Lithuania's Second Biennial Report

under the United Nations Framework Convention on Climate Change

Vilnius, 2015

Contents

Introduction 3

1. Information on greenhouse gas emissions and trends 3

1.1. Summary information on greenhouse gas emissions and trends 3

1.2. National inventory arrangements 7

2. Quantified Economy-wide Emission Reduction Target (QEERT) 13

3. Progress in achievement of QEERT 15

3.1 Domestic institutional arrangements relating to Lithuania's QEERT 15

3.2. Mitigation actions and progress towards Lithuania's QEERT 17

3.2.1. Climate change management policy in Lithuania *17*

3.2.2. The monitoring and evaluation procedure of the implementation of the policies and measures related to climate change management in Lithuania *18*

3.2.3. Cross-sectorial strategic policies related to climate change mitigation *19*

3.2.4. National Economic and Financial Instruments for Climate Change Management *20*

3.2.5 National policies and measures in different sectors *26*

3.3. Estimation of mitigation measures effects 44

3.4. Information on the assessment of the economic and social consequences of response measures 46

4. Greenhouse gas emission projections 47

4.1. Summary information on greenhouse gas emission projections 47

4.2. Methodology for greenhouse gas emission projections 48

4.2.1. Main assumptions in Energy sector *48*

4.2.2. Main assumptions in Transport sector *50*

4.2.3. Main assumptions in Industrial processes and product use sector *52*

4.2.4. Main assumptions in Agriculture sector *53*

4.2.5. Main assumptions in LULUCF sector *56*

4.2.6. Main assumptions in Waste sector *57*

4.2.7. Analysis of the greenhouse gas emission projections differences between the BR1 and BR2 ..... *61*

5. Provision of financial, technological and capability-building support to developing country Parties 63

References 68

Annex 69

Introduction

Lithuania is pleased to submit its Second Biennial Report (BR2) under the United Nations Framework Convention on Climate Change (hereinafter – UNFCCC).

The Biennial report is elaborated in accordance with the UNFCCC biennial reporting guidelines for developed country Parties (Decision 2/CP.17 of the Conference of the Parties under UNFCCC). As defined in the guidelines the report structure is the following:

- information on greenhouse gas (hereinafter – GHG) emissions and trends;
- quantified economy-wide emission reduction target;
- progress in achievement of quantified economy-wide emission reduction targets;
- greenhouse gas projections;
- provision of financial, technological and capability-building support to developing country Parties.

The EU and Member States are committed to achieve a joint quantified economy-wide emission reduction target – 20% by 2020, compared to 1990 levels. The details of the EU joint target under the UNFCCC are clarified in the document. Additional information related to the quantified economy-wide emission reduction targets presented in the document FCCC/SB/2011/INF.1/Rev.1 (FCCC/AWGLCA/2012/MISC.1).

This biennial report contains summary information on GHG inventory information for the time period 1990–2013, provides summary information on Lithuania's progress made in relation to Lithuania's contribution to the joint EU quantified economy-wide emission reduction target. Summary information on projections until 2030 is also presented. Information provided on GHG and trends is consistent with the information in Lithuania's GHG inventory submission in 2015.

Tabular information to be reported electronically in the Common Tabular Format (CTF) in accordance with "UNFCCC biennial reporting guidelines for developed country Parties" (Decision 19/CP.18 of the Conference of the Parties under UNFCCC) is enclosed to the BR2 submission. It is submitted to the UNFCCC using the CTF software and presented in the Annex.

1. Information on greenhouse gas emissions and trends

Lithuania's efforts on monitoring of current GHG emission levels and projections reporting enable the tracking of emissions at the national level, across different sectors and on different gases. National system that is established for preparation of national GHG emissions inventory capacitates comprehensive, comparable and transparent information which is of great importance in assurance of progress towards the national emission reduction commitments.

This chapter contains summary information on the Lithuania's GHG emissions and emission trends for the period 1990–2013. The GHG data presented in this chapter is consistent with the information provided in Lithuania's GHG inventory submission in 2015.

The chapter presents data on direct greenhouse gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6) and nitrogen trifluoride (NF_3).

1.1. Summary information on greenhouse gas emissions and trends

Total GHG emissions amounted to 19,946.1 kt CO_2 eqv. without LULUCF and 9,982.1 kt CO_2 eqv. including LULUCF in 2013. LULUCF sector is reported for transparency and consistency reasons even though this

sector is not included in the EU's and Member states' pledge under the Convention on Climate Change for pre-2020.

GHG include CO_2, CH_4, N_2O, HFCs, PFCs, SF_6 and NF_3. The emissions of GHG expressed in kt CO_2 eqv. in 2013 decreased by 58.3% comparing to the base year excluding LULUCF and by 77.3% including LULUCF while real Gross Domestic Product (GDP) growth for the 1990–2013 period was approximatively 29% (Statistics Lithuania, Database of gross domestic product, 2014). Figure 1-1 shows the estimated total GHG emissions in CO_2 eqv. from 1990 to 2013.

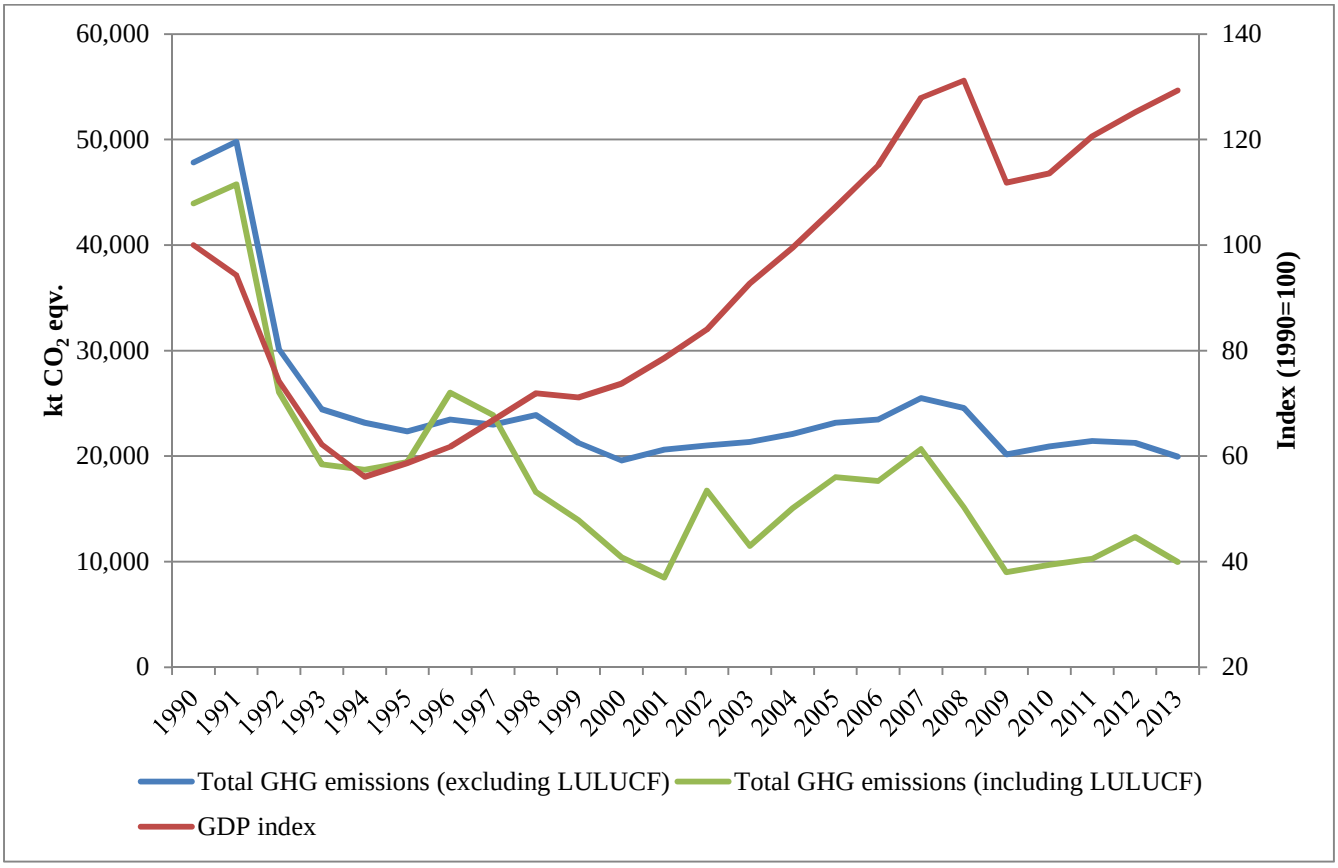

Figure 1-1. Trends for aggregated GHG emissions and changes in GDP index.

GHG emissions trends by gas in CO_2eqv. are presented in the figure below and reflect the main tendencies of GHG level in general.

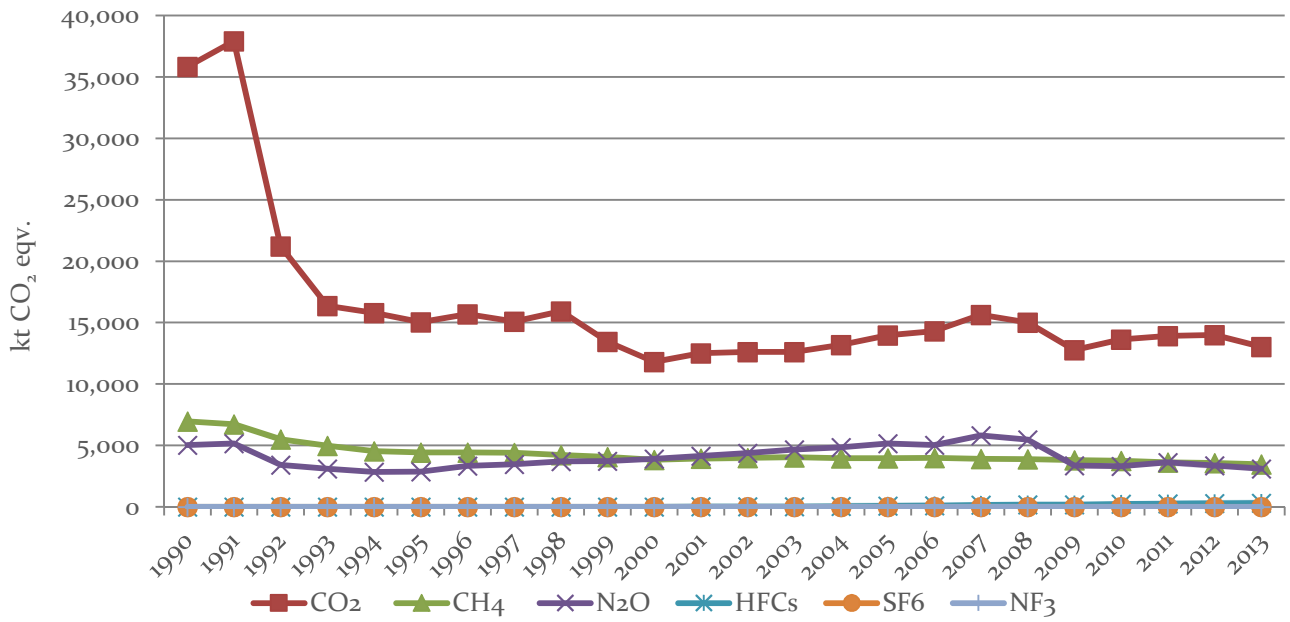

Figure 1-2. Trends of GHG emissions by gas (excl. LULUCF)

The most important GHG in Lithuania is carbon dioxide. The figure below shows the distribution of CO_2 emissions by main sectors and subsectors. In 2013, CO_2 emission (excluding LULUCF) was 2.7 times lower than the emission in 1990. Total CO_2 emissions in 2013 decreased by 7.4% compared to 2012. The biggest source of CO_2 is energy sector, in 2013 total CO_2 emissions from energy sector was 82.2%, transport subsector plays the main role of emitting CO_2 emissions.

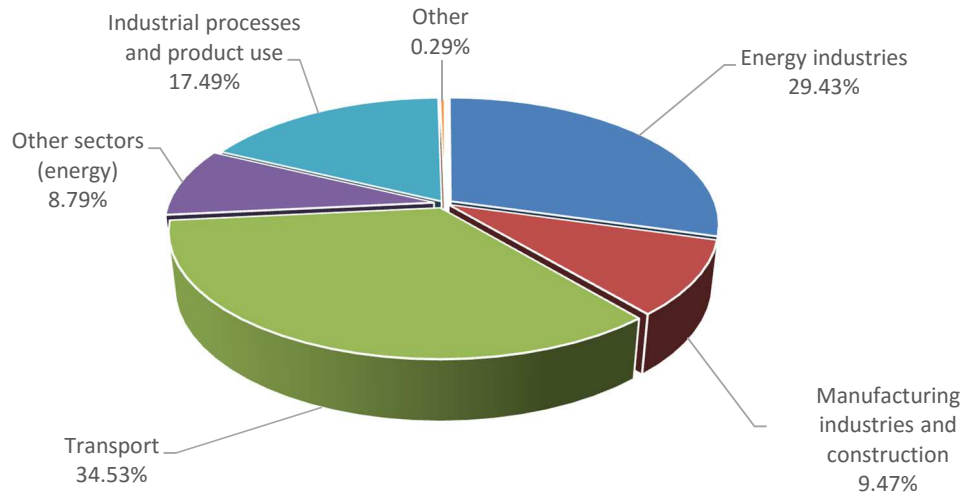

Figure 1-3. Distribution of CO_2 emissions by sectors in 2013

Agriculture sector is responsible for the biggest CH_4 emissions (Figure 1-4). In 2013 emissions from CH_4 from agriculture sector was 52.2%. The second biggest source of CH_4 emissions is waste sector, it contributed 32.5% to total CH_4 emissions. Total CH_4 emissions (excluding LULUCF) in 2013 decreased by 2.8% compared to 2012.

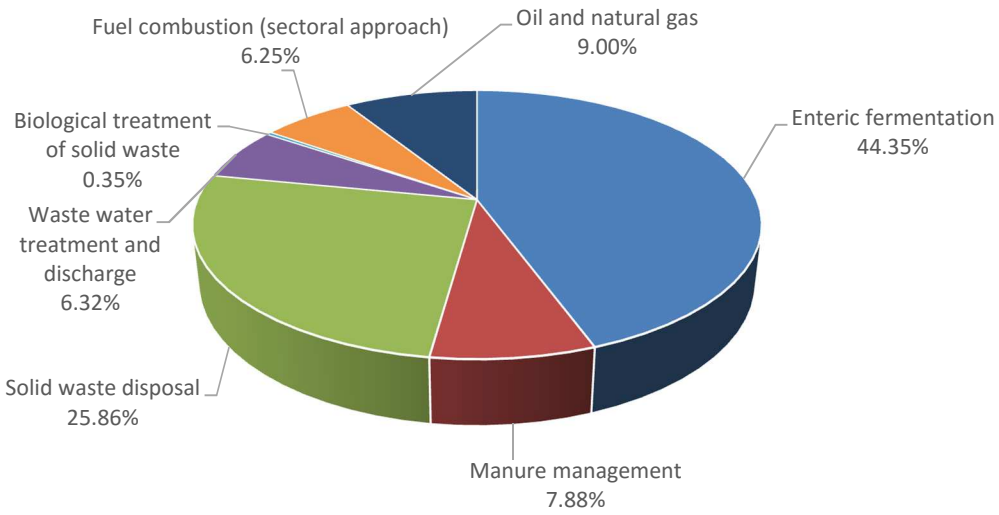

Figure 1-4. Distribution of CH_4 emissions by sectors in 2013

The largest source of N_2O emissions is agriculture sector, in 2013 N_2O emissions from this sector contributed 82.9 % to the total N_2O emissions. The second biggest source of N_2O emissions is chemical industry (nitric acid production) which contributed 10.8% of total N_2O emissions in 2013. Total N_2O emissions (excluding LULUCF) decreased by 8.5% compared to 2012. The figure below shows the distribution of N_2O emissions by sectors and main subsectors.

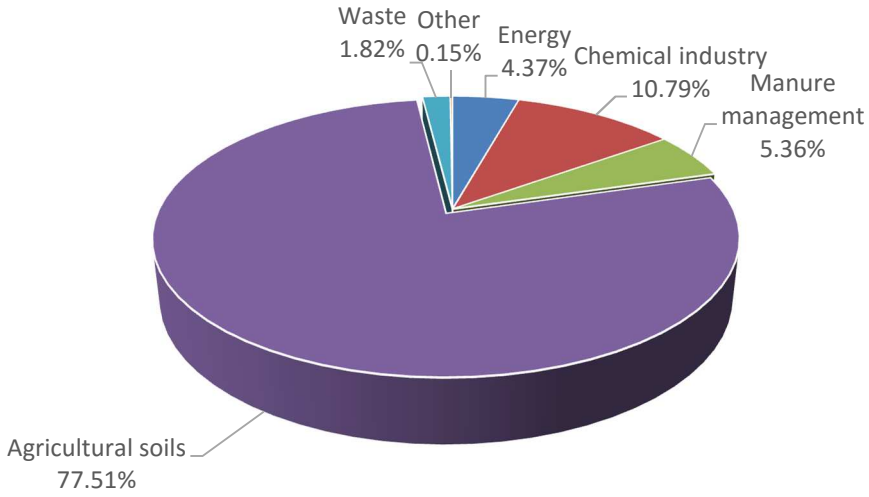

Figure 1-5. Distribution of N_2O emissions by sectors in 2013

The F-gases contribute 1.6 % to the total national GHG emissions. The emissions of F-gases have increased during 1995–2013. A key driver behind the trend has been the substitution of ozone depleting substances (ODS) by F-gases in many applications. Figure below shows the trend of F-gases emissions during the period 1995–2013.

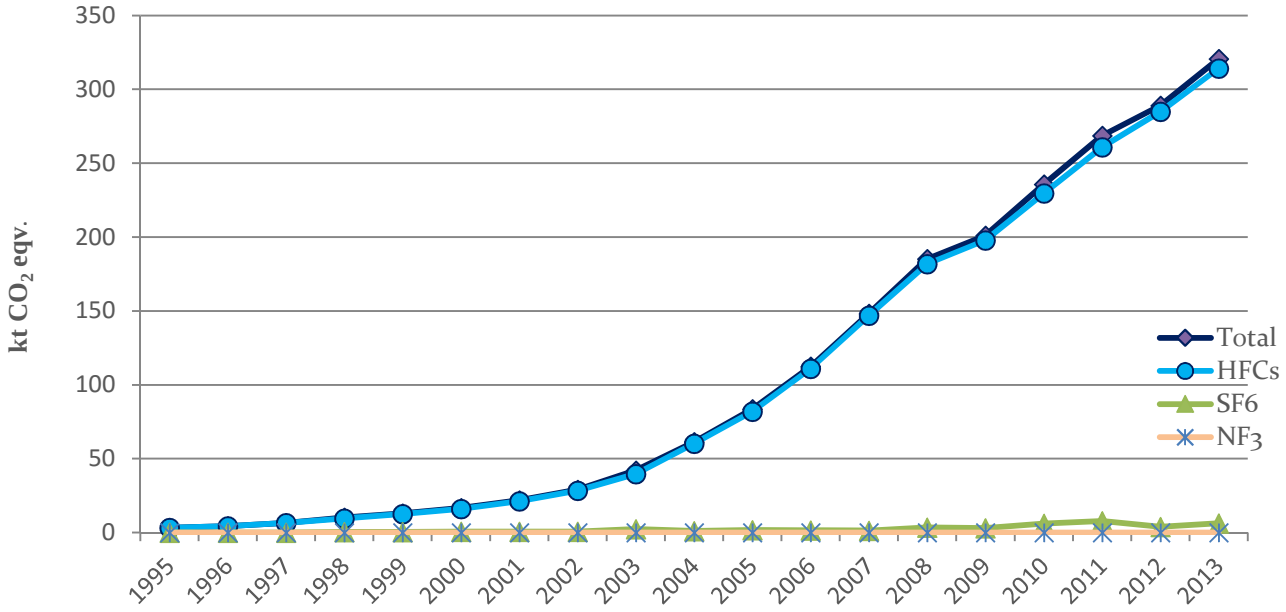

Figure 1-6. Emission trends for F-gases for the period 1995–2013

1.2. National inventory arrangements

Lithuania prepares National Inventory Report (NIR) and CRF tables annually according to the requirements of the UNFCCC, the Kyoto Protocol and the Regulation (EU) No 525/2013 on mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change and repealing Decision No 280/2004/EC. The Ministry of Environment of the Republic of Lithuania is the main managing authority of the Government of the Republic of Lithuania which forms the country's state policy of environmental protection, forestry, use of natural resources, geology and hydrometeorology, territorial planning, construction, provision of residents with housing, utilities and housing, as well as coordinates its implementation. The Ministry of Environment is the main coordinating institution responsible for the development of national climate change management policy that aim at achieving national GHG reduction and adaptation to climate change goals and objectives. It has overall responsibility for the National System of GHG inventory and is in charge of the legal, institutional and procedural arrangements for the national system and the strategic development of the national inventory.

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Detailed institutional set up for GHG inventory preparation is presented in the National Inventory Report 2015 chapter 1.2.1. Basic elements are presented further in this chapter.

The main entities participating in GHG inventory preparation and submission process are:

- Ministry of Environment;
- Environmental Protection Agency;
- Permanent GHG inventory expert working group;

- State Forest Service;
- National Climate Change Committee;
- Data providers;
- External consultants.

Ministry of Environment of the Republic of Lithuania is a National Focal Point to the UNFCCC. The Ministry of Environment is designated as single national entity responsible for the national GHG inventory. It has overall responsibility for the National System of GHG inventory and is in charge of the legal, institutional and procedural arrangements for the national system and the strategic development of the national inventory. Within the Ministry, the Climate Change Policy Division of the Pollution Prevention Department administers this responsibility by supervising the national system. The Division will continue to supervise and coordinate the preparation of the National Inventory Report, including the final review of draft inventory reports. Among its responsibilities are the following:

- overall coordination of GHG inventory process;
- preparation of legal basis necessary for National System functioning;
- an official consideration and approval of GHG inventory;
- approval of QA/QC plan and procedures;
- timely submission of GHG inventory to the UNFCCC Secretariat and the European Commission;
- coordination of the UNFCCC inventory reviews in Lithuania;
- keeping of archive of official submissions to the UNFCCC and the European Commission;
- informing the inventory compilers about relevant requirements for the national system.

In accordance with the Order of Minister of Environment of 22nd of December, 2010 (repeal by the Order of the Minister of Environment No D1-61, 2014), the Environmental Protection Agency (EPA) under the Ministry of Environment was assigned as an institution responsible for the GHG inventory preparation, QA and QC starting from 2011. EPA responsibilities inter alia include monitoring of environmental quality, collection and storage of environmental data and information as well as assessment and forecasting of environmental quality.

The EPA, as the compiler of the GHG inventory, has the following functions and responsibilities:

- development and implementation of QA/QC plan and specific QA/QC procedures;
- identification of data providers for specific information and collection of activity data and emission factors used to calculate emissions;
- cooperate with sectorial experts on the selection of methods complying with IPCC 2006 Guidelines for calculation of emissions giving the priority to key categories and categories with high uncertainty;
- checking and archiving of supplied input data, prepared inventory and used materials;
- key categories analysis;
- overall uncertainty assessment;
- preparation of Common Reporting Format (CRF) tables and compilation of National Inventory Report (NIR);
- maintaining the GHG inventory database;
- providing the final inventory (CRF tables and NIR) for Ministry of Environment;
- evaluating requirements for new data, based on internal and external reviews;
- other activities.

The EPA is responsible for compilation of the final report based on the sectorial information provided by the experts/consultants. Initial data for the sectorial information is provided by the data providers and processed by the experts/consultants. Unprocessed data provided by the data providers are stored in the database before being handed over to experts/consultants for processing. Processed data are also stored in the archive managed by EPA. Composition of the permanent expert working group for the preparation of the National Inventory is shown in Figure 1-8.

