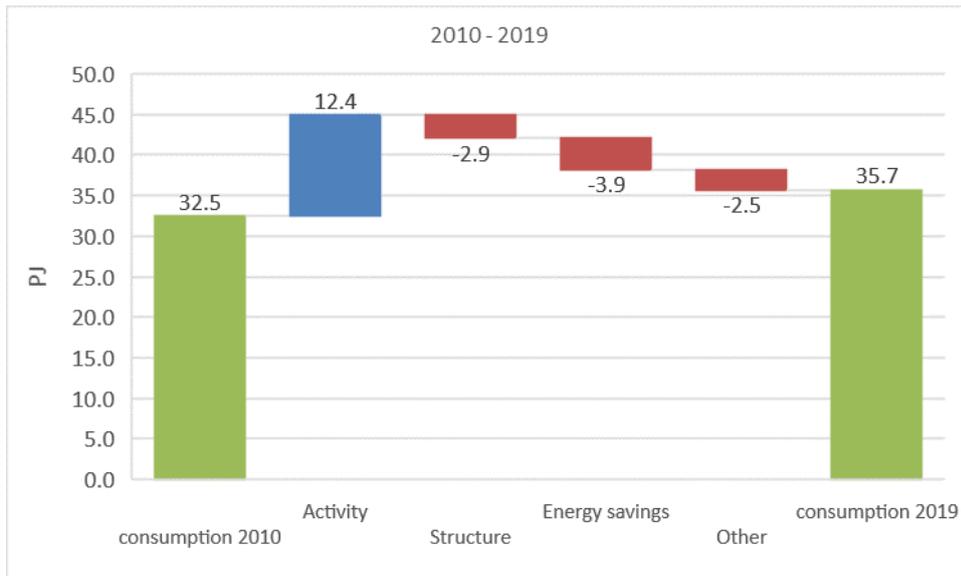
The high-energy intensive branches in Latvia are non-mineral products, the chemical and wood industries; the low energy intensity branches - food, beverage and tobacco, textile and clothing, machinery and equipment. In the period from 2000 to 2019, energy intensity decreased least of all in the non-metallic minerals branch, only for around 10%. In other manufacturing branches intensity decreased considerably more e.g. in the food branch by 50%, transport equipment branch by 42%, chemical branch by 35%, but in the machinery branch even by 70%.

In all of the reviewed manufacturing branches, except food production, the scope of production is highly dependent on external demand and conjuncture. A forcible reason for fluctuations is the small scope of Latvian internal market as well. Therefore, fluctuations in the scope of production substantially influence energy intensity.

Figure 28 and **Erreur ! Source du renvoi introuvable.** display a decomposition analysis for industry for the periods 2000 to 2019 and 2010 to 2019 respectively, i.e. before and after the economic crisis. Before the crisis, the increase of the industrial energy consumption was influenced mainly by changes in industrial activity (measured with the value added), while the period following the economic crisis, structural effects were the main driver, followed by other effects (mainly "negative" effects of activity and the value of products). In the latter period, activity effects had a minor role compared to the other mentioned effects.

Figure 28 Decomposition of final energy consumption in the industry for the periods 2000-2019 and 2010-2019





Source: ODYSSEE database

B. ENERGY EFFICIENCY POLICIES

4.2.1. Energy efficiency policies of National Energy and Climate Plan 2021-2030 (NECP2030)

The NECP2030 provides for further active and wide implementation of energy efficiency improvement measures and measures promoting the use of RES in industry and other commercial undertakings, providing for energy efficient production buildings. providing for modernisation of the existing production capacities by installing more energy efficient equipment for production and processes related to production, as well as the organisation of production buildings and areas, including the replacement of internal and external engineering networks and engineering systems in the production area with more energy efficient ones.

The following analysis of energy efficiency measures is based on Latvia part of the MURE database. On-going and proposed measures are considered in the analysis.

A mix of investment co-financing, regulatory, information measures is applied. The state-owned development finance institution wi;; continue to develop complex financing instruments.

In this section Latvia's **energy-environmental taxes** are included as well due to they mostly relates to production and commercial services processes.

4.2.2. Thermotechnics of Industrial Building Envelopes

The Latvian Construction Standard LBN002-15 "Thermotechnics of Building Envelopes" had determined the requirements for industrial buildings as well (see *SER-LV1702*). From the 1st January 2020 the new Latvian Construction Standard LBN002-19 "Thermotechnics of Building Envelopes" is in force (see *SER-LV3874*). The new Construction Standard incorporates directly the energy performance indicators (EPI) for heating (in kWh per m² annually). Thus, there is no necessity to apply the normative values for particular construction elements. Namely, the objective of the maximal U values is to

eliminate the design of unsafe construction elements. The Standard introduces the approach (taking into account high diversity of construction materials and their fast development) that primarily the data of manufacturer should be used and default values defined by the Standard will be used if the manufacturer data are not available. The application of values of thermal bridges can be done based on specific catalogues thus allowing to avoid too general values.

Table 21 Maximum Values of Heat Transmittance Coefficients for the Construction Elements $U_{RN}W/(m^2 \times K)$ and for the Linear Thermal Bridge for Industrial Buildings , $W/(m \times K)$, in force from 01 January 2020, defined by the Latvian Construction Standard LBN002-19

No.	Construction elements	Industrial buildings
1.	Roofs and coverings which are in contact with outdoor air	0.25
2.1	Floors on the ground	0.35
2.2	Floors on the non-heated cellar or floors with the ventilated space under the floor	0.40
3.1	Walls external	0.30
3.2	Walls of traditional log buildings without heat insulation layer in the wall	0.65
4.1	Windows, balcony doors,	1.30
4.2	Outer doors	2.20
5.	Thermal bridges	0.35

4.2.3 Energy Efficiency Audits and Energy Management Systems (EMS)

This is the cross-sectorial measure which relate to commercial companies/enterprises both in Industry, Services and Transport sector. Two categories of commercial companies are obliged:

- large enterprises (in accordance with the EU definition¹⁸),
- large electricity consumers (national definition, annual electricity own consumption is above 500 MWh).

The "Energy Efficiency Law" has been adopted 3rd March 2016. The Law includes Sections 9 & 10 stating the general procedure of energy audits and performance of energy efficiency improving measures in large enterprises and Section 12 stating the general procedure of energy management in

¹⁸ The enterprise is considered as the LE if it employs more than 249 employees, or has annual turnover more than 50 MEUR and annual total balance 43 MEUR.

entities which have large electricity consumption. In July 2016 the Government has adopted the Regulations No 487 “Regulations on Enterprise Energy Audit”, amended in 2018 and 2019.

Energy efficiency audits and Energy Efficiency Improvement in Large Enterprises (LE). The enterprise is stated as the LE, if it fulfils requirements, stated to be LE, in two subsequent years. In its turn, the enterprise is excluded from the list of LEs, if it does not fulfil noted requirements in two subsequent years. After the exclusion from the list of LE, the obligation regarding energy auditing does not apply more, however the enterprise is still obliged to report on annual energy savings for certain time period. The energy audit shall cover at least 90% of the total final energy consumption of the LE. The first energy audit should be performed up to 31 March 2017, or during one year after the inclusion in the list of LEs. The regular audit shall be performed within the time period of 4 years after the previous audit (according the Directive 2012/27/EU this requirement does not apply to the LE which has implemented certified EMS or certified environmental management system if it provide continuous evaluation of energy consumption). Each year the LE shall inform the responsible state authority, supervised by the Ministry of Economics, regarding implemented energy efficiency measures and energy savings reached. This obligation of annual reporting continues for the following time period: (i) four years after the first or current energy audit, (ii) for the period from implementation of certified EMS till end of the EMS system. **The LE shall implement all (if one or two measures stated) or at least three energy efficiency improvement measures which have the highest energy savings or the highest economical return, stated by the first or current energy audit or EMS. For the first audit/EMS these measures should be implemented up to the 1st April 2020** (see IND-LV1227).

Energy Management Systems in Large Electricity Consumers (LEC). The entity is considered as a LEC if its annual electricity consumption is above 500 MWh (only own consumption, the electricity sold to another consumers is not accounted). The noted threshold of 500 MWh has to be fulfilled in 2 subsequent years to consider entity as the LEC, In its turn, the enterprise is excluded from the list of LEC if it does not fulfil noted requirements in two subsequent years, however the enterprise is still obliged to report on annual energy savings for certain time period. In case the entity corresponds to the status of large enterprise, the duties of large enterprise enters. LEC has the duty to implement and maintain certified EMS which shall cover at least 90% of its total final energy consumption. The LEC which have already implemented environmental management system might supplement this system in a way it provide the evaluation of energy consumption. The noted EMS should be implemented up to the 1st April 2018 (or within one year after inclusion in the list of LECs). The alternative to EMS is to perform the regular energy audits, at least each 4 years. The LEC shall inform the responsible state authority, supervised by the Ministry of Economics, regarding implemented EMS Or performed energy audit, and proposed energy efficiency measures. Each year the LEC shall report the implemented energy efficiency measures and energy savings reached. The obligation of annual report continues for the following time period: (i) four years after the first or current energy audit, (ii) for the period from implementation of certified EMS till end of the EMS system. **The LEC shall implement all (if only one or two stated) or at least three energy efficiency measures, which have the highest energy savings or the highest economical return, stated by energy audit or by certified EMS ; for the first audit/EMS these measures should be implemented up to the 1st April 2022** (see IND-LV1228).