The EPA establishes and operates GHG inventory database and archive, where archives of GHG inventory submissions and all supporting reference material is stored and maintained. Backups are prepared on regular basis following the EPA's information management procedures. The archive is managed according to the EPA Director's Order No AV-152 concerning the approval of the National GHG inventory data archiving procedures, adopted on 26 June 2012. The main QA/QC procedures under responsibilities of EPA are performed according to the EPA Director's Order of 23 July 2012 No AV-191 concerning the approval of the National GHG inventory data quality assurance and quality control procedures.

The institutional GHG inventory report preparation and submission set-up is given in Figure 1-7.

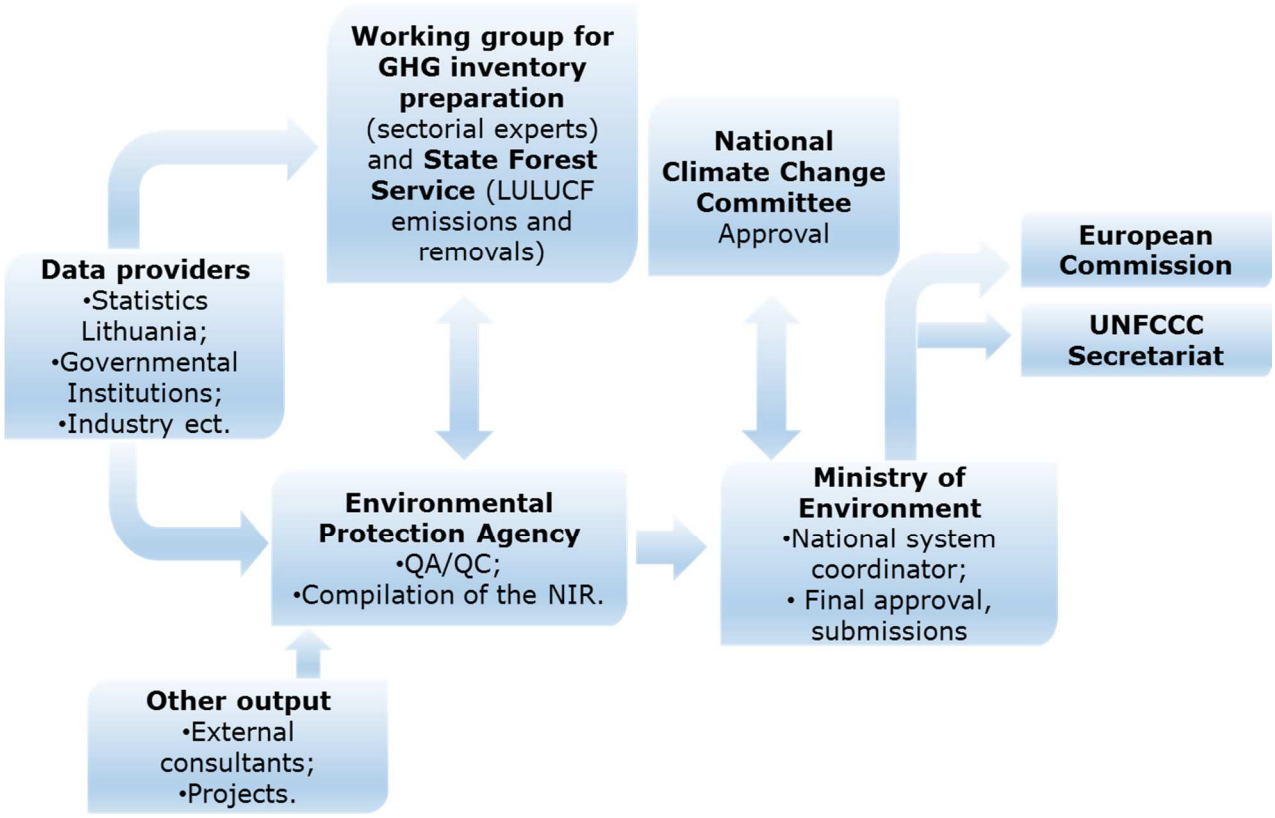

Figure 1-7. Institutional set-up for GHG inventory preparation [1]

The Permanent expert working group for GHG inventory preparation was established in 2012. It consists of experts from the Lithuanian Energy Institute, the Institute of Physics of the Centre for Physical Sciences and Technology, the Institute of Animal Science of the Lithuanian University of Health Sciences, Centre for Environmental Policy, The State Forest Service and University of Applied Sciences. External experts, independent specialists providing data for the GHG inventory, may also be involved during the inventory preparation process.

Functions and responsibilities of the working group for GHG inventory preparation as a whole are defined as follows:

- evaluation of requirements for new data based on internal and external reviews;
- search and identification of specific data providers;
- preparation of requests for new data.
- Identification, on the basis of the IPCC 2006 Guidelines, of methodologies for calculation of GHG emissions setting priority to key categories and categories with high uncertainty level;
- determination of activity data and appropriate emission factors, calculation of emissions;
- application of sector specific QA/QC procedures;
- filling CRF tables for corresponding sectors, drafting relevant NIR sectorial chapters;
- preparation of the answers to the questions and comments received during the EC and UNFCCC reviews;
- other activities.

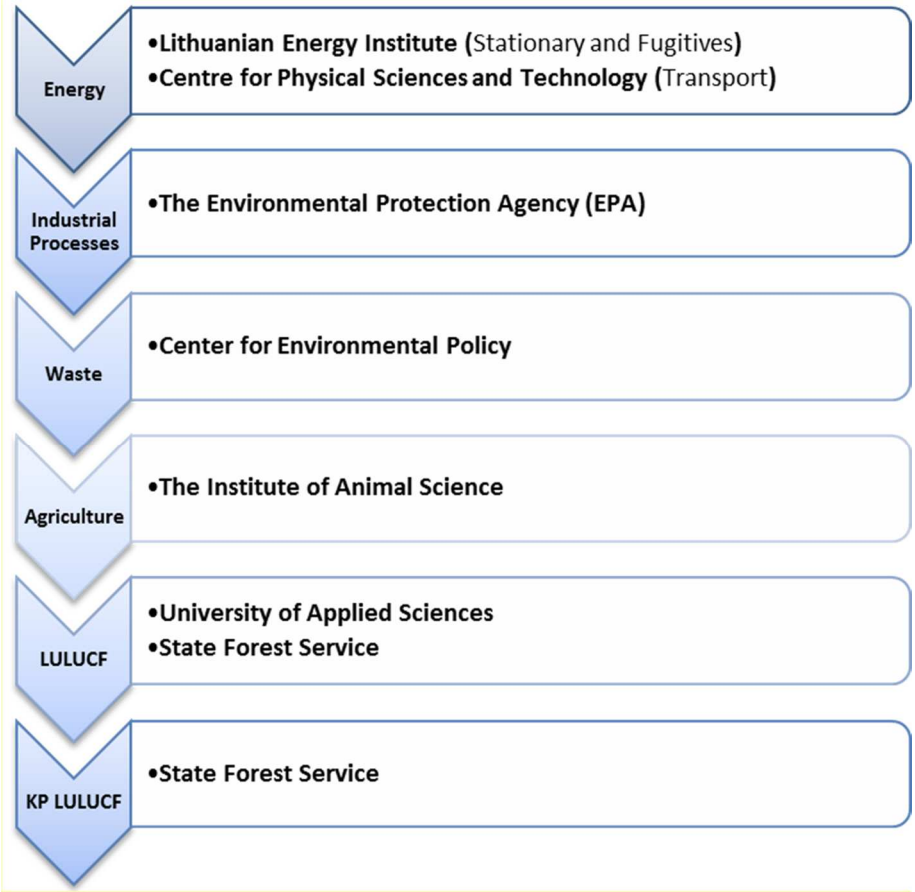

Figure 1-8. The composition of permanent expert working group by institutions for preparation of the National GHG inventory in Lithuania

The State Forest Service (SFS) compiles the National Forest Inventory (NFI) and the forest information system, carries out monitoring of the status of the Lithuanian forests, collects and manages statistical data etc. The Service functions under the Ministry of Environment.

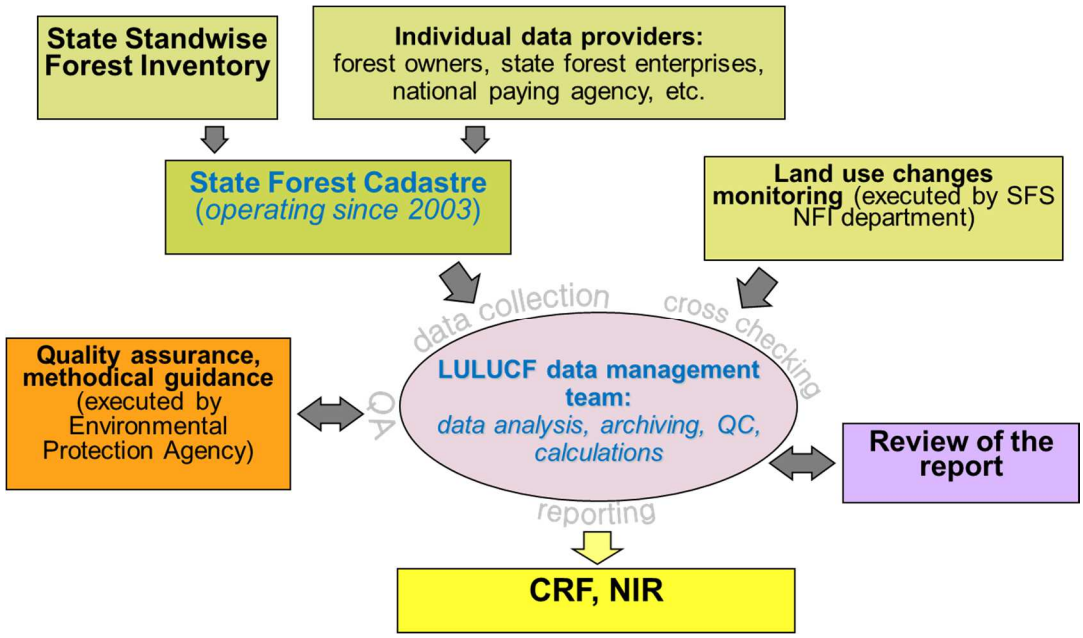

Figure 1-9 LULUCF inventory preparation process

Since 2010 State Forest Service in the GHG inventory preparation process is responsible for calculations of emissions and removals in LULUCF (forestry part) sector and the Kyoto Protocol activities under Art. 3 para. 3 and 4 following the Order No D1-666 of the Minister of Environment of 29 July, 2010 and repealed by the Order No D1-61 of the Minister of Environment of 23 January 2014 on the determination the regulation on the data collection, provision of information and preparation of the reports on national greenhouse gas emission inventory, projections, policy and measures and climate finance. State Forest Service representative is also a member of permanent working group for GHG inventory preparation under the Government Resolution No 683 of 18 December 2011. In this framework, the State Forest Service has the following responsibilities:

- collection of activity data and emission factors used to calculate emissions and removals for LULUCF and KP-LULUCF sectors;
- selection of methods (complying with the IPCC 2006 Guidelines for LULUCF) for calculation of emissions and removals giving the priority to key categories and categories with a high uncertainty;
- emission and removals estimates for LULUCF and KP-LULUCF sectors;
- uncertainty assessment for LULUCF and KP-LULUCF sector;
- checking and archiving of input data, prepared estimates and used materials;
- preparation of Common Reporting Format (CRF) tables and NIR parts for LULUCF and KP-LULUCF;
- implementation of QA/QC plan and specific QA/QC procedures related to LULUCF and KP-LULUCF;
- providing the final estimates (CRF tables and NIR part) for the Environmental Protection Agency;
- evaluating requirements for new data, based on internal and external reviews.

Before submission, reports are forwarded to the National Climate Change Committee for final coordination. National Climate Change Committee was established in 2001 in the first instance and periodically renewed (the latest in April 2014). It consists of experts from academia, government and non-governmental organizations (NGOs) and has an advisory role. The main objective of the Committee is to advise on the

development and implementation of the National climate change management policy. The Committee also has a role on promotion of the implementation of the provisions of the UNFCCC and coordinates compliance with the requirements of the Kyoto Protocol and the EU legal acts related to the UNFCCC.

Union GHG and national Kyoto Protocol registries

The Lithuanian Environmental Investment Fund (LEIF) is responsible for the administration of the Union GHG registry and the national Kyoto Protocol registry. Also it is responsible for the selection and supervision of the implementation of GHG reduction related projects which are financed from the Special Programme for Climate Change.

General description and background information on the National GHG registry was included in the Lithuania's Initial Report, submitted to the UNFCCC in 2006. The Lithuanian GHG Registry had been completely operational since 2005 until 20 June 2012 when the EU Member States' national GHG registries were consolidated to the Union Registry. The current consolidated version also offers a unique access to the national Kyoto Protocol registry and its accounts. Now, all 28 EU countries and Island, Lichtenstein and Norway use the same registry software which is maintained and hosted by the European Commission. Such significant transition also means the achievement of higher security standards.

The national Kyoto Protocol GHG registry is operated in consolidated manner with the Union Registry in accordance with the Commission Regulation (EC) No 389/2013 of 2 May 2013 establishing a Union Registry pursuant to Directive 2003/87/EC of the European Parliament and of the Council, Regulation (EC) No 525/2013 and No 406/2009/EC of the European Parliament and of the Council and repealing Commission Regulations (EU) No 920/2010 and No 1193/2011.

Following the Commission Regulation No 389/2013 the Union Registry is administrated by central administrator (European Commissions) in cooperation with the Member States' national administrators. The central administrator ensures that the Union Registry conforms to the functional and technical specifications for data exchange standards. Also the central administrator operates and maintains the EU Transaction Log (EUTL) in accordance with the provisions of this Regulation.

In order to implement provisions of the Commission Regulation No 389/2013, the Law on Financial Instruments for Climate Change Management was amended on 9 May 2013 (2013, No 54-2691). The Law lays down the provisions on operation and management of accounts under the jurisdiction of the Republic of Lithuania in the consolidated Union Registry.

The Rules of the Use of the Union Registry were approved by the Order of the Minister of Environment No D1-817 on 6 November 2013. These Rules determine the functions of the national administrator – the LEIF, management of accounts in the Union Registry, rights and responsibilities of the EU ETS operators, provisions for use and rendering of accounts' data.

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The internet address of the Union Registry has changed in 2012 and now it is accessible at: https://ets-registry.webgate.ec.europa.eu/euregistry/LT/index.xhtmlImplementing .

2. Quantified Economy-wide Emission Reduction Target (QEERT)

Lithuania – a Party of the Convention and Kyoto Protocol – together with the other EU's Member States has committed to a quantified economy-wide emission reduction target of 20% by 2020, below 1990 level (and move to a 30% reduction provided that other developed countries commit themselves to a comparable emission reduction and that developing countries contribute adequately according to their responsibilities and respective capabilities) which is unconditional and supported by the EU Climate and Energy Package (2009).

Information on Lithuania's quantified economy-wide emission reduction target has been presented to the UNFCCC and is contained in the document FCCC/SB/2011/INF.1/Rev.1 and document FCCC/AWGLCA/2012/MISC.1. No individual target is set for Lithuania in the documents mentioned previously as 20 % target will be reached jointly by the EU.

In addition, the EU Climate and Energy Package also requires Lithuania to increase its use of renewable energy sources to 23% of final energy consumption by 2020 and the share of renewable energy sources of final energy consumption in transport involves not only biofuels and also electricity to 10% by 2020.

The EU Directive of the GHG Emissions Trading System (Directive 2003/87/EC and respective amendments) and the Effort Sharing Decision (Decision No 406/2009/EC) are the main EU legal acts that lay down provisions for the implementation of the target. A joint quantified economy-wide emission reduction target of 20% is calculated providing that in 2020 emissions from sectors covered by the EU ETS will be 21% lower than in 2005. As the common EU climate policy objectives shall be divided in accordance with the capacities of the Member States and their development. In 2013 the European Commission by the Commission Decisions 2013/162/EU and 2013/634/EU) adopted the national annual limits denominated in annual emission allocations (AEAs), which have been transferred into binding quantified annual reduction targets for the period from 2013 to 2020 pursuant to Decision No 406/2009/EC of the European Parliament and of the Council (OJ L 90, p. 106) (hereinafter – ESD). With this decision the national emission targets for 2020 have been set on the basis of Member States' GDP per capita and emission level 2005 (Figure 2-1).

In case of Lithuania over 90 fixed installations (larger than 20 MW combustion plants and chemical industry) and aircraft operators which are participating in the EU ETS jointly with the analogical operators from the other EU Member States will have to cut GHG emissions by 21% compared to 2005, and in the sectors which are not participating in the EU ETS (transport, agriculture, waste management, small industry and district heating companies, households, services and other sectors) the GHG emissions must not exceed annual emission allocations (kt CO_2 eqv.) and to achieve, that GHG emissions in 2020 will not increase by more than 15% compared to 2005, i.e., 2013 – 12.936 m t CO_2 eqv., 2014 – 13.297 m t CO_2 eqv, 2015 – 13.658 m t CO_2 eqv. 2016 – 14.019 m t CO_2 eqv., 2017 – 14.38 m t CO_2 eqv., 2018 – 14.741 m t CO_2 eqv., 2019 – 15.102 m t CO_2 eqv., 2020 – 15.463 m t CO_2 eqv generally over eight years must not exceed 113,600.821 kt CO_2 eqv.

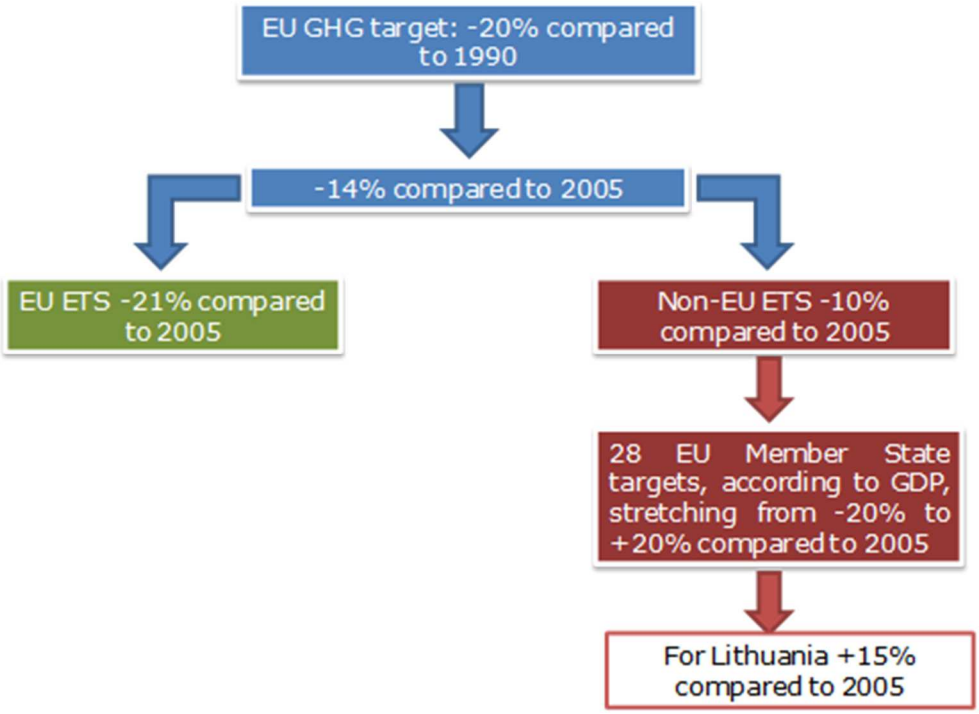


Figure 2-1. GHG emission 2020 target in ETS and ESD separation scheme under the EU legislation (*Lithuania's example*)

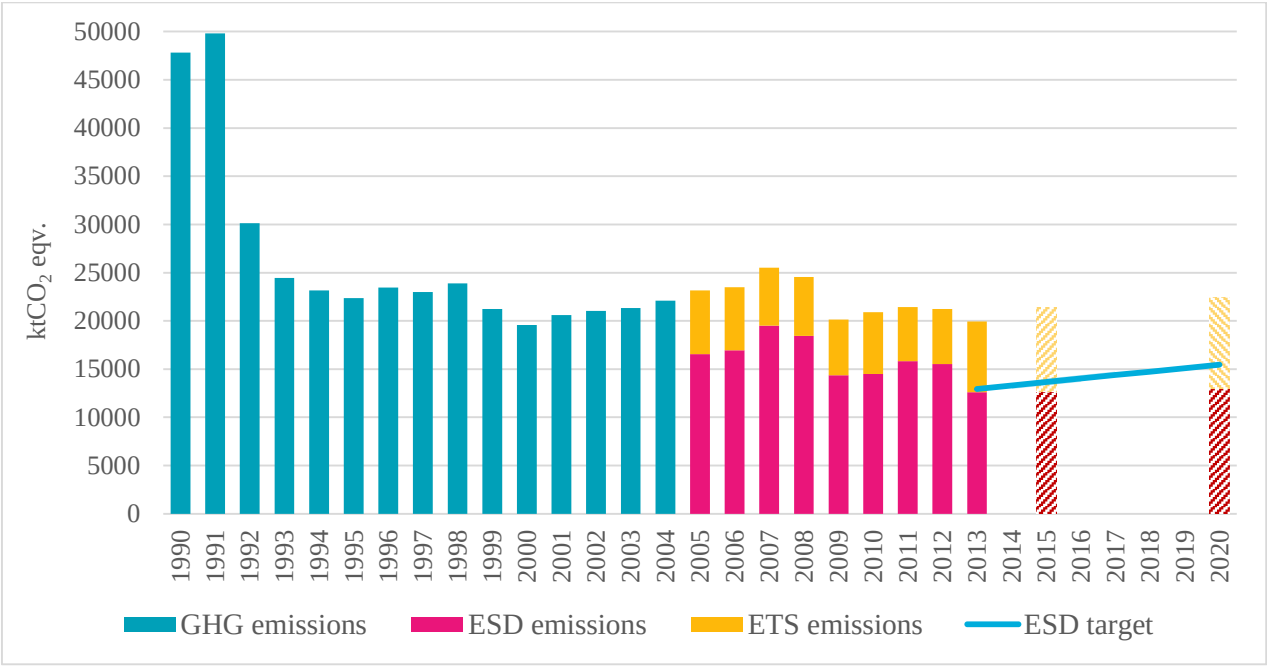


Figure 2-2. Lithuania's GHG emissions trend, projections and the separation into ETS and ESD

Note: GHG emissions including civil aviation, excluding sources and sinks of LULUCF sector. ETS emissions are corrected to take into account the extended scope of the EU ETS of the third trading period.

***Source**: Lithuanian GHG inventory, 2015.*

The ESD allows Member States to make use of flexibility provisions for meeting their annual targets, with certain limitations. There is an annual limit of 3% for the use of project-based credits for each MS. If these

are not used in any specific year, the unused part for that year can be transferred to other Member States or be banked for own use until 2020.

BOX 3.1. Lithuania has decreased its emissions by 5% between 2005 and 2014 (based on 2014 approximated data). According to 2015 projections, Lithuania is on track to reach its 2020 target, with an 18% margin as compared to 2005.[1]

Non-ETS Emissions (vs. 2005)	Projection s/proxy	Target
Projections with existing measures 2020	-3%	+15%
Proxy 2014	-5%	-1%

Lithuania as a Member State with a positive limit under Annex II of ESD, primarily plans to use a possibility to carry over (i.e. to borrow) the lacking part of the AEAs from the forthcoming year, if GHG emissions in current year exceed the amount of AEAs for that year. Secondly, – to use credits from project activities and lastly – to acquire AEAs from other Member States, if the previous two flexibilities are in sufficient.