4.2.4. Financial instruments

EU Funds planning Period 2014-2020

Manufacturing industry. Development of new, innovative energy-saving technology, measures increasing energy efficiency and share of RES are supported within the framework of the National Operational Programme “Growth and Employment 2014-2020”, Thematic Objective No4 “Supporting the shift towards a low-carbon economy in all sectors”, the Specific Objective 4.1.1. “To promote efficient use of energy resources and reduction in energy consumption in the manufacturing industry sector” co-financed by EU Cohesion Fund. The eligible activities includes : (i) reconstruction or renovation of energy efficiency of production buildings outer constructions, (ii) renovation, reconstruction or installation of buildings’ engineering systems, (iii) improvement of energy efficiency in existing production technologies, (iv) acquisition of energy efficient production technologies to replace existing ones, (v) measures to provide energy efficient auxiliary technologies if they are necessary for production process technologies, (vi) costs of placement and connection of acquired technologies, (vii) installation of efficient lighting in inner premises, (viii) use of highly efficient RES technologies for production of both heat and electricity for own consumption, (ix) use of RES utilising cooling technologies, (x) reconstruction of inner and outer local heat supply and cool supply networks, (xi) recovery of secondary energy from the production processes as well as the costs of preparation of project’s technical documentation, economical calculations, costs of EIA, project’s management and supervision of construction works, etc. The eligible activities vary depending on the tender. The total assigned Cohesion Fund financing is around 23.7 MEUR, private financing of beneficiaries - around 55.4 MEUR, thus total financing around 79 MEUR. The project shall reach the following quantitative indicators: (1) energy efficiency improvement shall be at least 15% after implementation of energy efficiency improvement measures, (2) heat energy consumption for heating of industrial building is not higher than 110 kWh/m²/year (not applicable if only improvements of energy efficiency in production process are implemented), For more details see *IND-LV1223*.

Food Processing industry. The financial support for food processing enterprises is provided within the framework of the Measure 04 “Investments” of the national Rural Development Programme 2014-2020, financially supported by European Agricultural Fund for Rural Development. The total amount of support for investments will constitute ~ 75.6 MEUR, of which around 11.4 MEUR is directly targeted to improvement of energy efficiency (total public+private investment around 28.3 MEUR), other investments may bring energy efficiency improvements indirectly as well. In general at least 20% of energy efficiency improvement, both for buildings and technologies (such as production technologies, lighting, heating & conditioning equipment and others), shall be reach as a result of the project. The support can be used also for implementation of renewable energy technologies in the enterprise - biomass, hydro, solar or wind energy. For more details see *IND-LV1226*.

SME of Manufacturing sector. Co-financing of investments by ERDF is provided to establish new or reconstruct existing production premises and related infrastructure (the purchase of production technologies is outside the scope of the eligible activities) in order to encourage development, economic activity, growth of productivity of SMEs in Manufacturing industry; area – whole Latvia, except capital city Riga. This co-financing is provided within the framework of the National Operational Programme “Growth and Employment 2014-2020”, Thematic Objective No3 “Competitiveness of small and medium-sized enterprises”, the Specific Objective 3.1.1. “Facilitate formation and development of SME’s in particular in manufacturing and RIS3 priority industries”. The total assigned financing for the

programme is around 92.5 MEUR, including ERDF co-financing of 49 MEUR and the private financing of beneficiaries at least 43.5 MEUR (financing for direct energy efficiency improvement not evaluated). For more details see *IND-LV1230*.

EU Funds planning Period 2021-2027

The financing will be provided by both the Latvia’s Plan of EU Recovery and Resilience Facility (RRF) and Latvia’s National Operational Programme for 2021-2027 planning period. For the details see *IND-LV3885*

Latvia’s Plan of EU Recovery and Resilience Facility (RRF Plan) will provide co-financing for the wide range of activities, presented in the Table below. Total public financing for the activities presented in the Table 1 is around 80.5 MEUR. In addition to the noted public financing, the programme implementing institution – state-owned development finance institution ALTUM – will provide financing for loans (maximum amount of loan per company 10 MEUR, to be issued of up to 20 years period) and guarantees. Thus, the total financing of the financial instrument will be around 190 MEUR, of which around 60 MEUR will be grants for the activities presented in the Table, The investment will be done in years 2022-2026. The investment grant is planned to be paid after the project realization and fulfillment of project quantitative criteria regarding energy savings and/or installed RES capacity. As presented in the Table, around 18.5 MEUR of RRF Plan financing directly relates to energy efficiency improvement of buildings, technological equipment and lighting. Including private financing the direct financing of energy efficiency measures will constitute around 45 MEUR.

In addition to the activities, presented in the Table, the Latvia’s RRF Plan also will provide grants for developing innovative products and technologies in 2 directions: (1) energy efficiency (energy efficiency in buildings, energy efficiency in industry, integration of energy systems and management efficiency, smart grids (wireless charging) and other research directions in the field of energy efficiency), (2) Smart energy, engineering systems and transport solutions, including energy production (heat and electricity), alternative fuels, electromobility, and other areas.

Table 22 Activities to be co-financed by Latvia’s RRF Plan for the Industry sector

Activity	Total financing provided by Latvia’s RRF Plan, EUR	Notes
Energy auditing, development of technical – economical evaluations, development of technological schemes and drafts	4 646 840	Support intensity - 85% (not more than 25000 EUR). Will be available for the companies which have not mandatory duty to provide energy auditing.

Implementation of RES technologies: , support is available if at least 90% of the produced energy will be used for company's own consumption.	32 838 546	Support intensity - up to 30%, depends on the size of the company, maximum grant 2 MEUR.
Energy Efficiency improvement in buildings	10 262 046	Support intensity - up to 30%, depends on the energy savings reached, maximum grant 2 MEUR. At least 30% energy efficiency savings within the project.
Implementation of energy efficient equipment (including lighting),	8 209 637	Support intensity - up to 30%, depends on the energy savings reached, maximum grant 2 MEUR.. Support is available for purchase of new equipment, re-placement of existing equipment on condition that energy saving in particular project is at least 25%. For the whole sub-programme the energy saving shall be at least 30%.
Development of new energy efficient equipment and implementation of demo projects,	2 502 049	Support intensity - up to 30%, depends on the energy savings reached. Support is available for testing, prototypes and patents.
Purchase of zero emissions vehicles	22 576 501	See the description in the Transport section

In its turn, **Latvia's National Operational Programme Plan 2021-2027** allocates around 37 MEUR of ERDF co-financing to provide energy efficiency improvement and RES implementation in companies. Investments financed by NOP2027 will start after the RRF Plan and will continue up to 2030 (the split between co-financing of energy efficiency and RES implementation measures is not yet provided).

In addition, it is also planned promotion of business greening (~ 43 MEUR) by funding of Just Transition Fund. Part of these investments might bring energy savings as well.

Loans to improve the energy efficiency of businesses (on-going with further development)

Loans for energy efficiency improvement are actively issued by the State-owned Development Finance Institution "ALTUM". Main conditions of the loan: up to 2.85 MEUR and up to 90% of the project costs; loan payback period is 5-15 years depending on the sector; fixed loan rate, 4.3% - 6.5%, is applied. The main criterion is adequate flow of money - payment of loan due to energy savings. The loan can be received by wide range of interested parties of commercial sector – individual merchants, micro enterprises, SMEs, large enterprises, state and municipalities owned companies. The financed areas are:

- **Energy efficiency** –for instance, energy efficient equipment and electrical appliances, energy recuperation equipment, LED lighting, modernization of heat supply system (at least 5% energy savings shall be reached). Loan payback period 5-7 years;
- **Renewable energy** – solar PV and heat collectors, wind turbines, hydro energy, biomass based heat boilers and combined heat-power equipment. Loan payback period 15 years;
- **Green non-residential buildings.** The following thresholds shall be met: (1) new building shall have heat energy consumption for heating below 40 kWh/m²/ annually, (2) the renovated building shall decrease heat energy consumption at least per 25%. Loan payback period 15 years.

The loan programme is supplemented by both the guarantee programme (for the details see *IND-LV3877*) and grants for energy auditing programme (for the details see *IND-LV3896*).

4.2.5 Fiscal instruments: cross-sectorial, stationary sources

4.2.5.1 Fuels taxation

Excise duty on natural gas.