Based on the Lithuanian GHG emissions projections, Lithuania might have difficulties to comply with the annual emission allocations in years 2013–2015 with a shortage of approximately 1 m t CO_2 eqv in total and indicative total amount of 2 m t CO_2 eqv surplus intended to be made available for transfers to other Member States in years 2018–2020.

The quantified economy-wide emission reduction target for Lithuania is provided in Annex the CTF Table 2.

3. Progress in achievement of QEERT

Lithuania as a Party to the UNFCCC and the Kyoto Protocol is committed to provide annually information on national anthropogenic GHG emissions by sources and removals by sinks for all GHG not controlled by the

Montreal Protocol. For Lithuania the base year for reporting GHG emissions is 1990 for the greenhouse gases CO_2, CH_4, N_2O and 1995 for the F-gases HFC, PFC, SF_6 and NF_3. In current situation, Lithuania already achieved 58.3% GHG reduction compared to base year 1990 (excluding LULUCF) while GDP growth for the 1990–2013 period was approximatively 29%.

3.1 Domestic institutional arrangements relating to Lithuania's QEERT

Government structure

The governance of the Republic of Lithuania is performed by the Seimas (Parliament), the President of the Republic and the Government as well as the Judiciary according to the Constitution of the Republic of Lithuania (enacted by citizens of the Republic of Lithuania since 25 October 1992).

Seimas of the Republic of Lithuania considers, adopts and issues laws, discuses and approves the programme of the Government and supervise its policy, approves cross-sectorial strategic policies and ratifies international treaties.

The Government of the Republic of Lithuania administers the affairs of the country, executes laws and resolutions of the Seimas on the enforcement of laws, co-ordinates the activities of the ministries and other establishments of the Government, prepares draft State Budget and submits it to the Seimas; executes the State Budget and submits to the Seimas a report on the execution of the budget, prepares draft laws, approves sectorial development programmes, establishes diplomatic relations and maintains relations with foreign states

[1] Source: http://ec.europa.eu/priorities/energy-union/state-energy-union/docs/lithuania-national-factsheet_en.pdf

and international organizations, discharges other duties prescribed to the Government by the Constitution and other laws. [21]

There were 14 ministries in the Republic of Lithuania in 2015:

- Ministry of Agriculture,
- Ministry of Culture,
- Ministry of Economy,
- Ministry of Education and Science,
- Ministry of Energy,
- Ministry of Environment,
- Ministry of Finance,
- Ministry of Foreign Affairs,
- Ministry of Health,
- Ministry of Justice,
- Ministry of National Defence,
- Ministry of Social Security and Labour,
- Ministry of the Interior,
- Ministry of Transport and Communications.

After the Seimas ratified the UNFCCC (1995), the Kyoto Protocol (2002) and Kyoto Protocol Doha Amendment in 2015, most of the obligations of international agreements implementation and the related policy-making responsibilities lied down on the Ministry of Environment, within its competence coordinating policies and legislation drafts with the Ministries of Economy, Energy, Transport and Communication, Agriculture, Finance, Foreign Affairs. The Ministry of Economy is responsible for preparation of the National Long-term Development Strategy, the National Progress Programme for 2014–2020, the National Reform Programme 2020 and the Lithuanian innovation strategy for the year 2010–2020 that set out the measures to accelerate economic growth, economic competitiveness, eco-innovation and employment, and promote investment in human capital. The Ministry of Energy is responsible for the long term energy policy development, including energy efficiency and use of renewable energy sources, and implementation of energy infrastructure projects.

The Ministry of Environment as the main institution forming the country's state policy of environmental protection, forestry, use of natural resources, geology and hydrometeorology, territorial planning, construction, provision of residents with housing, utilities and housing, as well as coordinating its implementation, has made a significant contribution to climate change regulation.

The entire territory of the Republic of Lithuania is divided into counties (10) and municipalities (60). Such administrative division of the territory is regulated by the Law on the Territorial Administrative Units of the Republic of Lithuania and their Boundaries. Municipality is defined as an administrative territorial unit in which the community has a right to self-government guaranteed by the Constitution, to be implemented within the national territory of the administrative unit residents elected municipal council and its conclusion, and it is accountable to the executive and other municipal authorities and bodies. Municipalities are governed by the Law on the Local Self-Government. The county is defined as the Republic of Lithuania higher territorial unit, but no longer administrative since the Law on the Vitiation of Law on the County Management and further

amendments of the laws was adopted on 7 July 2009. Part of the counties' functions is transferred to the municipalities. The State shall maintain those functions, which are necessary for implementation of the national policy in specific sectors and ensure supervision of the state.

3.2. Mitigation actions and progress towards Lithuania's QEERT

3.2.1. Climate change management policy in Lithuania

In accordance with the Kyoto Protocol Lithuania has undertaken to reduce its GHG emissions by 8% below 1990 level during the first commitment period 2008–2012 and successfully implemented achieving 56% GHG reduction, while GDP increased by 25%. In 2012 Lithuania together with the other EU Member States and Iceland undertook 20/30% GHG emissions reduction below 1990 level commitment for the second Kyoto Protocol period from 2013 till 2020. The Doha Amendment of the Kyoto Protocol was ratified by the Seimas on 20 October 2015.

On 7 July 2009 the Seimas of the Republic of Lithuania adopted the Law on Financial Instruments for Climate Change Management. This Law stipulates the rights, duties and liabilities of the persons engaged in the economic activities resulting in GHG emissions as well as the sphere of competence of state institutions/authorities and bodies.

On 16 September 2009 the Government of the Republic of Lithuania by its Resolution No 1247 approved the updated National Strategy for Sustainable Development. In order to reach the objectives set forth in the strategy, implementation plan was prepared. Environment protection and climate change topics are under consideration in this Strategy.

On 15 May 2012 the Parliament of the Republic of Lithuania with its Resolution No XI-2015 adopted Lithuania's Progress Strategy "Lithuania 2030". This Strategy underlines the need for incentives for business to invest in green technologies, products and services. The main challenges and tasks in the period 2014–2020 may appear in the increase of energy efficiency and use of renewable energy sources (hereinafter – RES) in final energy consumption by creating and introducing low carbon technologies in industry, agriculture and transport sectors. It is indicated that stronger cross-sectorial cooperation between research and industry is needed as well as international cooperation on joint climate change adaptation and risk prevention and management. The National Progress Programme for 2014–2020 was approved by the Government Resolution No 1482 of 28 November 2012 for the implementation of this Strategy.

The main national strategy for climate change management, elaborated and approved in November 2012, is the Strategy for the National Climate Change Management Policy until 2050, which sets legally binding short-term (until 2020), indicative mid-term (till 2030 and till 2040) and long-term (until 2050) adaptation and mitigation targets and objectives. Looking on the long term, Lithuania has committed to contribute to the EU milestones to reduce GHG emissions by 2030 – 40 %, by 2040 – 60 % and by 2050 – 80 % compared to 1990 level. Legally binding mitigation targets and objectives are set in the following Lithuania's economy sectors: energy, industry, transport, agriculture, households, environmental protection and rational use of national resources, spatial planning, health care, science, education and provision of information to the public, international co-operation. It also defines policies and measures necessary for Lithuania to meet its Kyoto Protocol second commitment period target. Inter-institutional action plan on the implementation of the Goals and Objectives for 2013–2020 of the Strategy for the National Climate Change Management Policy was approved on 23 April 2013 by the Government Resolution No 366 and it is annually updated. It contains provisions related to moving to a competitive low carbon economy and foresees measures for climate change adaptation and mitigation in Lithuania for the years 2013–2016. The Action Plan consists of general provisions, targets, objectives, measures, financial resources, implementing institutions, assessment criteria

and values. Following the Strategic planning methodology approved by the Government, the plan is prepared for the three years period and is updated annually by adding one more year. Besides that, ministries and other governmental institutions are obliged to mainstream the goals and objectives into sectorial policies and plans as set forth by the Strategy, to establish implementation measures and to ensure close inter-institutional cooperation while developing the strategies, their implementation plans and programmes of individual sectors of economy.

In order to comply with annual GHG emission reduction targets in non-EU ETS sectors, quantitative annual GHG emission reduction targets in m t CO_2eqv. were determined for transport, agriculture, waste management, non-ETS industries and other sectors are set as assessment criteria in the Action Plan. The results of the measures implemented in accordance with the Inter-institutional Action plan will form the basis for the update of the Strategy for the National Climate Change Management Policy.

In 2014 and 2015 new Action Plans with *measures for 2015–2017* and *measures for 2016–2018* were adopted by the Resolutions of the Government of the Republic of Lithuania.

Since 2010 a Special Program for Climate Change has been developed as it was determined in the Law on Financial Instruments for Climate Change Management. The Program aims to develop an additional funding for climate change management measures. The Program funds are kept in a separate account of the State Treasury. Income and expenses of the Program are planned in the State budget according to the special principles of the funding program. The Program funds are used for increase energy efficiency, use of RES and implementation of the measures of inter-institutional Action Plan on the Implementation of the Goals and Objectives for 2013–2020 of the Strategy for the National Climate Change Management Policy. In 2011–2014 more than *127 m EUR* were allocated for energy efficiency and renewable energy projects.

3.2.2. The monitoring and evaluation procedure of the implementation of the policies and measures related to climate change management in Lithuania

Monitoring of the effectiveness of the implementation PaMs usually is done at the level of individual policies or measures.

The Ministry of Environment is a coordinating institution of the implementation of the Strategy and plays the main role in the implementation process together with institutions within its remit. The Strategy for National Climate Change Management Policy for 2013–2050 implements the EU legal acts on climate change and Third energy package, and replaces the National Strategy for the Implementation of the UNFCCC until 2012. Every two years, the Government of the Republic of Lithuania accounts for the implementation of the Strategy to the Parliament of the Republic of Lithuania by preparing and presenting a report on the implementation of the Strategy. The role of the Ministry of Environment is defined in the Chapter VII on Implementation of the Strategy and accountability of the Strategy for the National Climate Change Management.

As it is stated in sub-chapter 3.2.1 the goals and objectives of the Strategy is implemented by the Inter-institutional Action Plan, thus the State and municipal institutions engaged in the implementation of the Strategy and the Inter-institutional Action Plan on annual bases provide the Ministry of Environment of the Republic of Lithuania with the information about the progress in implementing the Strategy and its implementation plan by submitting annual activity reports. The progress of the implementation of the Strategy is evaluated by the set of criteria established in the Inter-institutional Action Plan.

The Ministry of Environment is also responsible for the collection and analysis of the information on implementation process of PaMs related to the GHG reduction in different sectors and submitting it to the

UNFCCC Secretariat according to decisions 9/CP.16, 2/CP.17 and 19/CP.18 as part of National Communication and Biennial Report and to the European Commission under the regulation No 525/2013.

The main legal legislation which sets the climate change management system in Lithuania is the Law on Financial Instruments for Climate Change Management. This Law aims to stipulate the rights, duties and liability of the persons engaged in the economic activities resulting in GHG emissions as well as the sphere of competence of state institutions and bodies and provide measures to manage climate change in Lithuania in order to implement obligations of the Republic of Lithuania under the EU legislation, the UNFCCC and the Kyoto Protocol.

The Environmental Protection Agency is involved in the implementation of the goals and objectives defined in the Inter-institutional Action Plan of the Strategy for National Climate Change Management. The Agency's role in evaluation of PaMs mitigation of GHG emissions is mostly related to the preparation of the GHG projections estimations by evaluating all the actual and expected implemented PaMs mitigation actions on the GHG emissions.

In addition to the Environmental Protection Agency there are other institutions within the remit of the Ministry of Environment that are participating in the implementation as well as monitoring of the PaMs which mitigate GHG emissions. For example, the Housing and Urban Development Agency is responsible for the implementation of the renovation (modernization) of the multi-apartment buildings built before 1993 program and its monitoring process according to the monitoring procedure description approved by the order No D1-1055 of the Minister of Environment. This monitoring aims to determine the actual energy savings and the GHG emission reduction in the renovated buildings, assess the work quality, the energetic and technical efficiency of the implemented measures, further improve building renovation process control and maintenance as well as technical and technological regulation.

3.2.3. Cross-sectorial strategic policies related to climate change mitigation

The main national strategic documents and programmes which include targets and objectives related to climate change mitigation are presented in the Table 3-1.

Table 3-1. National strategic policies directly or indirectly related to climate change mitigation

No	Title	Objective/Description
Cross-sectorial		
1.	**Lithuania's Progress Strategy 2030** was approved by the Parliament of the Republic of Lithuanian in 2012.	It defines the State's vision and priorities for the development and implementation activities until 2030. This is the main guiding policy which should be used while preparing and developing the national sectorial development plans or programs. The National Progress Programme for 2014–2020 was approved on 28 November 2012 by the Resolution No 1482 of the Government of the Republic of Lithuania for the implementation of Lithuania's Progress Strategy 2030; and the main priorities for the use of the EU funds from the EU's Multiannual Financial Framework 2014–2020 were determined.
2.	**The** National Reform Programme was adopted on 27 April 2011 by the Resolution No 491 of the Government of the Republic of Lithuania.	The Programme summarises the main structural reforms that Lithuania projects in its effort to eliminate obstacles to economic growth and achieve the nationally established quantitative targets in the context of **the Strategy 'Europe 2020'**. This Programme provides an overview of the present situation in the areas evaluated by the quantitative targets, their projections for 2015 and 2020 and priorities for action planned to achieve the identified national-level objectives. The progress is measured using five quantitative targets and one of them is energy and climate

No	Title	Objective/Description
		change. The key policy directions in energy and climate change are: increasing the use of RES, improving energy efficiency and limiting GHG emissions. The measures foreseen for implementation of the National Reform Programme 2020 are set in the sectorial programmes. Programmes are harmonized, e.g., targets related to energy efficiency in one programme are the same as in another. As typically different institutions are involved in implementation of the Strategy, an inter-institutional action plan is drawn in order to set clear actions what should be undertaken in order to implement particular programme. For monitoring and evaluation of progress, institutions shall yearly report about actions in the previous year.
3.	**The Strategy for the National Climate Change Management Policy** adopted on 6 November 2012 by the Decree No XI-2375 of the Parliament (Seimas) of the Republic of Lithuania.	The Strategy implements the EU legal acts of the Climate change and energy package till 2020 and replaces the National Strategy for the Implementation of the UNFCCC until 2012. The goal of this Strategy is to develop and implement climate change management policy in Lithuania. Strategy sets the short-term (until 2020), indicative mid-term (until 2030 and until 2040) and long-term (until 2050) goals and objectives in the field of climate change mitigation and adaptation. The Strategy in English is available on website of the Ministry of Environment of Republic of Lithuania: < http://www.am.lt/VI/index.php#a/12869 >. For the implementation of goals and objectives of the Strategy, **the Inter-institutional Action Plan on the implementation of the Goals and Objectives for 2013–2020 of the Strategy for the National Climate Change Management Policy** has been approved by the Government Resolution No 366 and it is annually updated. The purpose of the Action Plan is to provide financing for climate change mitigation and adaptation measures foreseen for the implementation of the goals and objectives of the Strategy and to ensure an inter-institutional cooperation.

3.2.4. National Economic and Financial Instruments for Climate Change Management

The following economic and financing instruments are applied in order to implement targets set in the Strategy for the National Climate Change Management Policy and sectorial strategies: the EU emissions trading system (ETS) from which revenues of auctioned allowances are earmarked to the Special Programme for Climate Change, the EU structural and investment funds for 2014–2020, e. g. the Cohesion Fund, the European Agricultural Fund for Rural Development via the Rural Development Programme for Lithuania 2014–2020, the JESSICA Holding Fund and Energy Efficiency Fund, etc.

In the Figure scheme the financial and economic instruments directly or indirectly contributing to management of climate change policy in Lithuania are shown.

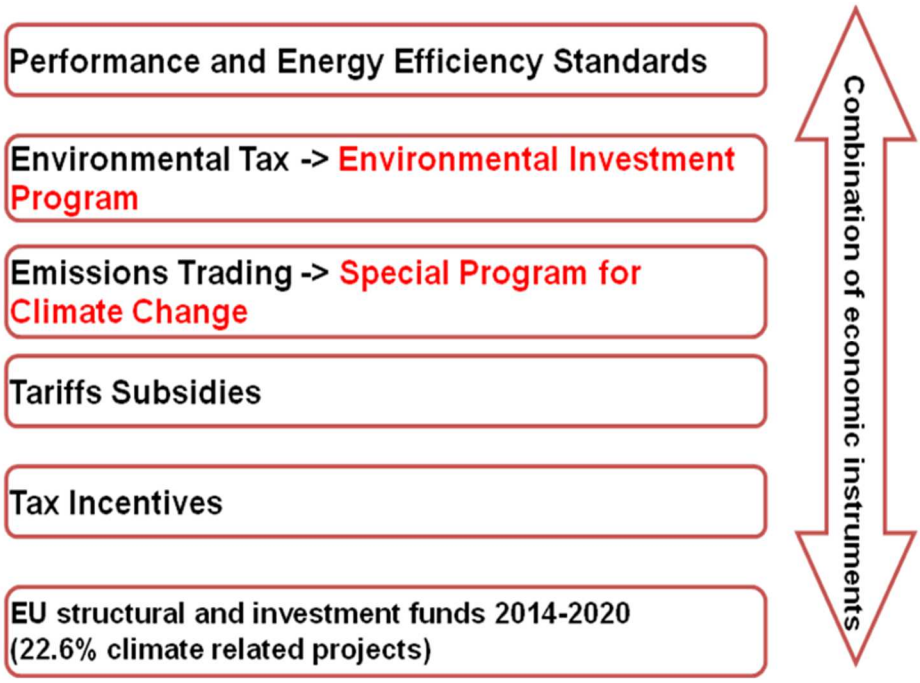


Figure 3-1. Economic and financial support instruments contributing to management of climate change policy in Lithuania

3.2.4.1 Implementation of the EU ETS in Lithuania

All the provisions of the European Parliament and Council directive 2003/87/EB, amended by the Regulation (EU) No 421/2014 (OL 2014 L 129, p.1), are transposed in to the national legislation by the Law on Financial Instruments for Climate Change Management adopted on 7 July 2009 and its implementing legal acts.

The Law stipulates the rights, duties and liability of the persons engaged in the economic activities resulting in GHG emissions as well as the sphere of competence of state institutions and bodies. The law also sets forth the main provisions on administrative structure for the administration and implementation of Joint Implementation (JI) and Clean Development Mechanism (CDM) projects.

More information on implementation of the EU ETS in Lithuania is provided in the 6th National Communication and 1st Biennial report (2014).

With the latest data in Lithuania over 90 installations and 4 aircrafts operators were actively participating in the EU ETS in 2014. The installations included in the EU ETS sectors in Lithuania are the following:

- 80 instillations which burn fuel and net rated thermal input is more than 20 MW (except installations incinerating or disposing hazardous or municipal waste);
- 1 installation of oil refinery;
- 2 installations of cement clinker and lime production in rotation furnace (when production capacity is more than 500 t per day or other type of furnaces then the capacity is more than 50 t/day);
- 2 installations producing glass production (capacity is more than 20 t/day);
- 6 installations producing ceramic products (when production capacity is more than 75 t/day);
- 1 installation producing stone wool by using glass, rocks or slag (when capacity of melting are bigger than 20 t/day);
- from 2013 1 installation producing nitrogen acid;

- from 2013 1 installation producing ammonia.

The variation of the EU ETS sector's verified emissions (except GHG emissions from aircrafts) and allocated EUAs in 2005–2014 m. are illustrated in Figure 3-2.

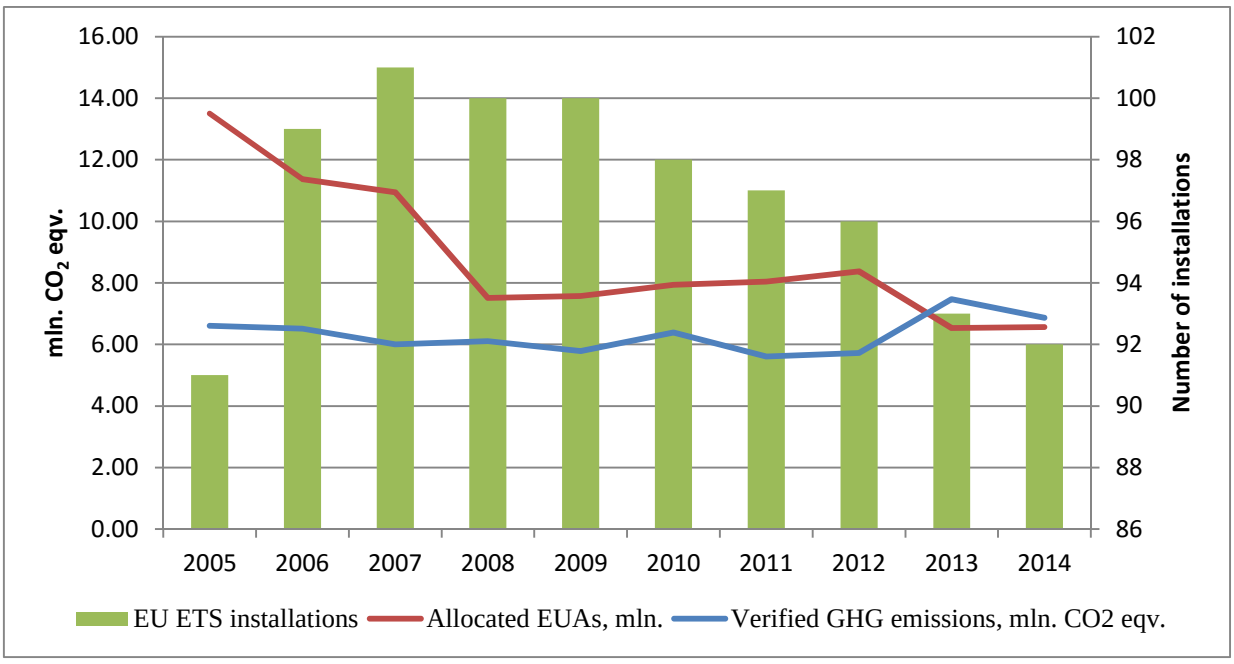


Figure 3-2. Variation in verified GHG emissions, number of installations in 2005-2014 and a number of current and EUAs allocations. [2]

The increase of GHG emissions in 2013 of the EU ETS sectors in Lithuania was influenced by the inclusion of nitrogen acid and ammonia production in the system. In the period of 2008–2012 the share of emissions from industrial processes was only 15–17 % and from 2013 this share increased to 44 %.

3.2.4.2 Joint implementation projects and other projects

Totally in the period of 2008–2012 there were implemented 11 Joint implementation (hereinafter – JI) projects related to GHG emissions reduction in electricity sector (10 wind power parks, 1 landfill biogas use for heat and electricity production) and the estimated GHG emissions reduction during whole period is 864 kt CO_2.

Together with the implemented JI projects during 2008–2012 period in Lithuania 64 wind power plants (total capacity 183.8 MW) had been installed (in 2002 – 2012 period there were 78 operating wind power plants in Lithuania with an installed capacity of 234.8 MW). And during the period 2003 – 2012 totally 20 biogas plants had been installed in Lithuania with the capacity of 20.32 MW.

GHG emissions reduction due to the 2 JI projects of N_2O emissions reduction in chemical industry amounts to 7 643 017 tCO_2eqv. Thus, without the implementation of these projects in 2013 the ETS sector's verified emission could be 1.2 m t CO_2eq higher (8.7 m instead current 7.5 m t CO_2eqv). [2]

In 2013 the only cement manufacturing company SC "Akmenės Cementas" ended modernization of technology process, when wet cement production methods was changed in to dry. This modernization allows saving the fuel consumption by half for a production unit and by quarter reducing GHG emissions. To compare, to produce 1 t of clinker using the wet method 1.2 t of CO_2 is emitted and 0.85 t CO_2 is emitted by dry method[2] This allows SC "Akmenės Cementas" to reduce GHG levels by 500 GgCO_2 eqv/year.