Articles 6¹& 15¹ of the Law “On Excise Duties”¹⁹ determine the rates of duty for natural gas. Starting from 1st January 2014 the differentiated rates are applied, see Table below.

Table 23 Excise Tax rates for Natural Gas (NG) utilized for energy production

Aim of utilisation of natural gas	Rate, EUR	
	01 January 2014-31 March 2017	from 01 April 2017
Utilised as fuel	17.07 EUR/1000 m ³	1.65 EUR/1 MWh highest calorific value (HCF)
Utilised as fuel to provide (see note 1) (i) industrial production processes as well as other processes related to production, (ii) the operation of technological equipment for agriculture raw materials pre-treatment, (iii) necessary climate condition in the premises of industrial production and agriculture sector’s raw materials pre-treatment (iv) utilised by entities placed in industrial parks	5.65 EUR/1000 m ³	0.55 EUR/1 MWh, HCF
Utilised to provide heating of greenhouses, industrial scale henhouses/sheds and incubators (see note 2)	Exempted	Exempted till 30 April 2020 From the 1 st May 2020 - 0.55 EUR/1 MWh, HCF.

¹⁹ Law “On Excise Duties”: <http://likumi.lv/doc.php?id=81066>

Aim of utilisation of natural gas	Rate, EUR	
	01 January 2014- 31 March 2017	from 01 April 2017
Used for other purposes (not as fuel), utilised in two ways (including processes of chemical reduction, electrolytic and metallurgy processes)	Exempted	
Amount of NG used by the operator of NG transmission, storage and distribution system for the technological needs of NG supply, including losses during supply	Exempted	
Notes: (1) As the industrial production it is stated the production processes which corresponds to the Annex I, part C "Manufacturing industry", chapters 10.-22 and 24-33 of the Regulation No 1893/2006; the agriculture sector raw materials pre-treatment processes corresponds to the Annex I, part A "Agriculture, Forestry and Fishery", section 01.63 of the given Regulation. (2) includes the production processes which corresponds to the Annex I, part A, sections 01.13, 01.19, 01.25, 01.28, 01.47		

Excise duty on oil products.

Articles 5&14 of the **Law "On Excise Duties"** determine the rates of duty for **mineral oils** and their substitutes. The actual rates are: (i) residual fuel oil – 15.65 EUR/ton, (2) kerosene, diesel (gas oil) – 56.91 EUR/1000 litres, if used for energy production. From the 1st July 2021 the tax rate for kerosene, diesel (gas oil) is increased up to 60 EUR/1000 litres. The exempt is made for the oil products utilised for electricity production and for production in CHP mode. The oil gasses and other hydrocarbons if utilised by private persons as fuel or in gas furnaces (not as the transport fuel) is exempted from the duty as well. In general, the duty pays rather minor role due to minor use of oil products in stationary combustion technologies in Latvia.

Duty on coal, coke and lignite (brown coal)

The procedure of taxation applicable for coal, coke and lignite is prescribed by the **Natural Resources Tax Law**. In year 2018 the rate was 0.36 EUR/GJ or 10.25 EUR/ton if information of specific heating value of coal was not available. In year 2019 the rate was respectively 0.38 EUR/GJ or 10.65 EUR/ton. The actual rate (from 01.01.2020) is 0.76 EUR/GJ or 21.3 EUR/ ton if information of specific heating value of coal is not available. Up to 31th December 2019 zero tax rate had been stated for coal, coke and lignite utilised for electricity production and in CHP mode. However this duty pays a minor role due to very minor coal use in stationary combustion technologies in Latvia.

4.2.5.2 Electricity taxation

The procedure is prescribed by the **Electricity Tax Law**. The rate is 1.01 EUR/MWh. It shall be taxable electricity supplied to an end user, as well as electricity, which is supplied for own consumption, except for the cases specified in the Law. Tax shall apply to entities who are engaged in the generation, distribution, supply, selling of electricity as well as purchasing electricity in spot exchange. The exemption applies for the autonomous producers, who generate and consume electricity for their own needs and fulfil the following requirements: the total generation capacity does not exceed 2 MW, and energy resources taxable with excise duty, coal taxable with the nature resource tax or electricity taxable with the electricity tax is used for the generation of the electricity. The exemptions/zero rate is applied to (i) household users, (ii) street lighting services.

4.2.5.3 Emissions taxation

The procedure of CO₂ emissions taxation is prescribed by the **Natural Resources Tax Law**. The CO₂ tax shall not be paid (1) by the installation participating in the EU Emissions Trading Scheme; (2) for the emission of CO₂ which emerges while using renewable energy resources. Taxation on noxious air polluting emissions creates synergy with CO₂ taxation.

Table 24 Previous (2015-2020), Actual and Future Rates of Natural Resources Tax for CO₂ and noxious air polluting emissions, EUR/ ton

	01.01.2015 – 31.12.2016	01.01.2017 – 31.12.2019	01.01.2020 – 31.12.2020	01.01.2021 – 31.12.2021	01.01.2022 – 31.12.2022	From 01.01.2023
CO₂ emission (see exemptions)	3.5	4.5	9	12	15	15
particles PM ₁₀	75.00	75	75	105	120	135
CO	7.83	7.83	7.83	7.83	7.83	7.83
NH ₃ , H ₂ S and other non- organic compounds	18.50	18.50	18.50	50	70	90
SO ₂ , nitrogen oxide (NO _x – nitrogen oxide sum, recalculated to NO ₂)	85.37	85.37	85.37	125	140	160
Volatile organic compounds and other hydrocarbons (C _n H _m)	85.37	85.37	85.37	85.37	85.37	85.37
Heavy metals and vanadium pentoxide	1138.30	1138.30	1138.30	1138.30	1138.30	1138.30
Note: Heavy metals (Cd, Ni, Sn, Hg, Pb, Zn, Cr, As, Se, Cu) and compounds thereof, recalculated for the relevant metal, and vanadium pentoxide recalculated to vanadium						

4.2.6. Measures Impacts Evaluation

Table 25 The impact of the selected measures

Measures	Expected savings, impact evaluation
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Energy Audits (EA) and Energy Efficiency Improvement in Large Enterprises	High
Energy Management Systems (EMS) in Entities (Merchants) - Large Electricity Consumers	Medium
Efficient use of energy resources, reduction of energy consumption and transfer to RES in manufacturing industry	High
Investments to Improve Energy Efficiency (EE) in Food Processing Enterprises	Medium
ALTUM loans programmes	High
Energy efficiency improvement within the complex investment co-financing programme for SME's.	Medium

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CMR No 227 (2016) "Regulations regarding the Implementation of the 1st Open Tender of the 3.1.1 Specific Objective's "Facilitate formation and development of SME's in particular in manufacturing and RIS3 priority

industries” 3.1.1.5 Activity “Support for investments in production premises and infrastructure establishment or reconstruction” of the Operational Programme “Growth and Employment” (*Ministru kabineta noteikumi Nr. 227 “Darbības programmas “Izaugsme un nodarbinātība” 3.1.1. specifiskā atbalsta mērķa “Sekmēt MVK izveidi un attīstību, īpaši apstrādes rūpniecībā un RIS3 prioritārajās nozarēs” 3.1.1.5. pasākuma “Atbalsts ieguldījumiem ražošanas telpu un infrastruktūras izveidei vai rekonstrukcijai” pirmās projektu iesniegumu atlases kārtas īstenošanas noteikumi*”), consolidated version: <https://likumi.lv/ta/id/281590>

CMR No 612 (2018) “Regulations regarding the Implementation of the 2nd Open Tender of the 3.1.1 Specific Objective’s “Facilitate formation and development of SME’s in particular in manufacturing and RIS3 priority industries” 3.1.1.5 Activity “Support for investments in production premises and infrastructure establishment or reconstruction” of the Operational Programme “Growth and Employment” (*Ministru kabineta noteikumi Nr.612 “Darbības programmas “Izaugsme un nodarbinātība” 3.1.1. specifiskā atbalsta mērķa “Sekmēt MVK izveidi un attīstību, īpaši apstrādes rūpniecībā un RIS3 prioritārajās nozarēs” 3.1.1.5. pasākuma “Atbalsts ieguldījumiem ražošanas telpu un infrastruktūras izveidei vai rekonstrukcijai” otrās projektu iesniegumu atlases kārtas īstenošanas noteikumi*”), consolidated version: <https://likumi.lv/ta/id/302138>

CMR No243 (2016) “Regulations Regarding the Energy Efficiency Requirements for District Heating Systems in the Possession of a Licensed or Registered Energy Supply Merchant and the Procedures for the Conformity Examination Thereof” (*Ministru kabineta Noteikumi Nr 243 “Noteikumi par energoefektivitātes prasībām licencēta vai reģistrēta energoapgādes komersanta valdījumā esošām centralizētām siltumapgādes sistēmām un to atbilstības pārbaudes kārtību*”), <http://www.likumi.lv/doc.php?id=281914>