[2] http://www.cementas.lt/index.php?id=210

3.2.4.3 The financial programs for implementation of climate mitigation measures

Table 3-2. The main financial programs applied to actions related with the climate change mitigation in Lithuania

No	Title	Description
1.	**Special Programme for Climate Change** established on 7 July 2009 by the Law on Financial Instruments for Climate Change Management.	Funding estimate of Special Programme for Climate Change for 2015 envisaged allocating 30 million EUR (approximately 17 million EUR for energy efficiency projects and 13 million EUR for RES and other projects) for measures implemented to reach a quantitative reduction of GHG emissions. These measures envelope energy production and consumption efficiency increase in residential (multi-apartment and single or two flat houses) and public buildings, as well as other measures which effectively reduce GHG emissions in energy, industry, construction, transport, agriculture, waste management and other sectors. The main focus of the allocation of finances are set on these criteria: • At least 40 % of funds must be allocated to projects which increase energy efficiency; • At least 40% of funds must be allocated to projects which promote use of renewable energy and environmentally friendly technologies; • The rest of the proceeds may be used for various projects, without compulsory quantifiable emissions reduction, such as various climate change related measures that promote science, research and development, awareness, education and climate finance to developing countries, etc. In 2014 funding from Special Programme for Climate Change was 106 million LTL[3] for implementation of measures such as: - modernisation of the one or two apartment building, built with the respect to the technical construction requirements and owned by natural entity and private legal entity, ensuring that the class C of energy efficiency is reached and energy consumption is reduced not less than by 20 % (allocation –3.2 million LTL); - additional compensation to the owners of multi-apartment buildings or other premises, implementing the modernisation programme in accordance with the programme approved by the Government, equal to the 25 % of the investment if the consumption of the heating energy after the implementation of the projects is reduced not less than by 40 % (allocation – 50 million LTL). - modernisation of the public buildings with the view to reducing energy consumption (allocation – 20 million LTL). - promotion of use of renewable energy sources and environmentally friendly technologies (allocation – 32 million LTL).
2.	**Lithuania's Rural Development Programme 2014 – 2020** *replaced* National Strategic Plan for 2007 – 2013 Rural Development.	Lithuania's Rural Development Programme for 2014–2020 period was approved by European Commission on 13 February 2015. Programme for the new period further enhances the existing policy framework for sustainable management of natural resources, contributing to both climate change mitigation and enhancing the resilience of farming to the threats posed by climate change and variability. The continuation of support for planting of short rotation coppices is foreseen under the sub measure "Investment to agricultural holdings" of the measure "Investments in physical assets" and biogas production from livestock holdings waste is foreseen under the sub measure "Support for production of biogas from agricultural and other waste" of the measure "Farm and business development" of the Rural Development Programme for Lithuania 2014–2020. To implement sub-measure "Support for production of biogas from agricultural and other waste" 45.2 million EUR have been allocated. In the National Rural Development Program for 2007–2013, which aimed at the improvement of life quality in rural areas by increasing employment, supporting transition from agricultural activities to non-agricultural activities, stimulating the

[3] 1 EUR = 3.4528 LTL

No	Title	Description
		development of main services and crafts of the rural population, financial support for rural development from the European Agricultural Foundation (EAF) was foreseen based on the following trends: increased competitiveness of agricultural and forestry sector, improvement of environment and landscape, improvement of life quality and other measures. In order to reduce water pollution, especially focussing on nitrates and other chemical elements that may have an adverse effect on public health, biodiversity, alter the traditional landscape, as well as protection of the waters of the Republic of Lithuania from eutrophication, support under the measure "Modernisation of agricultural holdings" of the Rural Development Programme for Lithuania 2007–2013 has been provided for the implementation of the Nitrates Directive in farm holdings. Also, with an aim to produce biomass as a source of energy which partially replaces imported raw materials (oil, gas, coal) and contributes to the reduction of CO_2 emissions which causes the greenhouse effect, support under this measure was granted to the planting of short rotation coppices and production of biogas from the waste of holdings. A total sum of 12.4 million EUR was allocated to the beneficiaries satisfying the requirements of the Nitrates Directive and 0.6 million EUR is paid out for short rotation coppices. There were no biogas production projects applying for support during 2007–2013.
3.	**The JESSICA Holding Fund**	Lithuanian Government established the JESSICA Holding Fund to offer an attractive financing scheme to support the improvement of energy efficiency in multi-apartment buildings, which were built prior 1993. At a later stage the scheme was extended to cover student dormitories and other buildings under the jurisdiction of the Ministry of Education and Science. JESSICA loan (maturity up to 20 years at fixed annual interest rate of 3%) is offered to the owners of apartments or other premises in a multi-apartment buildings, provided they commit themselves to implement energy efficiency measures which would result in (i) achieving at least 20% of energy savings as compared to the baseline and (ii) meeting at least the energy efficiency Class D requirements. If these targets are met, the beneficiaries qualify for a "bonus" – an interest subsidy which equals to 15% of loan principal. At the end of 2011 the Lithuanian Parliament introduced an additional incentive to compensate additional 15% of investment cost, provided the overall calculated energy savings reach at least 30% as compared to the baseline (the Law on the State Support for the Modernization of multifamily buildings of the Republic of Lithuania amended on the 11th of October, 2011). Currently the additional improvement of this program is introduced. By the amendments of the Law adopted on 17 January 2013, the municipalities are more involved in the renovation process of the multi-apartment buildings. The municipality appoints one responsible entity which may take the loan for renovation on preferential conditions. With these changes the additional incentives to compensate investment cost to citizens were introduced, the 15 % of loan is compensated from State's budged and 25% from the Special Programme for Climate Change if the 40% of energy saving was reached compared with baseline. From 2013 till 2015 670 multi-apartments have already been renovated (in 2005–2012 were renovated 479), at present 1200 are under renovation and investment plans of 3 658 projects are being coordinated.
4.	**Energy Efficiency Fund**	On 18 February of 2015 the Ministry of Finance and the Ministry of Energy together with the Public Investment Development Agency established the Energy Efficiency Fund. The Fund will provide investments in energy efficiency projects using the following financing tools: loans for the modernization of central government buildings and guarantees for loans from commercial banks for the modernization of street lighting projects. Fund manages 79.65 million EUR.

No	Title	Description
		The Public Investment and Development Agency was appointed as the Fund manager. It is expected that the first loans and guarantees from the Fund will be provided in summer of 2015.
5.	**Cohesion Policy Contribution**	The EU Cohesion policy provides for important investment possibilities to implement energy policy objectives in Lithuania which will be complemented by national public and private co-financing, aiming at optimal leverage. It also ensures integrated territorial solutions to challenges by supporting capacity building and territorial cooperation, including the Baltic Sea Region macro-regional strategy in which Lithuania takes part. • ***Internal Energy Market:*** Over 2014–2020, EU Cohesion Policy will invest some EUR 154 million in smart transmission systems, as well as some EUR 21 million in smart electricity distribution grids in Lithuania. These investments are expected to contribute to around 10 000 additional users connected to smart grids. • ***Energy efficiency:*** Over 2014–2020, EU Cohesion Policy will invest some EUR 540 million in energy efficiency improvements in public and residential buildings and in enterprises, as well as in high-efficiency cogeneration and district heating in Lithuania. A further estimated EUR 626 million will be invested in supporting the move towards an energy-efficient, decarbonised transport sector. These investments are expected to contribute to around 3000 households with improved energy consumption classification and a decrease of around 60 GWh per year of decreased primary energy consumption of public buildings, as well as to around 74 km of reconstructed or upgraded railway lines, and 20 km of new or improved inland waterways. • ***Decarbonisation:*** Overall, the EU Cohesion Policy investments in Lithuania over 2014–2020 are expected to contribute to an estimated annual decrease of GHG of around 680 000 tonnes of CO_2eq. Over 2014–2020, EU Cohesion Policy will invest some EUR 330 million in renewable energy in Lithuania. These investments are expected to contribute to around 760 MW of additional capacity of renewable energy production. • ***Research, Innovation and Competitiveness:*** Over 2014–2020, EU Cohesion Policy will invest significantly in R&I and in SME competitiveness in Lithuania. This will be based on the national strategy for smart specialisation. For Lithuania, the Strategy includes a focus on energy and a sustainable environment priorities, namely (1) smart systems for energy efficiency, diagnostic, monitoring, metering and management of generators, grids and customers, (2) energy and fuel production using biomass/waste and waste treatment, storage and disposal, (3) technology for the development and use of smart low-energy buildings – digital construction and (4) solar energy equipment and technologies for its use for the production of electricity, heat and cooling. At this stage, at least EUR 103 million is foreseen for investments in R&I and adoption of low-carbon technologies in Lithuania, but this might increase further in line with the evolving content of the smart specialisation strategy.

3.2.5 National policies and measures in different sectors

In this sub-chapter the main policies and measures related to climate change mitigation in different Lithuania's economy sectors as well as having the most influence on GHG emissions reduction at national level are overviewed.

3.2.5.1 Energy

The Law on Energy (2002, with later amendments) is the main law, setting the functions and obligations in the energy sector. Different energy sub-sectors are regulated by the following sectorial laws: the Law on Electricity (2000, with later amendments), the Law on Heat Sector (2003, with later amendments), the Law on Natural Gas (2000, with later amendments), the Law on Nuclear Energy (1996, with later amendments), the Law on the Nuclear Power Plant (regulates implementation of the new NPP) (2007, with later amendments), the Law on Construction (1996, with later amendments), the Law on Energy from Use of Renewable Energy Sources (2011, with later amendments).

In energy sector, the focus will be on implementation of the strategic projects aimed to achieve energy independence including ensuring sufficient local power generation capacities to cover domestic demand (estimated at 12–14 TWh in 2020). Lithuania is obligated to progressively increase the use of renewable energy resources in the production of electricity and heating. According to the current legal documents state aims to reach the target of 23% of renewable energy in final energy consumption in 2020, including no less than 20% of renewable energy in the electricity sector, 60% in the district heating sector and 10% in the transport sector and 80% in the households. The main policies related to climate change mitigation in energy sector are provided in Table 3-3.

Table 3-3. The main policies related to climate change mitigation in energy sector

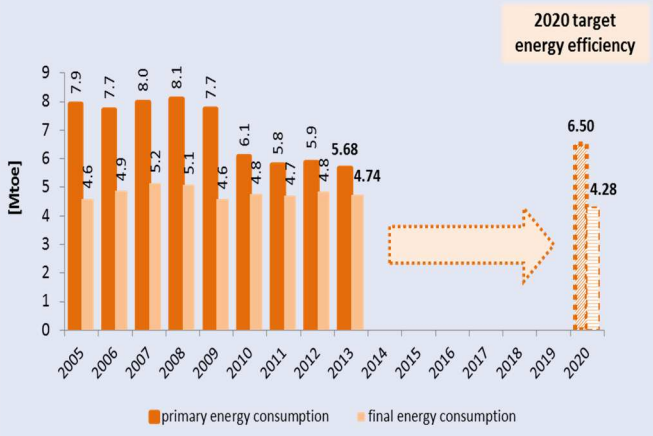
No	Title of document	Description of document
1.	**The National Energy Strategy,** approved of by the Parliament (Seimas) of the Republic of Lithuania in 2007 was repealed with new **National Energy Independence Strategy,** adopted on 26 June 2012 by the Decree No XI-2133 of the Parliament of the Republic of Lithuania (*currently under revision*)	The main goal of the Strategy is to ensure Lithuania's energy independence before the year 2020 by strengthening Lithuanian's energy security and competitiveness. The following main programmes and plans are prepared, setting the particular measures for the implementation of energy sector targets: District Heating Development Guidelines, the Energy Efficiency Action Plan, and the National Renewable Energy Resources Development Strategy adopted on 21 June 2010 by the Government Resolution No 789 of the Republic of Lithuania. Improvement of energy efficiency through increase of cogeneration is among the targets set in the National Energy Independence Strategy. Besides the main objectives set until 2020, in the currently valid Energy independence strategy the energy sector development guidelines for 2030 and 2050 are set. However, there is no quantitative targets for RES, EE but the guidelines for 2030 are the following: • in 2020–2030 in the country energy efficiency will increase by 1.3% per year; • RES share will continue to increase in the final energy balance. Indicative targets outlined for 2050: 40-100% renewables in the energy mix; 0-30% nuclear energy, and 0-30% fossil fuel with carbon capture storage.
2.	**National Renewable Energy Resources Development Strategy** adopted on 21 June 2010 by the Government Resolution No 789 of the	The main objective of this Strategy is to meet the demand of electricity in the best way in the sector of electricity, heating and transport by increase of the share of RES in the final energy balance and to refuse the importation of polluting fuel and in this way to increase the energy security, energy independence and to contribute to the international efforts to reduce the emissions of GHG. This

No	Title of document	Description of document
	Republic of Lithuania (*currently under preparation the* **National Renewable Energy Resources Programme for 2016-2020**).	strategy foresees the minimum RES trajectory ensuring that Lithuania meets the objective of 23% of RES in the final energy consumption in 2020. According to the targets set in the Strategy the part of RES in the final energy consumption must reach not less than 18.6% in 2015-2016, not less than 20.2% in 2017-2018, and by 2020 not less than 23%. Lithuania in the last decade has rather successfully deployed renewable energy sources. According to the Lithuanian Statistics, in 2013 Lithuania has already generated 22.95% of its gross final energy from RES and almost reached target set for 2020. It is expected that renewable energy will exceed the 23% target for 2020. The update of the National Renewable Energy Resources Development Strategy until 2020 is being performed. Lithuania further plans to increase the share of RES in gross final energy consumption by 2020 (update of the strategy): in heating and cooling sector from 37.72% to 45% (district heating sector from 33% to 70%), in electricity from 13.14% to 20%; in transport sector currently the government is looking into possible measures how to reach 10% with the lowest cost. It is planned to implement two major national importance cogeneration projects (in Vilnius planned cogeneration plant (biomass/waste) of 150 MW_e power and in Kaunas –50 MW_e) that will contribute to the national sectorial targets in electricity, heating and cooling sectors and also to the share of RES in gross final energy consumption by 2020. Concerning latter, it is expected to reach 29-30% in 2020.
3.	**Strategy on dwellings of the Republic of Lithuania** approved in 21 January 2004 by the Resolution No 60 of Government of the Republic of Lithuania	The main target set in the Strategy is to reduce relative consumption of thermal energy per unit of the used dwelling area by up to 30% by 2020 (compared with the year 2004) by modernization of heating system of the residential houses, renovation of roof constructions and other constructions.
4	**Law on Energy from Renewable Sources adopted** on 12 May 2011 by the Parliament of the Republic of Lithuania, updated in 2015.	The Law was adopted to ensure the balanced development of the RES. This Law establishes the tasks for separate energy sectors in order to reach the common goal of 23% of RES in the final consumption of energy by 2020. The Law also establishes the common promotion system on the enhancement of the use of RES and the following tasks by 2020 in separate energy sectors: • to increase the share of energy, produced from RES, not less than by 20% in comparison to the total country electricity energy consumption; • to increase the share of centralized provided heating energy, produced from RES, not less than by 60% in the balance of heating energy; • 10% RES energy consumption in transport sector; • and, to increase the share of RES used for heating in the households not less than by 80% in the balance of heating energy. The key support instruments for RES production are feed-in tariffs, also support scheme consisting of several support measures: • reservation of the capacity and transfer of energy grids or systems for connection of renewable energy installations; • discount of the costs of connection of renewable energy installations to energy grids or systems; • priority of transmission of energy from renewable sources; • support for production and processing of agricultural commodities, namely, raw materials for the production of biofuels, biofuels for transport, bio lubricants and bio oils; • support of investments in renewable energy technologies; • purchase of energy from renewable sources;

No	Title of document	Description of document
		.. After adoption of this Law, a mixed support measures model was chosen, where producers of small power plants has the fixed rate of the price and larger producers had to participate in an auction where they compete for quotas and for lowest desired fixed tariff price. Electricity produced from wind, solar and biomass power plants with the installed capacity not exceeding 30 kW was purchased at the fixed price (feed-in tariff) which is determined by the national regulatory authority. However, in order to avoid a significant distortion of the market and reduce financial burden on consumers in 2013 the important amendments of the Law on Energy from Renewable Sources have been made, for example: – The power of RES plant, for which the simplified requirements are applied, has been reduced from 30 kW to 10 kW. – Feed in tariff coefficients for all types of renewable sources have been reduced. – The rules for promotion have been changed. Feed in tariff has been applied from the production permit date, not development permit. In comparison from 2012 to 2014, feed in tariffs depending on the installed capacity have decreased: • wind power – 21-24% • solar – 56-62% • biomass – 38-40%. In December 2014, the Parliament of the Republic of Lithuania approved the amendments on Law on Energy from Renewable sources of the Republic of Lithuania allowing net-metering system application for small solar power plants (residential <10kW,budget and public institutions <50 kW). This law promoting solar energy use in households (by entering net-metering system) came into force on 2 March 2015.
5	**Energy Efficiency Action Plan** approved by Order No 1-149 of 30 May 2014 of the Minister of Energy of the Republic of Lithuania	Implementation of Energy Efficiency Action plan sets the indicative national energy efficiency target for 2020 (Article 3(1) of Directive 2012/27/EU) is 740 ktoe of final energy. The Plan sets complementary energy efficiency target - a general indicative national energy saving target of 9% by 2016 or 3 797 GWh (327 000 toe). Every year between 1 January 2014 and 31 December 2020 new energy savings must be ensured amounting to at least 1.5% of average annual energy sales to final customers. This target corresponds to the National Energy Independence Strategy determines the target to consume 1.5% less energy annually (to consume 17% less energy in 2020 compared to 2009 level).This target also involves modernization of buildings. In the plan the ongoing measures covering household, services, industry, energy and transport sectors as well as horizontal measures to enhance energy efficiency are prescribed. • In order to fully transpose provisions of **Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency** in to national law, in 2014 the draft **Law on Energy Efficiency** was prepared. In the draft law the system of energy efficiency is determined that commitment must to ensure that saved energy in the final consumption will reach 287 ktoe by 31 December 2020.
6.	**Multi-apartment Building Renovation (Modernization) Programme** approved by the Government of the Republic of Lithuania Resolution No 1213 of 23 September 2004	In 2009 essential adjustments of the Programme were adopted which have changed the financing rules. Due to this the modernization process was slowed down in 2009 while the owners of multi-apartment buildings were waiting for the determination of the new explicit rules for financing. However, in 2012 Programme of Modernization of Multi-apartment Buildings was changed again, this time enhancing implementation of actual modernisation projects. More detailed information is available in the National Reform Programme 2014. The main aim of the Programme is to reduce thermal energy use in multi-apartment buildings, built before 1993, at least by 20% by the end of 2020, i.e.

No	Title of document	Description of document
		estimated annual energy consumption in these buildings by the end of 2020 should be reduced at least by 1000 GWh/year, and reduce GHG emissions by 230 $ktCO_2eq$/year, comparing with 2005.
7.	**Programme of Public building renovation** approved by the Government of the Republic of Lithuania Resolution No 1328 of 26 of November 2014	The 2020 target set in this Programme is to renovate area of 700 000 m^2 of the public buildings by saving 60 GWh of the annual primary energy and to reduce GHG emissions by 14 $ktCO_2$. It is planned to renovate public buildings by reaching C class of building energy performance. In this Programme it is defined that the total area of public houses which are owned by the state and municipalities is 14.8 million m^2 (approximately 35% of all are non-residential buildings), for the heating all these building approximately 2 300 GWh of heat energy is used.
8.	The **Lithuanian Law on Heat Economy** adopted on 2003 by the Parliament (Seimas) of the Republic of Lithuania *and later amendments*.	The objective of this legal act is to reduce the unfavourable effect of heat energy on the environment by promoting combined heat and power generation, the heat generation from biofuels and renewable energy resources.
9.	The **Programme on Heat industry development in 2015–2021** adopted in 2015	The Programme determines trends of heat industry development and modernisation, technical solutions and energy mix for the production of the heat, demand and potential for higher efficiency cogeneration, investments and time frames. In Lithuanian cities, approximately 72 % of residential space is heated via centralized heating systems. It is forecasted that 5% will be reduced consumption of centralized heat by 2021 to compare with 2014 due to energy efficiency improvement in public and multi-apartment buildings.

BOX 3.2. ENERGY EFFICIENCY TARGET 2020 (6.5 Mtoe primary energy and 4.2 Mtoe final energy)



Source: European Commission, based on EUROSTAT and on national energy efficiency targets as declared by the MS under the EED

Lithuania's 2020 energy efficiency target is 6.49 Mtoe expressed in primary energy consumption (4.28 Mtoe expressed in final energy consumption). When comparing the trend of primary energy consumption with the GDP development over the past decades, it can be seen that there is evidence of a decoupling of both. Even if Lithuania's current primary energy consumption (5.7 Mtoe in 2013) is below its 2020 target, it could continue its current efforts regarding energy efficiency to keep the primary energy consumption at this level or increase it only slightly so that it will reach its 2020 target even if the economy continues to grow in the next five years.

Table 3-4. The main mitigation measures in Energy sector

Name of measure	Description	Year of implementation	Implementing entity
Promotion the use of renewable energy sources (RES) (except transport sector) (Group of PaMs). Policy impacting EU ETS and ESD emissions.			

Name of measure	Description	Year of implementation	Implementing entity
Increasing share of electricity generated from RES	Law on Energy from Renewable sources was adopted on 12 May 2011 by the Parliament of the Republic of Lithuania (updated in 2014) to ensure the balanced development of the RES in Lithuania. This Law establishes the tasks for separate energy sectors; for electricity sector the target is to increase the share of energy produced from RES no less than by 20 % in comparison to the total country's electricity energy consumption. The key support instruments for RES production are feed-in tariffs and discount for the connection to the grid, ect.	2013–2020	Ministry of Energy
Increasing share of district heating from RES	Law on Energy from Renewable sources was adopted on 12 May 2011 by the Parliament of the Republic of Lithuania (updated in 2014) to ensure the balanced development of the RES in Lithuania. This Law establishes the tasks for separate energy sectors; for district heating sector the target is to increase the share of centralized provided heating energy, produced from RES, no less than by 60 % by 2020 in the balance of heating energy. Heating from RES is promoted through several support schemes. These include the suppliers' obligation to purchase all heat produced from RES, grants in the form of subsidies from the Lithuanian Environmental Investment Fund (LEIF), as well as the environmental pollution tax reliefs. This target is also planned to be reached by implementing measures such as: modernization and development of co-generation plants, improvement of biomass mobilization and logistics systems, modernization of biomass fuel boilers and further development ect.	2013–2020	Ministry of Energy Ministry of Environment Ministry of Agriculture Ministry of Economy
Increasing share of renewable energy sources in the households	Law on Energy from Renewable sources was adopted on 12 May 2011 by the Parliament of the Republic of Lithuania (updated in 2014) to ensure the balanced development of the RES in Lithuania. This Law establishes the tasks for separate energy sectors; for the households sector it is defined to increase the share of RES used for heating in the households not less than by 80 % in the balance of heating energy. The main measure applied to implement this target is the change of an old or ineffective heating equipment in households into equipment using RES, this measures is project based and is financed from the Special Programme for Climate Change and the EU structural funds.	2013–2020	Ministry of Energy Ministry of Environment Ministry of Agriculture Ministry of Economy
Promotion of the RES use in industry sector	According to the Programme for investment incentives and industry development for 2014-2020 which was approved on 17 of September 2014 by the Resolution No 986 of the Government of the Republic of Lithuania it is planned to stimulate the use of RES in industry companies. Currently the financing schemes are developed.	2014–2020	Ministry of Economy
Sustainable forestry: Promoting the use of biomass for energy production	In the National Forest Area Development Program 2012-2020, approved by Resolution No 569 of the Government of the Republic of Lithuania of 23 May 2012, it is planned to use 300 thou. m^3 per year of wood from state forests for biomass production by 2020. The implementing measure is the financial support from EU structural funds to obtain new equipment for preparation of biomass for energy production.	2012–2020	Ministry of Environment Ministry of Energy Ministry of Agriculture
Increase of Energy Efficiency (Group of PaMs). Policy impacting EU ETS and ESD emissions.			
Voluntary agreements with energy companies	In the Energy Efficiency Action plan in 2014 the measure called “Obligations of energy companies to promote final energy efficiency” which includes provisions on the voluntary agreements. Voluntary agreements are signed between energy companies and Ministry of Energy. In the	2014-2016	Ministry of Energy

Name of measure	Description	Year of implementation	Implementing entity
	agreements energy producing plants are obligated to increase their energy efficiency for a particular years when the agreement is in force. In 2012 the energy saving in relation to these agreements reached 331.55 GWh, in 2020 it is planned that it will reach 357.58 GWh.		
Promotion of energy efficiency in industry	In the Programme for investment incentives and industry development for 2014-2020 which was approved in 17 of September 2014 by the Resolution No 986 of the Government of the Republic of Lithuania it is planned to implement energy efficiency measures and to reduce energy use in manufacturing industry from 222.9 (in 2012) to 182.9 (in 2020) kg of oil equivalent (for creation of 1000 EUR value added). In 2017 it is planned to reduce 144 000 kWh/year. The particular measures are being assessed. The programme will be financed from the EU structural funds.	2014–2020	Ministry of Economy
Renovation (modernization) of multi-apartment and public buildings	It is planned to reduce heating consumption in multi-apartment and public buildings by 30-40% by 2020 and compared to 2011 to save heat from 2 to 3 TWh per year. The financing for renovation (modernization) of multi-apartment and public buildings is provided from different financial schemes supported from Special Programme for Climate Change, JESSICA Holding Fund, and Energy Efficiency Fund. *The target of Multi-apartment renovation (modernization) program is to reduce heat energy use in multi-apartment buildings, built before 1993, not less that by 20% by 2020 (it is estimated approximately 4000 buildings), i.e. estimated annual heat energy saving should be 1 000 GWh per year by 2020 and reduce CO2 emissions 230 Gg per year compared to 2005. In the end of 2014 the Program on increasing of energy efficiency of public buildings was approved and the target to renovated 700 thous. m^2 of public building by 2020 was set. With this measure it is planned to save 60 GWh of annual initial energy amount and to reduce GHG emissions by 14 Gg.*	2014–2020	Ministry of Environment Municipalities Ministry of Energy Ministry of Economy Ministry of Interior Ministry of Finance
Reduction of the final energy consumption in transport sector	National Programme on the Development of Transport and Communications for 2014–2022 sets the goal to reduce energy consumption by 7.2% by 2017. The energy consumption saving in transport sector is planned to be increased by the modernization of infrastructure and public transport park, by implementing a special negative impact reducing measures and by promoting the use of alternative energy sources. It is planned regarding this measure in 2017 and 2022 to install 11 and 22, respectively, road lighting equipment with wind turbines, solar panels and accumulators, to buy 6 by 2017 and 9 by 2022 new generation diesel and 4 in each year electric trains as well as to expand the web of electric cars recharging stations by 19 in 2017 and by 28 in 2020.	2014–2022	Ministry of Transport and Communication Ministry of Environment

3.2.5.2 Transport

As it was mentioned before the National Renewable Energy Resources Development Strategy sets the target to increase use of renewable energy resources in transport sector from 4.3% in 2008 to 10% in 2020. A part of raw materials (mainly rape seeds and triticale) for biofuels production is compensated under the Lithuanian state aid scheme.

Lithuania started production of biofuel in 2004 and made about 4 kt of biodiesel that year and has made a considerable progress in developing biofuel production. In 2013 the volumes of biofuel production increased

to 141 kt. About 117 kt of biodiesel and 24 kt of bioethanol were produced that year. Respectively, about 365 kt of rape seeds and about 83 kt of triticale were used in the production of biofuel In 2014, Lithuanian producers produced 105.9 kt of biodiesel and 9.7 kt of bioethanol. Gross final consumption of electricity produced from renewable energy sources in the transport sector in 2013 the consumption – 60.1 ktne and in 2014 – 61 ktne. The main legal documents related to promotion of biofuels and climate change mitigation actions in transport sector are listed in Table below.

Table 3-5. The main legal documents related to climate change mitigation actions in transport sector

No	Title of document	Description of document
1.	The National Programme on the Development of Transport and Communications for 2014–2022 was adopted in 15 December 2014 by the Resolution No 1443 of Government of the Republic of Lithuania and replaced Long-term (until 2025) Strategy of Lithuanian Transport System Development, adopted on 5 June 2005 by the Government Resolution No 692 of the Republic of Lithuania	The strategic goal of the Programme is to create a sustainable, environmentally-friendly and competitive national transport and communications system with a high value-added creation potential. Upon attainment of the strategic goal, the transport and communications system would ensure a high-quality, efficient, uninterrupted and sustainable mobility of members of the public and goods' transportation as well as high-quality logistic and postal services. Objective 1 of the Programme: Increase mobility of goods and passengers, improve the corridors of the core network of the EU Trans-European Transport Networks as well as their connections with national and local transport networks, and increase the efficiency of multimodal transport. Objective 2 of the Programme: By means of the active transport policy measures, increase competitiveness of the transport sector and improve the transport and logistic service quality. Objective 3 of the Programme: Promote sustainability of the local (urban and suburban) transport system. Objective 4 of the Programme: Increase energy efficiency in transport and reduce the adverse impact of transport on the environment. Objective 5 of the Programme: Improve traffic safety and security.
2.	**Law on Energy from Renewable resources** adopted on 12 May 2011 by the Parliament of the Republic of Lithuania.	In this Law the goals for the promotion of RES use in transport sector are set: • to increase the share of RES (biofuels and electricity) not less than by 10 % in all modes of transport in comparison with the final consumption of the energy in the transport sector; • *Article 39. Blending of biofuel into the mineral fuels:* "No later than from 1st January 2013 at the fuel sales points shall be on sale the petrol which corresponds the requirements of the Republic of Lithuania and the European Union standards and which contains from 5 to 10 % of biofuels, and no later than from 1st January 2012 – diesel, which contains not less than 7 % of biofuels."
3.	The Order No 3-100 of the Minister of Transport and Communications of the Republic of Lithuania On the adoption of the **energy efficiency and environmental protection requirements for the purchasing of road vehicles and setting the cases when the ones are mandatory**	This legal act implements and transposes to national legislation the Directive 2009/33/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of clean and energy-efficient road transport vehicles (Official Journal, L 120, 2009, p. 5), and Directive 2006/32/EC on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC (Official Journal, L 114, p. 64).

No	Title of document	Description of document
4.	The Order of the Ministers of Environment, Social Security and Labour, and Transport and Communications **On the control of volatile organic compound (VOC) emissions resulting from the storage of petrol and its distribution from terminals to service stations** was adopted on 2000 and revised in 2011 *and subsequent amendments*	Implementing European Parliament and Council Directive 94/63/EC of 20 December 1994 on the control of VOC emissions resulting from the storage of petrol and its distribution from terminals to service stations (Official Journal, No L 365, 31/12/1994, p. 24). This act determining limitations for emissions of VOC from modern equipment of petrol storage, distribution and transportation.

Table 3-6. The main mitigation measures in Transport sector

Name of measure	Description	Year of implementation	Implementing entity
Promotion of renewable energy sources use in transport sector (Group of PaMs). Policy impacting EU ESD emissions.			
Electrification of railways	Railway electrification improves the economic indicators of railway carriers (the costs of energy resources are being reduced, the capacity of means of traction is increased), ecological tasks are being substantially resolved. The needs to electrify railway network are directly related to the intensity of train traffic and the programmes of renovation of means of traction. Lithuania is going to invest approximately 300 m EUR by 2020. For a moment there is only 122 km electrified railway route Naujoji Vilnia-Kaunas (7% of railways network). Currently project to electrify railway section Naujoji Vilnia - Kena (Belarusian border) is undergoing and should be finished during the first half of 2016. The electrification of the section between Naujoji Vilnia and the Lithuanian border with Belarus is the first phase of the project to electrify the entire railway line between Kena and Klaipėda. By 2030 it is planned to have 459.3 km (26% of railways network) of electrified railways in Lithuania and more than 3/4 of all freight and passengers will be transported using electric traction. Furthermore, until 2020 it is planned to prepare technical design for electrification of "Rail Baltica" line from Polish/Lithuanian border till Kaunas and up to 2025 build electrified "Rail Baltica" line from Polish/Lithuanian border to Lithuanian/Latvian border. After completion of "Rail Baltica" project, Lithuania will have around 360 km of fully electrified railway line, allowing transportation of passengers and cargo on south–north axis.	2014–2020	Ministry of Transport and Communication
Limitation of fuel use in transport sector	National Programme on the Development of Transport and Communications for 2014–2022 sets the goal to reduce energy consumption by 7.2% by 2017. The energy consumption saving in transport sector is planned to be increased by the modernization of infrastructure and public transport park, by implementing a special negative impact reducing measures and by promoting the use of alternative energy sources. It is planned regarding this measure in 2017 and 2022 to install 11 and 22, respectively, road lighting equipment with wind turbines, solar panels and accumulators, to buy 6 by 2017 and 9 by 2022 new generation diesel and 4 in each year electric trains as well as to expand the web of electric cars recharging stations by 19 in 2017 and by 28 in 2020.	2014–2020	Ministry of Transport and Communication Ministry of Environment

Name of measure	Description	Year of implementation	Implementing entity
Promotion the use of bicycles and development of bicycle track's infrastructure	National Programme on the Development of Transport and Communications for 2014–2022 sets the goal to develop 564.3 km of bicycle tracks in urban and suburban areas in Lithuania. The Programme sets the objective to encourage more efficient development of bicycle tracks in towns: by creating unbroken bicycle web system integrated into common transport system, reaching that pedestrians and web of bicycle tracks development would be engaging and safe for its users.	2014–2020	Ministry of Transport and Communication Municipalities Ministry of Environment Ministry of Interior
Promotion of the use of public transport and improvement of its infrastructure	National Programme on the Development of Transport and Communications for 2014–2022 sets the goal to increase number of passengers traveling by public transport from 234.9 mln in 2012 to 244.0 mln in 2022. In order to reach these parameters it is planned to increase the attractiveness of public transport vehicles, to improve public transport infrastructure by introducing universal design solutions that increase the availability etc. Since 2010, Lithuania has implemented support schemes (from the EU Cohesion Fund) for environmentally friendly public transport in the 5 biggest cities: Vilnius, Kaunas, Klaipėda, Panevėžys and Šiauliai. The measures encompass renewal of public transport fleet (buses and trolleybuses), park and ride lots, bicycles and ride facilities, deployment of bus lanes, cycle tracks, and bike-sharing schemes. Passenger coach renewal programme has been pursued by the SC "Lithuanian Railways".	2014–2020	Ministry of Transport and Communication Ministry of Interior Municipalities
Improvement of road infrastructure	National Programme on the Development of Transport and Communications for 2014–2022, adopted in 15 December 2014 by the Resolution No 1443 of Government of the Republic of Lithuania, sets the goal to improve national roads infrastructure. One of the main measures in this case is to cover the gravels roads with an asphalt; the gravel roads consist 33% of the total road network in Lithuania.	2014–2020	Ministry of Transport and Communication

Additional measures influence the GHG emissions in transport sector

Following the Government Resolution of the Republic of Lithuania on the National Green Investment Program (2007) it is identified that companies which provides transport service should apply the main environmental criteria in relation of buying transport equipment as well as transport services.

By the Decision No 1436 of the Government of the Republic of Lithuania dated 28 November 2012 the Rules of the Road have been supplemented with new road signs:

1) On the traffic lane marked with 4+ symbol (horizontal road marking) is allowed to travel by car, which has 4 or more users (driver and passengers)

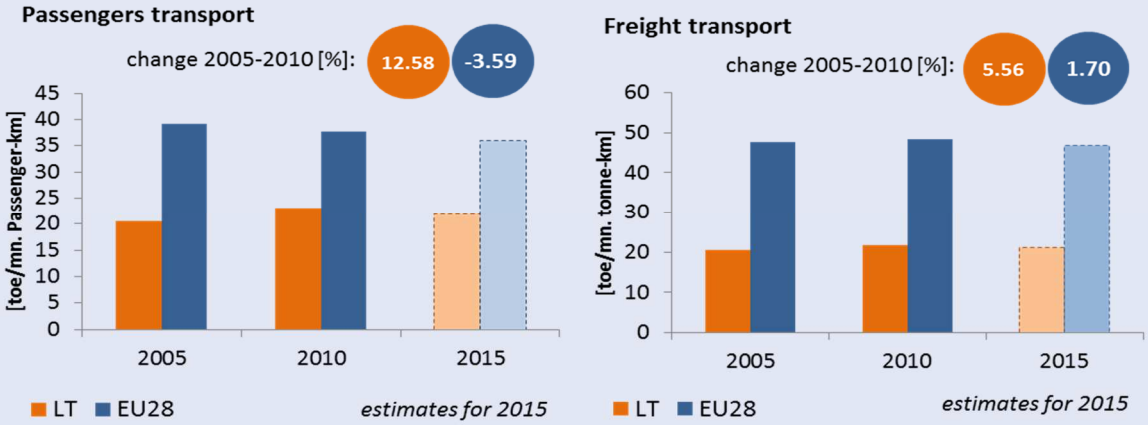
2) On the traffic lane marked with the electric vehicle or electric plug symbol (horizontal road marking) is allowed to travel only by electric vehicles

3) The road sign No 855 Excluding electric vehicles means that the other main sign, to which sign No 855 is attached, does not apply to electric vehicles.

The new road signs are used to encourage residents to share their vehicles with others (for example, when travelling to work to give a lift to neighbours or friends, that would help to reduce the number of vehicles and

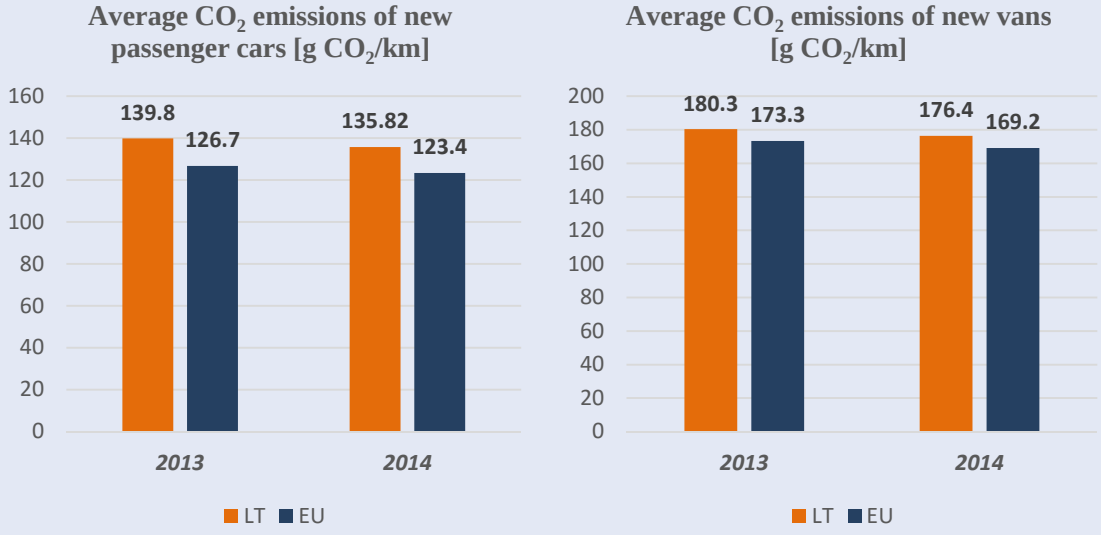
the level of air pollution during peak hours), as well as to promote using of electric vehicles, which have zero-emission of CO_2 and other pollution.

BOX 3.3. In future Lithuania will have to endeavour for the implementation additonal measures in order to reniew pasangers car fleat and adjust taxation policy towards performance of the environmental standards. Lithaunia's the energy intensity of transport is below EU average. This is however difficult to interpret as Lithuania has one of the most inefficient car fleet in Europe. The average age of passenger cars is around 14 to 15 years and the emission levels of newly registered cars are among the highest in the EU (140 g CO_2/km against an EU average of 127 g CO_2/km). There is no car taxation in place and taxes on transport fuel are among the lowest in the EU.



Specific energy intensity for passenger cars and freight transport[4]
Source: PRIMES model background data and estimations based on EU Commission and EU MS inputs

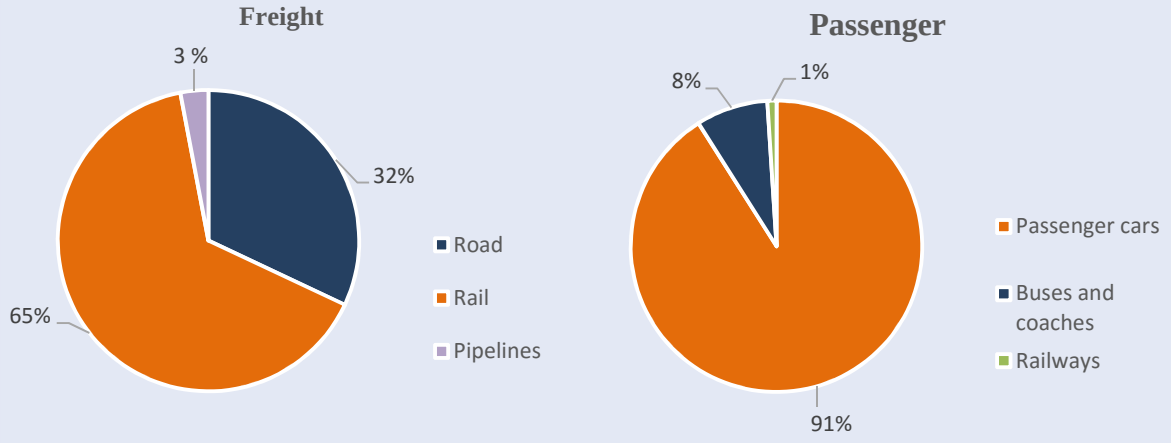
EU legislation sets mandatory CO_2 emission reduction targets for new cars and vans. By 2021, the fleet average to be achieved by all new cars is 95 grams of CO_2 per kilometre. For new vans, the fleet average is set at 147 g/km by 2020.



Source: European Environmental Agency. 2014 values are provisional. 2013 EU average refers to EU-27

Regarding transport performance, in EU-28 the inland freight modal shares are 71% by road, 17% by rail, 7% by inland waterways and 5% by pipelines. The respective inland passenger modal shares are 82% by private car, 9% by buses and coaches, 7% by railways and 2% by tram and metro. In Lithuania, as in the other Baltic States, rail is widely used in freight transport. However, passenger transport is mostly performed by road.

4 Statistics on energy demand for passengers and freight transport are not available and model estimates have been used instead. These issues should be borne in mind when comparing energy intensity in freight or passenger transport between Member States, which should be regarded as merely indicative.



Modal shares Lithuania

Source: Eurostat and EU transport in figures 2015. Data refers to 2013. Modal shares based on tonne-kilometres for freight sector and passenger-kilometres for passenger sector, freight data based on activity within country territory. Estimates are made when data is missing.

3.2.5.3 Industrial Processes

The policies and measures in industry sector are based on few main principles which are required in order to reach environmental targets. Firstly, the amount of its waste should be reduced, the production should be more sustainable, natural and energy resources should be used efficiently. Secondary, raw materials should be processed, the multi-use packaging and materials should be produced and utilized, waste (especially hazardous) should be securely managed, and equipment needed for environmental protection should be manufactured.

The legal documents and measures covering these issues in industrial sector are provided in Table 3-7.

Table 3-7. The main legal documents and measures related with climate change mitigation in industry sector

No	Title	Description
1.	**The Programme for investment incentives and industry development for 2014-2020** was approved in 17 of September 2014 by the Resolution No 986 of the Government of the Republic of Lithuania.	In this programme an objective to encourage enterprises to use recourses and energy more efficiently as well as use of RES is set. It is planned to implement energy efficiency measures and to reduce energy use in manufacturing industry from 222.9 (in 2012) to 182.9 (in 2020) kg of oil equivalent (for creation of 1000 EUR value added). Additionally, Ministry of Economy of the Republic of Lithuania currently prepared a study on "The potential of energy use efficiency increase in industry enterprises and determination of measures which encourage the use of different types of energy" in 2015. The Study concluded that the economic energy saving potential is 480.43 ktoe, i.e. 32.78% of the total technical potential. Most cost-effective savings can be achieved by effectively utilising waste heat sources (49.96% of the total economic saving potential), by increasing the efficiency of electricity-consuming systems installed in enterprises (pumps, fans, lighting etc.) (29.05%), as well as in the heat/steam generation facilities installed in industrial enterprises (20.99%). To achieve economic potential, during the period of 2014-2020, EUR 198.30 m should be invested, thus annually saving EUR 11.30 m of new energy. Taking into account the target goal laid down in the Energy Efficiency Action Plan approved by Order No 1-149 of 30 May 2014 of the Minister of Energy of the Republic of Lithuania to save 11.677TWh of the final energy in the total Lithuanian final energy consumption balance, upon economic assessment, nearly half of this

No	Title	Description
		amount (approximately 48% or 5.587TWh) can be achieved through the installation of various energy efficiency measures in the industry sector.
2.	**IPPC permits and Pollution permits**	The Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) and the Directive 2008/1/EC of the European Parliament and of the Council of the 15th January 2008 concerning integrated pollution prevention and control (IPPC) are transposed into the national legislation by the following legal acts: The Law on Environmental Protection (1992 and letter amendment 2013) and the Oder No D1-528 of 15 July 2013 of the Minister of Environment on the Approval of the Rules on the Issue, Replace and Repeal of Validity of the Integrated Pollution Prevention and Control Permit (IPCC). The Law on Environmental Protection sets provisions on the issue replace and repeal of IPCC permits and Pollution permits. In transitional period the Rules on the issuance, renewal and cancellation of IPPC permits (2002 with later amendments) was valid for the issue of permits for the activities not covered by the Directive 2010/75/EU before rules on issue Pollution permits came into force from 1 July 2014. Industrial enterprises must apply for the IPPC permit for pollution prevention and cleaner technologies to ensure the quality of environment. Natural resources must be used rationally and sparingly, energy use must be efficient and monitoring, and control must be performed for the substances and raw materials, fuel and energy consumption in the processes of production. Less hazardous materials are promoted to use in the process of industrial activities. Additionally, encourage the implementation of environmental management system in industrial enterprises. The companies having ISO 14001:2005 are not obliged to prepare the natural resources protection and waste reduction plan. GHG emissions permits issued for the installations participating in the EU ETS are consistent part of the IPCC permits or Pollution permits. After the 7 January 2013, when Directive 2010/75/EU came to force, IPCC conditions for certain installation shall be set using Best Available Technologies conclusions as a reference document. As it is set in the Directive 2010/75/EU emission limits shall be based on BAT without prescribing the use of any technique or specific technology. The term “best available techniques” includes both the technology used and the way in which the installation is designed and maintained. The presented techniques are developed in the scale that allows implementation under economically and technically viable conditions and the techniques are most effective in achieving a high general level of protection of the environment as whole.
3.	**Regulation of Fluorinated Greenhouse Gases**	In 2014 a new Regulation (EU) No 517/2014 of the European Parliament and of the Council on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006 was adopted. The main goals of the new Regulation is to ensure a more cost-efficient contribution to achieving the EU’s climate objectives by discouraging the use of F-gases with a high impact on the climate in favor of energy-efficient and safe alternatives, and further improving the containment and end-of-life treatment of products and equipment that contain F-gases; help to bring about a consensus on an international agreement to phase down hydrofluorocarbons (HFCs), the most relevant group of F-gases, under the Montreal Protocol. The Ministry of Environment of the Republic of Lithuania has already taken actions in order to updated the existing national legislation in the area of fluorinated greenhouse gases ensuring the implementation of the requirements of the Regulation (EU) No 517/2014 : 1. The Order No D1-957 of the Minister of Environment the Republic of Lithuania ensuring the implementation of the requirements of the

No	Title	Description
		containment, use, recovery and destruction of the fluorinated greenhouse gases was adopted on 27 November 2014; this order defines the functions of the national authorities ensuring the implementation of the requirements of the new Regulation(EU) No 517/2014; 2. The Order No D1-372 of the Minister of Environment of the Republic of Lithuania establishing the Rules on the issuance of Certificates for the companies handling fluorinated greenhouse gases was updated on 19 December 2014; 3. The Order No D1-393 of the Minister of Environment of the Republic of Lithuania establishing the training and attestation system for the employees engaged in the activities with the fluorinated greenhouse gases was prepared with the view to amend and updated the existing national legislation in this area in order to comply with the requirements on the new Regulation (EU) No 517/2014 was adopted on 8 May 2015. 4. The Order No D1-12 of the Minister of Environment establishing the procedures for reporting on fluorinated greenhouse gases and ozone depleting substances, data collection and management, accounting of equipment and systems which contain these gases or materials was adopted on 10 January 2010 and amended by the Order No D1-394 on 8 May 2015. 5. The amendment to the Administrative Infringement Code establishing more stringent responsibilities for the breach of the requirements of handling fluorinated greenhouse gases was drafted in 2015. The adoption of the amendment by the Parliament is pending.
4.	The Order No D1-973 of the Minister of Environment **on the green procurement implementation measures for 2012-2015** adopted on 14 December 2011 and later amendments.	Promoting the environmental management system in the manufacturing sectors as well as the strengthening ability of enterprises to organise green procurements.
5.	The Order No 620 of the Minister of Environment of 5 December 2002 (with later amendments) On **limitation of emissions of volatile organic compounds (hereinafter – VOC)** was established and proceeds due to the use of organic solvents in certain activities and installations.	The aim of this order is to reduce the direct and indirect impact of VOC emissions (released by paints, solvents, adhesives and other products) on environment, usually on the ambient air, and the potential risk on human health, by providing measures and procedures to be implemented in the activities referred to by this document, in case the activity exceeds the solvent consumption level prescribed in this normative document. The pollution reduction scheme is a part of the procedure of the limitation of emissions of VOC due to the use of organic solvents in certain activities and installations. The scheme is approved and included as Annex 3. The aim of this scheme is to give a possibility to an operator by using various implements to reduce VOC emission levels at the same degree as it would be reduced if the VOC emissions satisfied the limit levels. In this case, the operator may use any reduction scheme, prepared specially to his equipment to achieve an ultimate equivalent effect of VOC emission reduction.