CMR No332 (2000) “Requirements for Conformity Assessment of Petrol and Diesel Fuel” (*Ministru kabineta Noteikumu Nr.332 “Noteikumi par benzīna un dīzeļdegvielas atbilstības novērtēšanu*”), <https://likumi.lv/ta/id/11217>

CMR No353 (2017) “Requirements of Green Public Procurement and the Procedure They shall be Applied” (*Ministru kabineta Noteikumi Nr.353 “Prasības zaļajam publiskajam iepirkumam un to piemērošanas kārtība*”), actual consolidated version <https://likumi.lv/ta/id/291867>

CMR No410 (30th June 2020) “Amendments to the Cabinet of Ministers Regulation No 95 (2018) ” Regulations Regarding the State Assistance in Purchase or Construction of Residential Space”, <https://likumi.lv/ta/id/315787>

CMR No 418 (2018) “The regulation of the open tender "GHG emissions reduction by developing energy efficient self-contained buildings", funded by the Emissions Allowances Auction Instrument (*Ministru kabineta noteikumi Nr. 418 “Emisijas kvotu izsolīšanas instrumenta finansēto projektu atklāta konkursa “Siltumnīcefekta gāzu emisiju samazināšana attīstot enerģētiski pašpietiekamu ēku būvniecību” nolikums*”), consolidated version <https://likumi.lv/ta/id/300500>

CMR No 467 (2020) “Regulations regarding Implementation of the Operational Programme’s “Growth and Employment” Measure 4.5.1.1. “To Develop the Infrastructure of Environmentally Friendly Public Transport (Rail Transport)”: (*Ministru kabineta Noteikumi Nr. “Darbības programmas “Izaugsme un nodarbinātība” 4.5.1. specifiskā atbalsta mērķa “Attīstīt videi draudzīgu sabiedriskā transporta infrastruktūru” 4.5.1.1. pasākuma “Attīstīt videi draudzīgu sabiedriskā transporta infrastruktūru (sliežu transporta)” īstenošanas noteikumi*”), <http://likumi.lv/doc.php?id=316400>

CMR No 534 (2016) “Regulations regarding the 4.2.1. Specific Objective “To Facilitate the Increase of Energy Efficiency in Public and Residential Buildings” of the Operational Programme “Growth and Employment 2014-2020”: the First Tender of the Measure 4.2.1.2 “To Facilitate the Increase of Energy Efficiency in State Public

Buildings” (*Ministru Kabineta Noteikumi Nr 534 “Darbības programmas “Izaugsme un nodarbinātība” 4.2.1 specifiskā atbalsta mērķa “Veicināt energoefektivitātes paaugstināšanu valsts un dzīvojamās ēkās” 4.2.1.2. pasākuma “Veicināt energoefektivitātes paaugstināšanu valsts ēkās” pirmās projektu iesnieguma kārtas īstenošanas noteikumi*), actual consolidated version <http://likumi.lv/ta/id/284333>

CMR No 13 (2018) “Regulations regarding the 4.2.1. Specific Objective “To Facilitate the Increase of Energy Efficiency in Public and Residential Buildings” of the Operational Programme “Growth and Employment 2014-2020”: the Second Tender of the Measure 4.2.1.2 “To Facilitate the Increase of Energy Efficiency in State Public Buildings” (*Ministru Kabineta Noteikumi Nr 13 “Darbības programmas “Izaugsme un nodarbinātība” 4.2.1 specifiskā atbalsta mērķa “Veicināt energoefektivitātes paaugstināšanu valsts un dzīvojamās ēkās” 4.2.1.2. pasākuma “Veicināt energoefektivitātes paaugstināšanu valsts ēkās” otrās projektu iesniegumu kārtas īstenošanas noteikumi*), actual consolidated version <http://likumi.lv/ta/id/296336>

CMR No 590 (2016) “Regulations regarding the 1st Tender of the 4.1.1. Specific Objective “To Promote Efficient Use of Energy Resources, Reduction in Energy Consumption and Transfer to Renewable Energy Sources in the Manufacturing industry” of the Operational Programme “Growth and Employment 2014-2020” (*Ministru Kabineta Noteikumi Nr590 “Darbības programmas “Izaugsme un nodarbinātība” 4.1.1 specifiskā atbalsta mērķa “Veicināt efektīvu energoresursu izmantošanu, enerģijas patēriņa samazināšanu un pāreju uz AER apstrādes rūpniecības nozarē” pirmās projektu iesniegumu kārtas īstenošanas noteikumi*), consolidated version <http://likumi.lv/ta/id/284596>