3.2.5.4 Agriculture and Forestry

The biggest focus in the Agricultural and Rural Development Strategy is on the environmental protection and ecological farming nurturing the biodiversity and landscape. The implementation measures were foreseen in the **Rural Development Programme for Lithuania 2007-2013**, adopted in the EU Rural Development Committee on 19th of September in 2007. Implementing the Programme the non-food agricultural production, ecological farming, liquidation of the pollution, partial financing of the construction of manure yards,

conversion of unusable land into pastures or its afforestation, and reduction of nitrate pollution were strongly emphasized. Furthermore, the cultivation of energy plants was promoted as well as reconstruction of boilers for utilization of fuel from unsorted wood and other organic waste. The measure of ecological farming enables the reduction of GHG emissions to the atmosphere due to the stringent control exercised over the use of fertilizers for crop rising, thus reducing direct and indirect N_2O pollution out of agricultural activities.

Lithuania's Rural Development Programme for 2014–2020 period was approved by European Commission on 13 February 2015. In 2014 **Lithuania's Rural Development Programme 2014-2020** was prepared by the Ministry of Agriculture of the Republic of Lithuania (MoA) in cooperation with the Ministry of Environment in fulfilment mission and objectives laid down in the Articles 3 and 4 of the European Parliament and the Council Regulation (EC) Nr. 1305/2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and repealing Council Regulation (EC) No 1698/2005. In order to achieve the objectives of rural development, which contribute to the Europe 2020 strategy for smart, sustainable and inclusive growth, the main target of the National Rural Development Programme is promoting growth of agriculture sector based on innovative technologies, that is more territorially and environmentally balanced, climate-friendly and resilient and competitive as well as innovative. Therefore, all three objectives of the EAFRD will be implemented: (a) fostering the competitiveness of agriculture; (b) ensuring the sustainable management of natural resources, and climate action; (c) achieving a balanced territorial development of rural economies and communities including the creation and maintenance of employment.

Implementation of the Council Directive of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (91/676/EEC) with the latest amendment by the Regulation (EC) No 1137/2008 of the European Parliament and the Council of 22 October 2008 (further – Nitrates Directive) is primarily directed towards the minimization of the water pollution with nitrates. Activities are supported for the establishment of modern manure silos and other measures which enable the control against manure penetration into the surroundings. Replacement of manure handling systems from thick or dry silos to liquid silos may lead to a reduction in emission of nitrogen compounds to atmosphere by up to 20 times. The country took an obligation that the Nitrates Directive would be implemented in two phases. The implementing Nitrates Directive legal documents are provided in Table 3-8.

Table 3-8 The implementing Nitrates Directive legal documents in Lithuania

No	Title of document/measure	Description of document
1.	The Order No D1-367/3D-342 of Ministers of Environment and Agriculture **On environmental requirements for manure management** adopted on 14th July 2005 *and subsequent amendments*.	The Order No D1-367/3D-342 of Ministers of Environment and Agriculture on environmental requirements for manure management adopted on 14 July 2005 with later amendments sets requirements pursuant to Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agriculture activities, particularly the environmental requirements on the use of manure for croplands fertilization. Additionally, the farm, keeping animals are required to store manure and slurry in storage vessels which comply with environmental requirements. In order to reduce greenhouse gas emission, also there are established requirements for slurry storage covering and slurry speeding technology in the Order No D1-367/3D-342.
2.	**The Program for Minimization of Water Pollution Caused by Agriculture activities,** adopted on 8th June 2012 by the Order No D1-490/3D-39 of Ministers of Environment and Agriculture.	By the Order No D1-490/3D-39 of Ministers of Environment and Agriculture the Program for Minimization of Water Pollution Caused by Agriculture activities was adopted on 8 June 2012. The Oder sets requirements pursuant to Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources:

No	Title of document/measure	Description of document
		1. The nitrogen input to soils per calendar year must not exceed 170 kg per hectare (fertilization with the application of manure or slurry of grazing animals). 2. Farms keeping animals must store manure and slurry in the manner which would ensure the prevention of surface and groundwater. 3. Spreading manure and slurry from 15 November to 1 April (in the cold season), as well as on frozen, water-saturated, flooded or snow-covered ground, is forbidden. 4. Spreading manure and slurry from 15 June to 1 August is forbidden with the exception when it is done with the purpose of fertilizing the fallow, pastures or areas which are designated for growing winter crops.

Table 3-9 The main mitigation measures in Agriculture sector

Name of measure	Description	Year of implementation	Implementing entity
Implementation of Nitrate directive. Policy impacting EU ESD emissions.			
Promotion of the production of biogas from livestock holdings (Improved animal waste management systems)	The support for biogas production from livestock holdings waste is foreseen under the sub measure "Support for production of biogas from agricultural and other waste" of the measure "Farm and business development" of the Rural Development Programme for Lithuania 2014–2020. The planned biogas production capacities from livestock holdings in 2020 is expected to reach 20 MW of electrical power.	2014–2020	Ministry of Agriculture
Promotion of planting of short rotation coppices (Other activities improving cropland management)	The support for planting of short rotation coppices with an aim to produce biomass as a source of energy which partially replaces imported raw materials (oil, gas, coal) and contributes to the reduction of CO_2 emissions. In 2007-2013 period under National Rural Development Program 0.6 million EUR is paid out for short rotation coppices. The continuation of support for planting of short rotation coppices is foreseen under the sub measure "Investment to agricultural holdings" of the measure "Investments in physical assets" of the Rural Development Programme for Lithuania 2014–2020.	2007–2020	Ministry of Agriculture Ministry of Energy
Maintenance of permanent grasslands (Activities improving grazing land or grassland management)	As all Member States of the EU, from 2015 Lithuania is implementing the compulsory Greening payment as a part of the Direct Payment scheme (Common Agricultural Policy's Pillar I). The payment is granted to farmers if they meet 3 requirements: crop diversification (at least 2 or 3 different crops – depending on the size of the farm – grown in arable land), maintenance of permanent grasslands and designation of at least 5 % of the arable land to ecological focus area.	2014–2020	Ministry of Agriculture
Promotion growth of protein crops	To fulfil ecological focus area requirements farmers will be allowed to grow protein crops which are crucial in sustaining the nitrogen in the soil. Farmers will also be encouraged to grow protein crops by additional financial incentives available under the voluntary coupled support scheme. Under	2014–2020	Ministry of Agriculture

Name of measure	Description	Year of implementation	Implementing entity
	this scheme farmers will receive additional payments for the areas where selected protein crops are grown. The total coupled support for protein crops in Lithuania amounts from about 14 million EUR (about 213 EUR/ha) in 2015 to about 17 million EUR (about 254 EUR/ha) in 2019 due to external convergence of direct payments across the EU Member States.		

3.2.5.5 Land use, Land use Change and Forestry

In the land use, land use change and forestry (hereinafter – LULUCF) sector one of the main factor influencing the CO_2 absorption is the forest expansion. **National Forest Area Development Program 2012–2020** approved by Resolution No 569 of the Government of the Republic of Lithuania on 23 May 2012, sets a strategic goal on forestry development, other forestry goals, and tasks to achieve the set goals, evaluation criteria. In the Annex the implementation evaluation criteria for the years 2011, 2015 and 2020 are set. The Programme is sought to increase forest coverage of the country up to 34.2 % by 2020 by afforestation of abandoned lands and lands that are not suitable to be used for agricultural activities, and to encourage people financially to plant forests in private and state-owned lands, to develop forest regeneration on a genetic-ecological basis with selectively valuable and qualitative forest increasing matter.

The main legal act regulating forest management is the Law No XI-1830 on Forests adopted by the Parliament (Seimas) of Republic of Lithuania on 2011. By the amendments of this legal act the new measures were invented, that creates legal conditions for better preserving of forests and forest land in cases of land use change from the forestry to other use, in particular: the number of cases when it is allowed to change forest land in to any other land is narrowed and prescribed precisely.

The compensatory afforestation in all cases of changing forest land in to any other land was established under the National Forest Area Expansion Program 2012–2020**,** adopted on 23 May 2012 by the Government Resolution No 569 of the Republic of Lithuania.

The estimation of policy and measures effect on GHG emissions mitigation in LULUCF sector effect is basically related to the National Forest Area Expansion Program 2012–2020 where the target to increase the forest area by 3 % by 2020 is set.

Table 3-10. The main mitigation measures in LULUCF sector

Name of measure	Description	Year of implementation	Implementing entity
Increasing the national forest area The National Forest Area Development Program 2012-2020 approved by Resolution No 569 of the Government of the Republic of Lithuania of 23 May 2012 is sought to increase forest coverage of the country up to 34.2 % by 2020. To increase forest area by 3% until 2020. **LULUCF sector is not part of any EU goals until 2020.**			
Restoration of forestry potential and introduction of prevention actions	Fires and natural disasters pose a significant threat to forest ecosystems. Each year in Lithuania between 100 and 750 hectares of forest is burned. Lithuania's Rural Development Programme 2014-2020 provides investment support for restoration of forest damaged by fires and other natural disasters including pests and diseases, as well as support for implementation of forest fire prevention measures.	2014–2020	Ministry of Environment

Name of measure	Description	Year of implementation	Implementing entity
Afforestation and restoration of damaged forest	In order to reduce atmospheric pollution originated from agricultural activities and contribute to climate change mitigation as well as to reduce the area of the abandoned land, the afforestation of these lands and the restoration of damaged forests is supported. In the inter-institutional Action Plan on the implementation of the Goals and Objectives for 2013-2020 of the Strategy for the National Climate Change Management Policy the measure is set to plant new economically valuable and productive as well as biological resistant forests in abandoned lands in the state's possession.	2014–2020	Ministry of Environment
Afforestation	Afforestation actions are supported by Lithuania's Rural Development Programme 2014-2020. 53 mln Eur allocated for new commitments under the sub-measure „Afforestation" for the programming period 2014-2020.	2014–2020	Ministry of Agriculture

3.2.5.6 Waste

The main legal acts and programs of the Republic of Lithuania regulating waste management activities include the Law on Waste Management (1998, with later amendments), Law on Management of Packaging and Packaging Waste (2002, with later amendments), the Law on Taxes for Environment Pollution (2002, with later amendments), the Rules on Waste Management (1999, with later amendments) and the National Waste Management Plan for 2014–2020 (2014). Management of wastewater and sludge is regulated by the Law on Potable Water Supply and Wastewater Handling (2006, with later amendments) and the Development strategy of Potable Water supply and wastewater handling 2008-2015 (2008, with later amendments).

The National Strategic Waste Management Plan 2007–2013 was repealed in April 2014 with the National Waste Management Plan for 2014–2020 by Resolution No 519 of the Government Republic of Lithuania. The targets, directly related to minimisation of GHG emissions in waste sector remains the same, however, stricter measures are set in order to reach those targets. For example, introduction of the Landfill tax since 2016, more requirements for kitchen and food waste treatment, reduced disposal of biodegradable waste and waste containing energy/calorific value in landfills till 2030. Several new biogas plants have been constructed in waste water treatment plants. In 2013 first waste incineration plant in Lithuania has started operation with energy recovery.

The main measures related to reducing GHG emission in waste sector is provided in Table below.

Table 3-11. The main current mitigation measures in Waste sector

Name of measure	Description	Year of implementation	Implementing entity
Decreasing the amount of biodegradable waste in landfills	The National Strategic Waste Management Plan 2007–2013 was repealed in April 2014 with the National Waste Management Plan for 2014–2020 by Resolution No 519 of the Government Republic of Lithuania. This planned to lower amount of landfilled of biodegradable municipal waste ensuring that biodegradable municipal waste would make no more than 35 % until 2020,	2014–2020	Ministry of Environment Regional waste management centres

Name of measure	Description	Year of implementation	Implementing entity
	if compared with the year 2000 quantities of the biodegradable municipal waste. Regarding this PaM 49 of green waste composting sites were installed and it is planned to install 4 more. In 2012 in these 49 waste composting sites 40 000 tonnes of green waste was composted. The National Waste Management Plan for 2014–2020 sets the goal by the 2030 that approximately 100 000 t of green waste will be composted.		
Promotion of municipal and industrial waste incineration	In the National Waste Management Plan for 2014–2020 it is planned to incinerate 180 000 t of waste in 2015 and in 2020 it is planned to incinerate 360 000 – 530 000 t; Potential reaches 150–210 ktne in 2020. In 2013 first waste incineration plant in Lithuania has started operation with energy recovery in Klaipeda. It is planned to build two more waste and biomass burning co-generation power plants. Based on evaluations, the thermal capacity of cogeneration power plants complex in Vilnius, fired by waste and biomass, could reach a total of 240 megawatts (MW) and the electrical capacity could reach a total of 145 MW. The similar complex in Kaunas could reach a total of 130 megawatts (MW) and the electrical capacity could reach a total of 53 MW.	2014–2020	Ministry of Environment Private sector Ministry of Energy
Promotion of municipal and other waste recycling or using otherwise	The National Waste Management Plan for 2014–2020 sets the goal that by 2020, the preparing for re-use and the recycling of waste materials at least paper, metal, plastic and glass from households, and possibly from other origins as far as these waste streams are similar to waste from households, shall be increased to a minimum of overall 50 % by weight. It is also defined that by 2020, the preparing for re-use, recycling and other material recovery, including backfilling operations using waste to substitute other materials, of non-hazardous construction and demolition waste, excluding naturally occurring material defined in category 17 05 04 in the list of waste, shall be increased to a minimum of 70 % by weight. The measures implementing these targets are funded from Product or packaging waste management program (fund is accumulated by collecting the tax on environmental pollution with products and/or packaging waste) from which are supported electronic waste recycling and public awareness raising projects; and from Lithuanian Environmental Investment Fund program (fund was accumulated by collecting tax on environment pollution from stationary and mobile sources) which subsidize measures reducing negative impact on the environment by implementing modern technologies for waste recycling and for other measures.	2014–2020	Ministry of Environment Municipalities Regional waste management centres
Promoting the extraction and use of biogas from landfills.	According to the data of the Regional waste management centres and the National Waste Management Plan for 2014–2020 it is planned to extract approximately 13 mln. m^3 of biogas from	2014–2020	Ministry of Environment

Name of measure	Description	Year of implementation	Implementing entity
	all landfills. It is planned to build 4 biological treatment plants with biogas production in Alytus, Panevėžys, Telšiai and Utena regions till the end of 2015.		Regional waste management centres

3.3. Estimation of mitigation measures effects

There are different ways to calculate impact of policy and measures. According to the Outline for the NC5, prepared by the UNFCCC Secretariat, Parties should also include, as appropriate: a quantitative estimate of the effects of individual policies and measures, or set of policies and measures. In order to avoid double counting, we have chosen to apply top-down approach and calculate impact of energy efficiency measures by evaluating the impact of national binding targets, meaning impact of collection of policies and measures (top-down approach).

For example, energy efficiency measures, such as renovation (modernization) of multi-apartment buildings, modernization of public buildings are covered by calculations presented in the estimations of Energy sector policy impact on GHG emissions. The same approach we used for renewable energy projects. As national renewable energy target is determined and impact of implementation of the target on the GHG emissions reduction is evaluated. Biogas plants, the waste incineration plant (bioenergy part) in Klaipeda are covered by this evaluation. LNG driven public buses are not included in current evaluation, however after the projects will be implemented, the report on actual reduction of GHG emissions verified by the independent authority, will be prepared and submitted to the Lithuanian environmental investment fund. Limitation of VOC emissions was not evaluated as there is no sufficient statistical data for reliable evaluation. Railway electrification was not included in evaluation due to lack of the clear plan for this process and amounts, thus making it impossible to perform reliable evaluation.

- **Promotion the use of renewable energy sources (except transport sector) (Group of PaMs).**

  Policy impacting EU ETS and ESD emissions.

  The estimation of the effect:

The projected amounts of RES are multiplied by the GHG intensity that was calculated as GHG emissions from Energy industries (1.A.1) ratio to aggregated activity data. Since the aggregated activity data is primary energy and projected consumption of RES in final energy, the final energy consumption was recalculated to primary energy consumption applying conversion factors (a default 2.5 ratio is applied for electricity and 1.0 for other energy consumption). The applied GHG intensity is 191.34 $GgCO_2eq/TWh$ (0.00532 $GgCO_2eq/TJ$).

- **Increase of Energy Efficiency (Group of PaMs).**

  Policy impacting EU ETS and ESD emissions.

  The estimation of the effect:

The National Energy Independence Strategy determines the target to consume 1.5 % less energy annually (to consume 17 % less energy in 2020 compared to 2009 level). This target also involves modernization of buildings. Implementation of Energy Efficiency Action plan provides for final energy savings to amount to 740 ktoe of final energy in 2020 and a general indicative national energy saving target of 9% by 2016 or 3 797 GWh (327 ktoe). In order to fully transpose provisions of Directive 2012/27/EU of the European

Parliament and of the Council of 25 October 2012 on energy efficiency in to national law, in 2014 the draft Law on Energy Efficiency was prepared. In the draft law is determined that the system of energy efficiency commitment must to ensure that 31 December 2020 saved energy in the final consumption will reach 287 ktoe and also energy saved by renovating multi-apartment and public buildings will be included. By the end of 2012, a total of 1 603 GWh (138 ktoe) was saved, i.e. during the period of five years (2008–2012), 42 % of the required amount was saved. About 27 % of all savings was achieved through the signed voluntarily agreements between the Ministry of Energy and energy companies.

Based on goals set in the National Energy Independence Strategy the energy savings for 2020 is projected to be approximately 8 548 GWh. The main assumptions for emission reduction due to energy efficiency are that the emissions intensity of final energy consumption (including transportation and distribution losses and consumption in energy industries) according to the GHG NIR 2013 for 2010 data 0.0515 $GgCO_2eqv/TJ$, and for 2011 and later years 0.0486 $GgCO_2eqv/TJ$ is applied (drawn from the GHG Inventory).

- **Promotion of renewable energy sources use in transport sector (Group of PaMs).**

  Policy impacting EU ESD emissions.

The Law of the Republic of Lithuania on Renewable Energy Resources was adopted on 12 May 2011 by the Parliament of the Republic of Lithuania (updated in 2015) to ensure the balanced development of the RES in Lithuania. This Law establishes the tasks for separate energy sectors; for transport sector the target is to increase the share of RES (biofuels and electricity) by 10 % in all modes of transport in comparison with the final consumption of the energy in the transport sector.

The requirements for blending of biofuel into the mineral fuels are: in petrol fuel the content of biofuels has to be from 5 to 10 % and in diesel fuels not less than 7 %. However, after the amendment of the Fuel Quality (Directive 98/70/EC) and the Renewable Energy (Directive 2009/28/EC) Directives in order to reduce the risk of indirect land use change (ILUC), the amount of food crop-based biofuels and bioliquids that could be counted towards the EU's 10% target for renewable energy in the transport sector by 2020, was limited to 7% up to 2020, when the Directive (ILUC) will be implemented, while keeping the overall renewable energy and carbon intensity reduction targets, the remainder (3%) will have to come mainly from second generation biofuels or other sources such as electricity[5]The RES use in the transport sector is promoted through the reimbursement, by the National Paying Agency of the Ministry of Agriculture, of raw materials for biofuel production, an excise tax relief and an exemption from environmental pollution tax. The National Programme on the Development of Transport and Communications for 2014–2022 set the goal to promote the use of alternative fuels and technologies and set the target to reach that from sold new cars 6% will be electric vehicles in 2022.

Additionally, if the liquefied natural gas is used as a fuel in local public buses engines it is exempt from the excise tax (The amendment of Law on Excise duty, Art. 581 art. 1 part).

The estimation was performed by using the bottom-up approach. The following assumptions to evaluate the effect of GHG mitigation measures in the transport sector were included: emission factor equal to 0.07 $GgCO_2/TJ$; the energy amount replaced with RES in 2010 equals 2520 TJ, in 2015 and 2025 equals 4547 TJ and 6574 TJ, respectively; and, finally, the initial energy conversion coefficient equals 1.076.

- **Implementation of Nitrate directive.**

[5] More information: http://ec.europa.eu/energy/en/topics/renewable-energy/biofuels/land-use-change and http://biofuelstp.eu/biofuels-legislation.html

Policy impacting EU ESD emissions.

The assumed effect of implementation of Nitrate directive; in the impact assessment of this directive it was predicted that in each year from the starting year of directive implementation, which is 2004, the reduction of GHG might be 0.1 million tonnes of CO_2eqv. The exact area wasn't defined and was assumed that the effect will occur at the national level. For the implementation of this Directive measures such as manure management in the biogas tanks, organic farming, growing of protein crops and other are included.

The effect of other PaMs was evaluated based on the opinion of the experts.

The estimated reduction of GHG emissions after the implementing the strategic goals or other policies are presented in the Annex CTF Table 3.

3.4. Information on the assessment of the economic and social consequences of response measures

Under Article 3.1 of the Kyoto Protocol and UNFCCC Decision 31/CMP.1, Annex I Parties shall report on how they are striving to implement the commitments, together minimizing adverse social, environmental and economic impacts on developing country Parties. And according to the BR reporting guidelines (2/CP.17) Annex I party is encouraged to provide, to the extent possible, information on the assessment of the economic and social consequences of response measures.

Annex I countries, including Lithuania, implement a great number of various actions that are taken in the framework of the Kyoto Protocol, aiming to substantially reduce GHG emissions and to contribute to the prevention of climate change. Lithuania puts efforts on promoting the use of renewable energy and increase of energy efficiency, takes measures that reduce the use of fossil fuel and have no adverse impact on environment or economy of the other countries.

As an example, there are several initiatives applied in Lithuania in order to prevent the greater contribution to climate change:

1. The methodology of impact assessment of planned legal regulation is used for the initiatives, laws and other resolution projects that are notified to the consideration to the Government of the Republic of Lithuania. The methodology foresees the principles, processes and participants of the impact assessment of planned legal regulation. An impact assessment includes the evaluation of the impact on the particular sector, public finances, administrative burden, economics, social environment, public administration, environment, regional development, legal system and etc. The process of impact assessment includes the planning, execution, generalization of the results, presentation and noticing.

2. In addition, impact assessment of National progress and development programs, and program assessment of strategic activity plans are executed in accordance to Methodology of program assessment. The participants of the program assessment process follow the principles of expedience, integrity, timeliness, regularity, impartiality and publicity.

3. In Lithuania, actions that may potentially have an impact on environment shall perform a particular procedure – the Impact assessment on environment that is regulated by the Law on the Impact Assessment on Environment, thus all Governments' and private proposals are accompanied by the procedures of evaluation of planned environmental change caused by designed measure. The Law provides the information on who and when prepares an Impact assessment on environment, describes the process and participants. The main goals of the Impact assessment on environment are:

- to set, describe and to evaluate a potential direct or indirect impact of planned activity on public health, flora and fauna, soil, ground surface and deep ground, air, water, climate, landscape and biodiversity, social environmental surroundings and etc.;
- to reduce or avoid an impact on the mentioned components, to evaluate if the planned activity is permissible in the certain area.

4. Greenhouse gas emission projections

Lithuania's package of existing policy measures including the target for renewable energy and energy efficiency measures are consistent with Lithuania's commitments.

Development of activity data projections was performed in accordance with the information from the different ministries, responsible for the particular sectors. Projections are made depending on policies and measures, which are defined in policy documents. Additionally, the impact of the separate measures to GHG reduction was calculated.

The last GHG emission projections were estimated in 2014 and covers policies and measures adopted and implemented until 2015.

4.1. Summary information on greenhouse gas emission projections

For the purpose of projecting GHG emissions up to 2030 the base year of 2012 was chosen (NIR submission 2014 data). However, the GHG data from 2014 submission contained emissions calculated using 1996 IPCC guidelines, therefore the baseline data for 2012 was adjusted according to 2006 IPCC methodology.

GHG emission projections in case of WEM scenario suggests that in 2030 total emitted GHG will be equal to 24,383.14 kt CO_2 eqv. (excluding LULUCF). These emissions are considered to be emitted with the implementation of the already existing direct or indirect GHG emissions mitigation measures. However, the increase of GHG emissions compared to 2012 is a result of projected increase in final energy consumption in energy and industry sectors. Total historic and projected GHG emissions in Lithuania are presented in Figure 4-1.

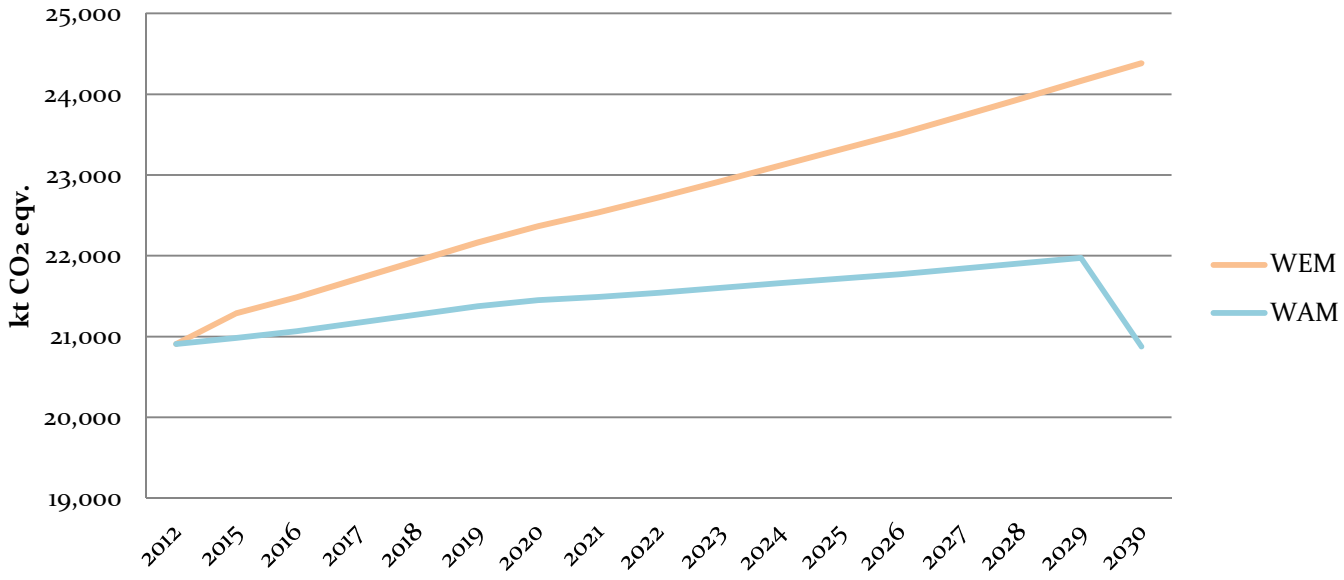


Figure 4-1. Aggregated projected GHG emissions by 2030

According to projected GHG emissions in case of WAM scenario additional implemented measures will result in total 3,507.9 kt CO_2 eqv. (excluding LULUCF) decrease compared to WEM scenario in 2030. Sudden decrease of GHG emissions in 2030 is influence by the start of operation of Visaginas nuclear power plant[6]. Currently electricity in Lithuania is imported (*over 65%*) or generated in power plants mostly by combusting natural gas.

4.2. Methodology for greenhouse gas emission projections

In order to strengthen GHG projection process and especially cooperation among different ministries, in the Strategy for the National Climate Change Management Policy until 2050 approved in 2012 and in the Interinstitutional Action Plan on the Implementation of the Goals and Objectives for 2013-2020 of the Strategy for the National Climate Change Management Policy approved in 2013, particular objectives and measures were set and resources foreseen:

1. Objective – ensure the monitoring and reporting of GHG emissions.

Measure – create a national information system that comprises GHG inventory, GHG projections, implementation of strategic documents, database on financing of climate change measures, report generation and informational system that is in line with the provisions for the EU GHG inventory reporting under the Regulation (EU) No 525/2013 of the European Parliament and of the Council of 21 May 2013 on a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change and repealing Decision No 280/2004/EC, (OJ L 165, 18.6.2013, p. 13).

2. Objective – ensure consistent projection of GHG emissions.

Measure – to compile databases that are necessary for projections of GHG emissions and removals, considering the requirements of the Regulation (EU) No 525/2013.

Measure – prepare projections of GHG emissions and removals.

GHG emission projections were developed according to data provided from the different ministries, companies, institutes, associations and Eurostat. As projections of activity data is made by the different ministries, for example, projections of transport fuel was prepared by the Ministry of Transport and Communications, Ministry of Energy provided projections for energy demand, Ministry of Agriculture provided projections on number of farms and animals. This way of projections is the most accurate, as ministries, responsible for particular sector, are making projections in order to prepare their plans and evaluate their sectors. However, fuel prices, the number of population, GDP rate and other national indicators the institutions use for their long term projections are not unified. Short term indicators are prepared by the Ministry of Finance and announced on their web-page.

Activity data was divided into subsectors as close to the same activity data which was used for historical emission calculations in the NIR and CRF, as possible. Then using the same emission factors as in the NIR, emission projections were calculated. Activity data, calculations and assumptions for emission projections with existing measures are presented further.

No specific models have been used for the projections of GHG emissions. The calculations were performed in Microsoft Office Excel and based on 2006 IPCC guidelines.

4.2.1. Main assumptions in Energy sector

Energy sector constitute of six main subsectors (Energy Industries, Manufacturing Industries, Transport, Other sectors, Fugitive emissions from fuels and other) from which GHG emissions are projected.

[6]Final decisions for the construction of nuclear power plant in Lithuania are not taken yet.

The scenario “with existing measures” include the national legislation documents that include projections of energy demand, climate change mitigation measures, projects currently in development and which will be set in motion during the period 2012–2030.

Firstly, projections were carried out by determining the consumption of fuel in every subsector up to the year 2030. Since the GHG emissions are directly linked to the final fuel consumption the calculation of GHG emissions could be performed by linearly interpolating them according to changes of the final fuel consumption.

The final energy consumption trends up to the year 2030 were calculated according to the Lithuanian energy sector development outlook analysis in relation to the EU’s strategic energy initiatives performed by Lithuanian energy institute in 2014. Calculation of the scenario with existing measures was based on the main scenario (most likely) from this analysis. In this scenario it is assumed that main energy efficiency initiatives will be implemented, as well as the target of the use of renewable energy sources will be reached, use of co-generation of heat and electricity will increase and other measures which would have an impact on different components of final energy consumption will be implemented.

Same tendencies were applied for construction sector. Energy consumption in residential sector would increase by 0.4 % yearly up to 2030. In Commercial/Institutional sector the increase would result in a yearly increase by 1 % up to 2030. Agricultural, forestry and fisheries sectors final energy consumption would remain the same as in 2012. The GDP growth is estimated to be 3.7 %.

Following it is listed the main assumptions were used for projections of GHG emissions with existing measures in Energy sector (*the GHG emissions were projected in 2014*):

- The Special Program for Climate Change for 2013 provided funding for the biofuel boilers up to 500 kW renovations in commercial/institutional sector. The project was expected to be finalized by the end of 2014 and decrease the GHG emissions by 82,881 t CO_2 until 2020 (13,813.5 t/year).
- The Special Program for Climate Change for 2013 also provided funding for school renovation projects in sector that was expected to be finalized by the end of 2014. By implementing this project it was expected to reduce the GHG emissions by 20,913.66 t CO_2 until 2020 (3,485.61 t CO_2/year).
- The Special Program for Climate Change for 2013 also provided funding for biofuel boilers from 500 kW to 5 MW installations for district heating in municipalities with a total population of no more than 100,000 people. The project was expected to be finalized by the end of 2014 and to decrease the GHG emissions by 45,739.56 t CO_2 (7,623.26 t CO_2/year) until 2020.
- The national 2015–2021 district heat sector development programme oversees construction of two additional cogeneration plants in Vilnius and Kaunas that will produce heat and electricity by incinerating waste. It is assumed that existing and planned municipal solid waste incineration plants will determine that district heat produced from incinerating municipal waste in 2020 will amount for 7 % of total supplied district heat.
- The Strategy for National Climate Change Management Policy for 2013–2050 and the National Renewable Energy Resources Development Strategy determines the target to achieve that the part of RES in the final energy consumption balance would be no less than 23% by 2020.
- National Energy Independence Strategy determines the target to consume 1.5% less energy annually (to consume 17% less energy in 2020 compared to 2009 level).
- The assumption was made that energy subsector “1.B Fugitive emissions from fuels” would remain at the same level as in 2012.

Use of biomass trend is inversely proportional to the EU ETS GHG emissions in the public electricity and heat production sector. GHG emissions are proportional to the carbon price in the EU ETS market, therefore as the carbon price increase it is assumed that a significant amount of GHG emissions will be reduced due to installation shifting to the use of biomass boilers instead.

Following main assumptions were used for projection of emissions with additional measures:

- National Energy Independence Strategy refers to the construction of the Visaginas NPP as one of the main strategic initiatives for securing energy independence. According to current circumstances it is unlikely that the new NPP could enter into operation before 2025. At the current situation we have assumed that the NPP operation will not start earlier 2030.
- According to scenarios in data provided by the Ministry of Energy of the Republic of Lithuania it is estimated that use of renewable energy sources (RES) in 2030 would be equal to 31% and would increase from 1,102 ktne in 2012 to 1,860 ktne in 2030. This would decrease the use of natural gas by 732.2 ktne in energy sector and 25.8 ktne of gasoline and diesel oil in transport sector. It is assumed that by changing this amount of natural gas, gasoline and diesel oil by RES would influence a decrease in GHG emissions by 1.76 mln. t CO_2 eqv..
- It is estimated that the public electricity and heat production, manufacture of solid fuels and residential sectors will remain the main sources of GHG emissions in energy sector.
- It is estimated that the overall GHG emissions from energy sector (not taking into account the transport sector) will decrease by 60.87% compared to 1990. GHG emissions from Agriculture/Forestry/Fishing sectors were assumed to remain at the same level as in 2012.

Table 4-1. Summary of projected GHG emissions from energy sectors (WEM)

Sector	Units	2012	2015	2020	2025	2030
Public Electricity and Heat Production	kt CO_2 eqv.	2,967.68	3,167.88	3,532.03	3,938.02	4,390.69
Petroleum Refining	kt CO_2 eqv.	1,420.72	1,516.57	1,690.89	1,885.26	2,101.96
Manufacture of Solid Fuels and Other Energy Industries	kt CO_2 eqv.	18.93	20.21	22.53	25.12	28.02
Manufacturing industries	kt CO_2 eqv.	1,270.59	1,308.41	1,374.21	1,443.62	1,516.83
Commercial/Institutional	kt CO_2 eqv.	334.51	344.65	362.23	380.71	400.13
Residential	kt CO_2 eqv.	947.49	936.16	917.59	899.39	881.54
Agriculture/Forestry/Fishing	kt CO_2 eqv.	103.85	103.85	103.85	103.85	103.85

GHG emissions are estimated to reach a total of 9,423.02 kt CO_2 eqv. in 2030. Most of the GHG will originate from Public electricity (46.59%), Petroleum refining (22.31%) and Manufacturing industries (16.09%). Manufacture of Solid Fuels and Other Energy Industries and Agriculture/Forestry/Fishing sectors are still expected to remain the smallest GHG emissions of energy subsectors.

The biggest potential for reducing GHG emissions is expected to be the EU ETS sectors and mainly the public electricity and heat production sector. This sector is currently undergoing a trend of switching fossil fuel to use of biomass. It is assumed that this change is mainly caused by the increase of the EU ETS carbon price which according to the Commission recommended parameters will increase up to 57 EUR/tonne CO_2 in 2035.

4.2.2. Main assumptions in Transport sector

GHG emissions and fuel consumption in transport sector are distributed into the main 5 subsectors:

1. *Civil aviation.* This subsector includes jet and turboprop powered aircraft (turbine engine fleet) and piston engine aircraft.

2. *Road transportation*. This subsector includes transportation on roads by vehicles with combustion engines: passenger cars, light duty vehicles, heavy duty vehicles and buses, mopeds and motorcycles.

3. *Railways.* This subsector includes railway transport operated by diesel locomotives.

4. *Water-borne navigation*. This subsector includes merchant ships, passenger ships, container ships, cargo ships, technical ships, tourism ships and other inland vessels.

5. *Other.* This subsector includes transport of gases via pipelines, military activity and off-road transport.

The projections were carried out by firstly determining the consumption of each fuel type in every subsector (Civil aviation, Road transportation, Railways, Water-borne navigation, other transportation) up to the year 2030.

Road transport sector is the main source of GHG emissions and fuel consumption in transport sector.

Following main assumptions were used for projection of emissions with existing measures:

- The Ministry of Transport and Communications of Republic of Lithuania provided the required activity data for the estimation of GHG emission projections in the transport sector. As the anticipated fuel consumption data was provided in 5 year intervals, the data for specific year in these intervals was linearly interpolated according to the anticipated fuel consumption increase and the statistical data on fuel consumption in 2012. No other measures were applied for determination of fuel consumption in the civil aviation subsector therefore the GHG emissions were calculated by applying the specific fuel emission factors used in NIR 2014.
- Domestic civil aviation is essentially narrow (0.01%) in Lithuania. Aviation gasoline (avgas) is used for piston-type powered aircraft engines, while the jet fuel used in turbine engines for aircraft and diesel engines. Aviation gasoline as a fuel is more common in private aircraft, while the jet fuel used in aircraft, airlines, military aircraft and other large aircraft. The anticipated fuel consumption for aircrafts used for civil international flights is provided in table below. It was also taken into account that international aviation GHG trends will follow the same trend as projected in civil aviation subsector.

Table 4-2. Activity data for fuel consumption in civil aviation subsector

Fuel type	Units	2015	2020	2025	2030
Aviation gasoline	tons	25	25	25	25
Jet kerosene	tons	72,399	94,581	117,303	139,756

- Projection of GHG emissions in railways subsector was carried out by using data received from the Ministry of Transport and Communication (Table 4-3). No other measures were applied for determination of fuel consumption in railways subsector therefore the GHG emissions were calculated by applying the specific fuel emission factors used in NIR 2014.

Table 4-3. Activity data for fuel consumption in railways subsector

Fuel type	Units	2015	2020	2030
Diesel oil	TJ	2,344	3,314	2,676
Biodiesel	TJ	10	22	17

- GHG emission projections were carried out on the assumption that the GHG emissions from navigation sector should be reduced by 40 % by 2050 as laid down in the national Climate Change Management Policy Strategy endorsed in 6 November 2012 by the Resolution No. XI-2375.

- GHG emissions from Road transport calculation were based on the historic data on the increase of vehicle number in Lithuania according to the data of State Enterprise "Regitra". The trend in increase of vehicle registered in Lithuania was linearly interpolated according to the historic data from 2005 up to 2012 for separate types of vehicle types which include passenger cars, light and heavy duty vehicles and motorcycles and mopeds. Results of increase in vehicle numbers are presented in table below.

Table 4-4. Activity data for numbers of vehicles registered in Lithuania

Vehicle type	2015	2020	2025	2030
Passenger cars	1,954,846	1,996,040	2,037,235	2,078,429
Light duty vehicle	101,512	102,364	103,215	104,067
Heavy duty vehicle	85,278	85,910	86,543	87,176
Motorcycles	88,074	93,841	99,608	105,375

- The Strategy for National Climate Change Management Policy, the National Renewable Energy Resources Development Strategy and the National Energy Independence Strategy set the target to increase RES share by 10% of final fuel consumption in transport sector by 2020.
- From the Special Program for Climate Change were provided funding for acquisition of environmentally safe busses project. These busses entered into operation in road transport in 2014. The period of their operation is 25 years. It is estimated that introduction of these busses will reduce GHG emissions from road transport sector by 903.36 t CO_2/year. Total GHG emission reduction by 2030 will amount to 14,453.79 t CO_2 eqv.
- Assumption was made that off-road sector will follow the target set by the National Renewable Energy Resources Development Strategy, to increase RES share by 10% of the total fuel consumption in transport sector by 2020.
- The GHG emissions from natural gas transportation in pipelines sector were estimated according to the required natural gas amounts to meet Lithuania's needs in 2020. It is set out in National Energy Independence Strategy that the average requirement of natural gas in 2020 will be 1.6–2.7 billion cubic meters. Emissions were further extrapolated up to the year 2030.

Following main assumptions were used for projection of emissions with additional measures:

- According to scenarios in data provided by the Ministry of Energy of the Republic of Lithuania it is estimated that the use of renewable energy sources (RES) in 2030 would be equal to 31% and would increase from 1102 ktne in 2012 to 1860 ktne in 2030. This would decrease the use of gasoline and diesel oil by 25.8 ktne in transport sector.

4.2.3. Main assumptions in Industrial processes and product use sector

The GHG emissions projections were provided only for the main emitters in this sector: the clinker, lime, ammonia and nitric acid producing companies. Also projection were provided for consumption of NF_3 gases.

The projections of CO_2 emissions from cement and lime production (including lime produced in sugar industry) were performed by applying emission factor from the National GHG Inventory report of Lithuania submitted in 2014 and equals to 0.54 t CO_2/t for clinker (correction for CKD was incorporated) and 0.8 t CO_2/t for lime production (correction for LKD was incorporated). A significant share of GHG emissions in mineral industry sector belongs to the CO_2 emissions from cement production. In 2013 the cement production company has finished cement production modernization project, were wet cement production was transformed to dry cement production process. This transition will lead to reduction of CO_2 emissions (with fuel combustion) by quarter: were wet production process 1.2 t CO_2/t of clinker, dry production process 0.85 t CO_2/t of clinker.

Following main assumptions were used for projection of emissions with existing measures:

- The projections of CO_2 emissions from clinker and lime production were based on the projections of activity data provided by company's authorities (Table 4-5). It is assumed that clinker production will increase in the period 2015–2020. From 2020 clinker production volume will remain stable. The lime production volume will remain stable in the period 2015–2030. The projections of N_2O and CO_2, which are emitted during the nitric acid and ammonia production process were based on data provided by the main manufacturer in Lithuania. The projection of consumption of NF_3 gases was based on activity data provided by company's authorities and it was assumed that consumption of NF_3 gases will increase until 2020, and after 2020 remain stable. Emissions of the other fluorinated gases are projected to be equal to 2012 level during the period 2015–2030.

Table 4-5. Summary of the activity data for Industrial processes and product use sector GHG projection

No	Planned production	2015	2020	2025	2030
1.	Clinker production, kt	1,000	1,500	1,500	1,500
2.	Lime production, kt	80	80	80	80
3.	Ammonia production, kt	1,130	1,130	1,130	1,130
4.	Natural gas consumption, mln.m^3	1,190	1,160	1,160	1,160
5.	Nitric acid production, kt	1,400	1,400	1,400	1,400
6.	Consumption of NF_3, kg	3,896	15,585	15,585	15,585

- The main GHG emission source in industrial processes and product use sector will remain nitric acid and ammonia production (Table 4-6). As data from manufacturing companies revealed the GHG emissions trends will remain stable in a period of 2015–2030 due to constant production capacity.

Table 4-6. Summary of the GHG projection emissions for Industrial processes and product use sector, $ktCO_2eqv$

No	Industrial processes and product use subsector	Base year	With existing measures			
		2012	2015	2020	2025	2030
1.	2.A Mineral Production	455.78	624.27	893.02	893.02	893.02
2.	2.B Chemical Industry	2,364.38	2,325.06	2,269.37	2,269.37	2,269.37
3.	2.C Metal Production	3.27	3.27	3.27	3.27	3.27
4.	2.D Non-energy products from fuels and solvent use	72.87	72.87	72.87	72.87	72.87
5.	2.E Electronics Industry	3.56	4.23	6.24	6.24	6.24
6.	2.F Product uses as substitutes for ozone depleting substances	284.11	284.11	284.11	284.11	284.11
7.	2.G Other product manufacture and use	2.94	2.94	2.94	2.94	2.94
8.	2.H Other Production	13.16	13.16	13.16	13.16	13.16
9.	**Total**	**3,200**	**3,329**	**3,544**	**3,544**	**3,544**

4.2.4. Main assumptions in Agriculture sector

Projections of GHG emissions from agriculture sector with existing measures (WEM) are based on forecasted livestock population, milk yield, harvested crops, consumption of synthetic N fertilizers, consumption of limestone and data on planned extension projects of biogas power plants. Forecast of the main data are provided by the Ministry of Agriculture, Agricultural Information and Rural Business Centre (AIRBC) and Institute of Animal Science.