CMR No 38 (2018) “Regulations regarding the 2nd Tender of the 4.1.1. Specific Objective “To Promote Efficient Use of Energy Resources, Reduction in Energy Consumption and Transfer to Renewable Energy Sources in the Manufacturing industry” of the Operational Programme “Growth and Employment 2014-2020” (*Ministru Kabineta Noteikumi Nr38 “Darbības programmas “Izaugsme un nodarbinātība” 4.1.1 specifiskā atbalsta mērķa “Veicināt efektīvu energoresursu izmantošanu, enerģijas patēriņa samazināšanu un pāreju uz AER apstrādes rūpniecības nozarē” otrās projektu iesniegumu kārtas īstenošanas noteikumi*), consolidated version <http://likumi.lv/ta/id/296683>

CMR No 506 (2019) “Regulations regarding the 3rd Tender of the 4.1.1. Specific Objective “To Promote Efficient Use of Energy Resources, Reduction in Energy Consumption and Transfer to Renewable Energy Sources in the Manufacturing industry” of the Operational Programme “Growth and Employment 2014-2020” (*Ministru Kabineta Noteikumi Nr506 “Darbības programmas “Izaugsme un nodarbinātība” 4.1.1 specifiskā atbalsta mērķa “Veicināt efektīvu energoresursu izmantošanu, enerģijas patēriņa samazināšanu un pāreju uz AER apstrādes rūpniecības nozarē” trešās projektu iesniegumu kārtas īstenošanas noteikumi*), consolidated version <http://likumi.lv/ta/id/310544>

CMR No. 637 (03.11.2015) “Regulations regarding the implementation of the Operational Programme’s “Growth and Employment” 4.4.1. Specific Objective “To Develop the Electric Vehicles’ Charging Infrastructure of in Latvia” (*Ministru kabineta Noteikumi Nr.637 “Darbības programmas “Izaugsme un nodarbinātība” 4.4.1. specifiskā atbalsta mērķa “Attīstīt ETL uzlādes infrastruktūru Latvijā” īstenošanas noteikumi*”), actual consolidated version <https://likumi.lv/doc.php?id=277693>

CMR No 730 (10th December 2020) “Minimal Requirements for Existing, in Exploitation, Buildings” (*Ministru Kabineta noteikumi Nr.730 „Ekspluatējamu ēku energoefektivitātes minimālās prasības*), <https://likumi.lv/ta/id/319443>

CMR No 848 (2016) “Regulations regarding Implementation of the Operational Programme’s “Growth and Employment” Measure 4.5.1.2 “Development of Environmentally Friendly Public Transport (Buses) Infrastructure” (*Ministru kabineta Noteikumi Nr. “Darbības programmas “Izaugsme un nodarbinātība” 4.5.1.*

specifiskā atbalsta mērķa "Attīstīt videi draudzīgu sabiedriskā transporta infrastruktūru" 4.5.1.2. pasākuma "Attīstīt videi draudzīgu sabiedriskā transporta infrastruktūru (autobusi)" īstenošanas noteikumi"); actual consolidated version <http://likumi.lv/doc.php?id=287628>

CMR No 876 (2008) "Regulations regarding the Supply and Use of Thermal Energy) (Ministru kabineta noteikumu Nr.876 *Siltumenerģijas piegādes un lietošanas noteikumi*)". Actual consolidated version <http://likumi.lv/doc.php?id=183035>

CMR No 907 (2010) "Regulations Regarding the Survey, Technical Sevicng, Current Repairs and Minimal Requirements for Energy Efficiency of the Residential House": Chapter IV „Requirements for Ensuring the Energy Efficiency of a Residential House” (*Ministru Kabineta Noteikumi Nr.907 „Noteikumi par dzīvojamās mājas apsekošanu, tehnisko apkopi, kārtējo remontu un energoefektivitātes minimālajām prasībām”, IV daļa: Prasības dzīvojamās mājas energoefektivitātes nodrošināšanai*), actual consolidated version <http://www.likumi.lv/doc.php?id=218831>

CMR (draft) "Regulations regarding the open tender "GHG emissions reduction in transport sector – support for purchase of zero and low emissions cars" (Ministru kabineta Noteikumu projekts "*Emisijas kvotu izsolīšanas instrumenta finansēto projektu atklāta konkursa "Siltumnīcefekta gāzu emisijas samazināšana transporta sektorā – atbalsts bezemisiju un mazemisiju transportlīdzekļu iegādei"*) nolikums"), <http://tap.mk.gov.lv/mk/tap/?pid=40507420>