Following main assumptions were used for projections of emissions with existing measures:

- The most important projection parameter in agriculture sector is livestock population. Considering CH_4 emissions cattle and swine category are responsible for 96% of emissions resulting from enteric fermentation and manure management. Therefore these two categories are considered as the most relevant. Nevertheless population of other livestock categories were also forecasted in order to derive more precise view of projected GHG emissions. These categories include – goats, horses, sheep,

poultry and rabbits; only fur-bearing domestic animals were kept constant in calculations as they represent a very small share in emissions (population of this category was assumed to be the same as in 2012). The projected data for livestock population was available for the years 2015, 2020 and 2030. The data on livestock population between the period 2012–2015, 2015–2020 and 2020–2030 were interpolated.

- The main activity data for calculation of CH_4 and N_2O emissions from manure management was livestock population, and data on manure management systems (MMS). Data on MMS for calculation of CH_4 and N_2O emissions from manure management in the most of categories were assumed to be the same as in 2012 except for swine. Taking into account planned extension projects of biogas power plants for the period 2012–2030 the fraction of annual nitrogen excretion (N_{ex}) that is managed in MMS was assumed to be treated in biogas power plants. The main data received was planned capacity of biogas plants during the period 2012–2030. For calculation of N_2O emissions from MMS the following projected parameters were used: livestock population and milk yield (kg/head/year). Projected value of milk yield (Table 4-7) is important as it is used for calculation of N excretion per head of dairy cow. The values of fraction of annual N_{ex} that is managed in MMS were used the same as for CH_4 emission calculation from manure management.
- The main activity data for calculations of projected N_2O emissions from agricultural soils category are the following: amount of synthetic N fertilizers applied to soil annually, amount of limestone consumed, harvested crops and area of crops harvested. The main activity data projections are presented in table below. For calculation of N_2O emissions from agricultural soils the projected data for the year 2015 and 2020 was provided by the Ministry of Agriculture based on calculations of the Lithuanian Institute of Agrarian Economics made in 2012.
- Consumption of lime or dolomite in agricultural soils is very difficult to forecast as this data being obtained from the companies that extracts and produces construction material such as break stone, road-material, chalk, and etc. Most of the soil liming materials used are by-products of extraction or production. Basically the consumption depends not only on the demand but also on the supply.

Table 4-7. Summary of activity data for agriculture sector GHG projection

Activity data	**Units**	**2012**	**2015**	**2020**	**2025**	**2030**
Cattle	1000 heads	729.17	730.00	785.00	805.00	825.00
Dairy cattle	1000 heads	331.04	300.00	315.00	322.50	330.00
Non-dairy cattle	1000 heads	398.13	430.00	470.00	482.50	495.00
Swine	1000 heads	807.48	750.00	850.00	875.00	900.00
Goats	1000 heads	13.59	10.00	9.50	9.80	10.00
Sheep	1000 heads	82.75	125.00	145.00	152.50	160.00
Horses	1000 heads	29.46	16.00	17.00	17.50	18.00
Rabbits	1000 heads	99.45	100.00	110.00	112.50	115.00
Poultry	1000 heads	9,085.60	8,950.00	9,500.00	9,700.00	9,900.00
Milk yield	kg/head/year	5,227.0	5,252.0	5,516.0	5,683.5	5,856.0
Harvested crops						
Wheat	1000 tons	2,998.9	2,560.0	2,738.0	2,849.3	2,965.1
Barley	1000 tons	741.9	805.0	880.0	929.5	981.7
Rye	1000 tons	156.6	130.0	136.0	140.1	144.4
Rape	1000 tons	632.9	526.0	528.0	529.3	530.6
Potatoes	1000 tons	549.9	585.0	609.0	624.4	640.1
Area harvested						
Wheat	1000 ha	637.5	640.0	658.0	667.9	678.0
Barley	1000 ha	217.3	266.0	273.0	277.1	281.3
Rye	1000 ha	55.9	55.0	57.0	58.1	59.3
Rape	1000 ha	263.5	262.0	273.0	279.3	287.0
Potatoes	1000 ha	32.2	26.0	36.0	44.2	54.3

Activity data	Units	2012	2015	2020	2025	2030
Synthetic N fertilizers	kt. N	150.0	148.0	151.0	154.0	157.2
Limestone*	tones	21,460	15,000	15,000	15,000	15,000

*when performing calculations of projected CO_2 emissions from soil liming additionally constant amount of dolomite applied was used (same as for 2012)

For calculation of projected CH_4 emissions from enteric fermentation of livestock emission factor (EF) (kg/head/year) of 2012 was used (applicable for country specific EF). Emissions calculated for each animal category are presented in table below.

Calculation of projected N_2O emissions from manure management systems included both direct and indirect emissions (Table 4-8).

To calculate N_2O emissions from crop residues the main activity data was projected; values of the main crops that represent majority of all crops harvested in Lithuania (Table 4-7) and harvested area of these crops. The activity data for other crops remained constant as in 2012.

Indirect soil emissions are closely related to activity data and calculations performed in category direct soil emissions.

Table 4-8. Summary of the GHG projection emissions for Agriculture sector

Activity data	Units	2012	2015	2020	2025	2030
Dairy cattle	kt	39.330	35.643	37.425	38.316	39.207
Non-dairy cattle	kt	20.928	22.603	24.705	25.362	26.019
Swine	kt	0.828	0.769	0.872	0.898	0.923
Sheep	kt	0.973	1.469	1.704	1.793	1.881
Goats	kt	0.068	0.050	0.048	0.049	0.050
Horses	kt	0.530	0.288	0.306	0.315	0.324
Rabbits and fur-bearing animals*	kt	0.089	0.090	0.096	0.097	0.099
Synthetic N fertilizers	kt	2.357	2.326	2.373	2.421	2.470
Organic N fertilizers	kt	0.533	0.493	0.493	0.494	0.490
Urine and dung from grazing	kt	0.599	0.587	0.620	0.632	0.644
Crops residues	kt	1.179	1.131	1.143	1.151	1.160
Mineralized N from C loss	kt	0.001	0.001	0.001	0.001	0.001
Drained organic soils	kt	2.118	2.118	2.118	2.118	2.118
Liming**	kt	10.93	8.08	8.08	8.08	8.08
Urea application	kt	15.72	15.36	15.67	15.98	16.31
Atmospheric deposition	kt	0.405	0.394	0.403	0.409	0.414
Nitrogen leaching and run-off	kt	0.978	0.960	0.977	0.991	1.005
Type of MMS (direct)						
Liquid system	kt	0.080	0.077	0.081	0.082	0.084
Solid storage & dry lot	kt	0.183	0.178	0.187	0.189	0.191
Other systems***	kt	0.024	0.045	0.116	0.132	0.160
Type of MMS (indirect)						
Liquid system	kt	0.127	0.111	0.092	0.088	0.079
Solid storage & dry lot	kt	0.121	0.118	0.125	0.126	0.127
Other systems	kt	0.032	0.041	0.069	0.078	0.089

*Only projected population of rabbits was available, population of fur-bearing animals was left constant (population of 2012)

**This amount also includes dolomite consumed for soil liming though this amount was assumed to be constant (same as in 2012) as no projected data was available

***Other systems include – deep bedding, with/without litter, etc.

Table below presents aggregated GHG emissions from agriculture sector. The largest source of GHG emissions is agricultural soils, particularly direct soils emissions. Comparing the share of GHG emissions it will not change a lot during projected period and agriculture soils subsector will remain the largest source of emissions. In total GHG emissions from agriculture sector will decrease by 2.8% from 2012 to 2015 but will start increasing afterwards – by 3% from 2015 to 2020, by 1.5% in 2025, and by 1.3% in 2030.

Table 4-9. Projected total GHG emissions from agriculture sector

Subsector	Units	2012	2015	2020	2025	2030
Total	kt CO_2 eqv.	4,482.10	4,357.15	4,495.13	4,564.03	4,626.56

4.2.5. Main assumptions in LULUCF sector

The projections are made merging emissions and removals of the three key categories (KC): Forest land, Cropland and Grassland. The best available data has been used for consideration.

Three scenarios were elaborated: without measures (WM), with existing measures (WEM) and with additional measures (WAM). Future emissions and removals projections have been compiled using data from NIR 1990–2012 and taking into account measures determined in the national strategies and plans.

Following main assumptions were used for projections of emissions with existing measures:

- For Forest land, which includes ARD areas, it was assumed that area will remain in the level of 1990-2000, where it fluctuates between 31.6 – 32.2% of the total land area. Reasons for marginal forest expansion would be returning of abandoned land to agriculture instead of using it for afforestation.
- Felling rates are assumed to be approximately 6 million. m^3 (removals).
- Croplands are assumed to be decreasing, because with no addition incentives from state would increase farmers' inertia to go for crop production. Abandoned grasslands would prevail. Nearly 6,400 kt CO_2 eqv. would be removed by these KC annually under certain conditions.
- Considering the overall increase in forest land and stable trend of croplands and grasslands area it is expected that removals from LULUCF sector will remain slightly increasing until 2030.

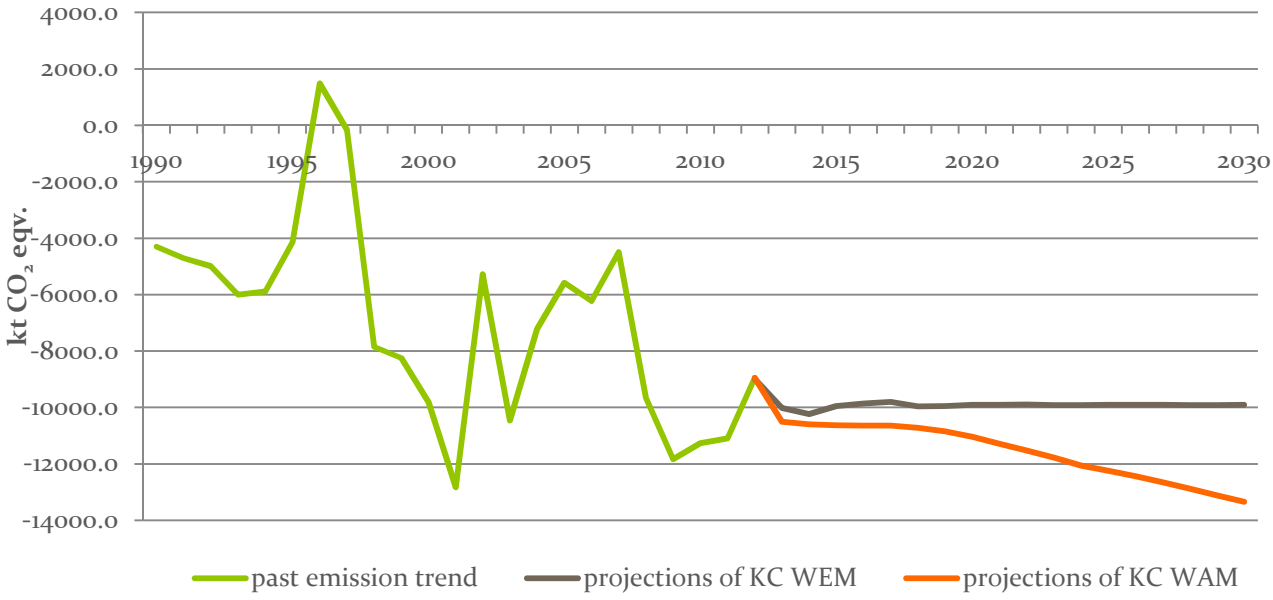


Figure 4-2. Current (green) and forecasted (2013–2020 orange and 2020–2030 grey) GHG emissions and removals from LULUCF sector

According to WEM scenario forest land area should reach 34.2% of the total forest land area. Felling rates will remain constant and similar as in current situation – 7.5 m m^3 (removals). The full potential of harvesting is not exploited in Lithuania. There could be approximately 9.5 m m^3 harvested each year. Current croplands and grasslands trend shows that with support from Rural Development Program interest (RDP) in agriculture and livestock farming are equally important, what means that Croplands and Grasslands will remain constant. It is expected that more than 9,800 kt CO_2 eqv. to be removed annually in 2012–2020 under WEM scenario.

Following main assumptions were used for projections of emissions with additional measures:

- The most controversial scenario is with additional measures which should include policies and measures adopted and implemented to mitigate climate change as well as policies and measures which are planned for that purpose.
- No drastic changes in forest land should be expected even if adding additional measures to current conditions. Forest land area could be expected to increase by 0.2–0.3% based on current situation. Increase in forest land area mostly depends on support from national programs for afforestation of abandoned lands and RDP. There are still a lot of discussions regarding the accounting of short rotation forest plantations as forest land, which would increase forest land area.
- Felling rates are estimated similar to current conditions because it is unlikely these amounts will increase, as great potential of unexploited forest stands still exist.
- Cropland area is not expected to increase significantly in the near future. Advanced cropland management practices should result in decreased net emissions, however it will not become a net sink.
- Grasslands should start to decline or follow the same level as in 2012. Decrease is possible due to natural or artificial afforestation. It is expected that overall grassland management will act as a net sink over 2012–2020 period.

4.2.6. Main assumptions in Waste sector

GHG emissions from waste sector originate from the following sources: solid waste disposal including sewage sludge, biological treatment of solid waste, waste incineration, wastewater treatment and discharge (industrial and domestic/commercial wastewater) and human sewage. These sources results emissions of CH_4, N_2O and CO_2. Major source of CH_4 emissions are solid waste disposal and wastewater treatment and discharge, source of N_2O is human sewage and source of CO_2 is waste incineration.

Projections of GHG emissions from waste sector with existing measures are based on the National Plan of Waste Management (hereinafter – the Plan) for period 2014–2020, data provided by the Ministry of Environment, the Environmental Protection Agency and the Association of the Regional Waste Management Centres.

The main assumptions used for GHG emissions projections in municipal solid waste disposal on land category (*the GHG emissions were projected in 2014*):

- Projected amount of generated municipal solid waste for period 2015–2020 is provided in the Plan. Municipal solid waste generation during the period 2021–2030 was calculated following the increase during the period 2015–2020.
- Less than 35% of generated MSW will be disposed of in landfills till 2030.
- GHG emissions from sludge disposal are reported together with MSW disposal on land category in the Lithuanian National GHG inventory Report. In the Plan the disposal of sludge in landfills was foreseen to be suspended no later than at 1st of January 2015.
- Projected amount of CH_4 recovery from landfills for period 2015–2030 was provided by Association of the Regional Waste Management Centres.

Table 4-10. Summary of activity data for MSW GHG emissions projections

Activity data	Units	2012	2015	2020	2025	2030
MSW generation	kt	1,004	1,377	1,401	1,424	1,448
MSW generation per capita	kg/capita/year	336	475	524	587	658
MSW disposed of in landfills	kt	792	758	490	475	459

Activity data	Units	2012	2015	2020	2025	2030
MSW disposed of in landfills	%	79	55	35	33	32
Sewage sludge disposed of in landfills	kt	49	0	0	0	0
Amount of methane recovered from SWDS	kt	5.1	6.7	11.7	10.0	8.9

Emissions from MSW and sewage sludge were calculated using First Order Decay model provided in the 2006 IPCC Guidelines

The main assumptions used for GHG emissions projections in Biological treatment of solid waste category:

- Biological treatment of waste is a source of CH_4 and N_2O. According to the Plan Lithuania had 9 sewage sludge and 49 green waste composting facilities by 2012 and 4 more green waste composting sites planned to be installed by the end of 2014. After the installation of all planned green waste composting facilities, up to 150 kt of green waste is planned to be treated there. Emissions from composting were calculated using method provided in the 2006 IPCC Guidelines.

The main assumptions used for GHG emissions projections in Incineration of waste category:

- Emissions from waste incineration without energy recovery are reported in this sector. Clinical waste incineration facility with nominal capacity 2 kt per year and hazardous waste incineration facility with nominal capacity 8 kt of hazardous waste and 1.6 kt of clinical waste per year are foreseen to be launched in 2014. Emissions from incineration of waste were calculated using method provided in the 2006 IPCC Guidelines.

The main assumptions were used for GHG emissions projections in wastewater treatment and discharge category:

- The discharge of degradable organic matter (DOM) will increase slightly (about 2%) by 2020 and same growth trend will continue until 2030.
- The percentage of Lithuanian population connected to centralised sewer networks will increase to 95% by 2030.
- Protein consumption per capita was evaluated by the Centre for Health Education and Disease Prevention (77.4 g/capita/day in 1998, 78.1 g/capita/day in 2002, and 81.91 g/capita/day in 2007). Approximation of these data by least square method was used for evaluation of consumption during 2015 to 2030.

Table 4-11. Summary of activity data for wastewater treatment and discharge GHG emissions projections

Activity data	Units	2012	2015	2020	2025	2030
Discharge of DOM	kt BOD	75.8	76.4	77.3	77.9	78.4
Population connected to centralised sewer networks	%	64	74	81	88	95
Protein consumption	g/capita/day	84.1	85.6	88.2	90.7	93.3

EUROSTAT population projections for the period 2015–2030 were used.

Emissions from wastewater treatment and discharge were calculated using method provided in the 2006 IPCC Guidelines.

GHG emission projections

Solid waste disposal on land

National targets to reduce CH_4 emissions from solid waste disposal on land are set in the National Plan of Waste Management. GHG projections were estimated based on the assumption that targets such as reduction

of the quantity of landfilled waste, increase of biodegradable waste composting, increase of the recovered gas use for energy will be achieved. Implementation of these targets will lead to gradual reduction of CH_4 emissions and will reach 16 kt (incl. CH_4 recovery) by 2030.

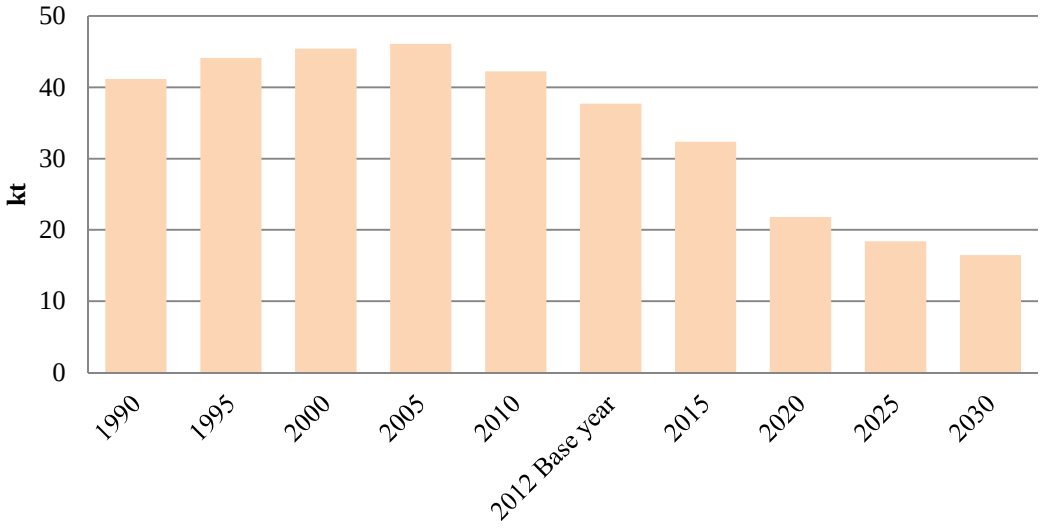


Figure 4-3. Historical and projected CH_4 emissions from MSW disposal on land (incl. CH_4 recovery)

The amount of CH_4 recovery from landfills will increase by 127% from 5.14 kt in 2012 to 11.67 kt in 2020 and will start to decrease by 24% from 2020 to 2030 (8.91 kt).

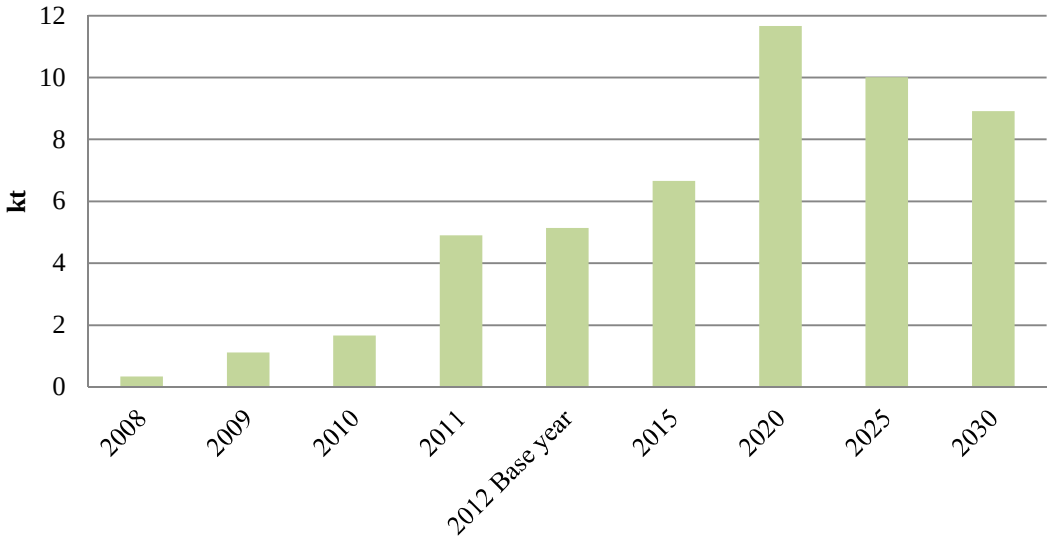


Figure 4-4. Historical and projected CH_4 recovery from landfills

Biological treatment of solid waste

The amount of biodegradable waste disposed in landfills has to be reduced and do not exceed 270 kt in 2020. To achieve these targets separate collection of biodegradable waste accumulated in the municipal waste flow and installation of new composting sites are foreseen. As a result of biodegradable waste composting increase, CH_4 and N_2O emissions will increase by 78%.

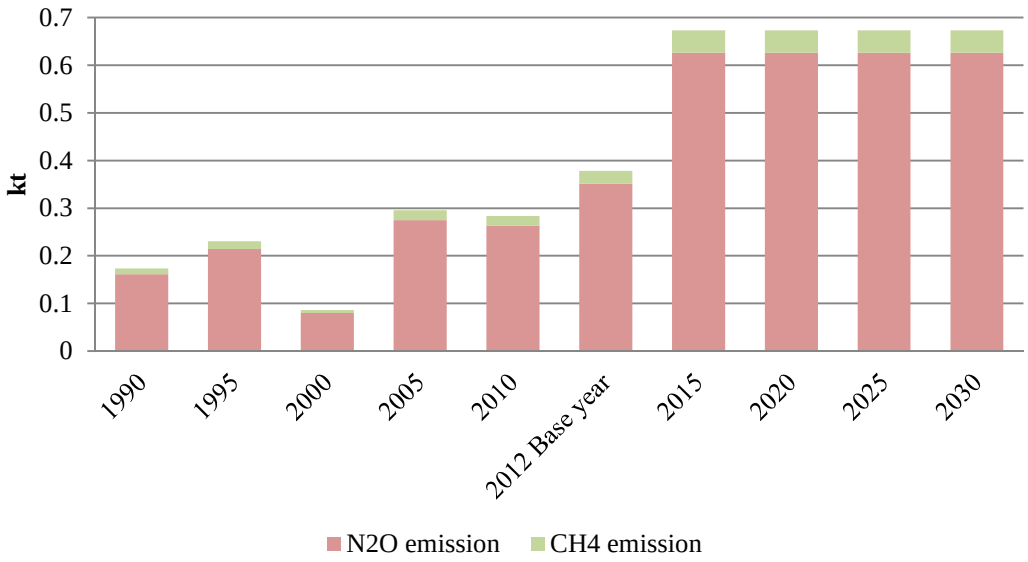


Figure 4-5. Historical and projected emissions from composting

Incineration of waste

Considerable increase of emissions from incineration of waste are projected as two incineration facilities are foreseen to be launched in 2014, however, it will contribute only 2.2 % to the total GHG emission from waste sector in 2030.

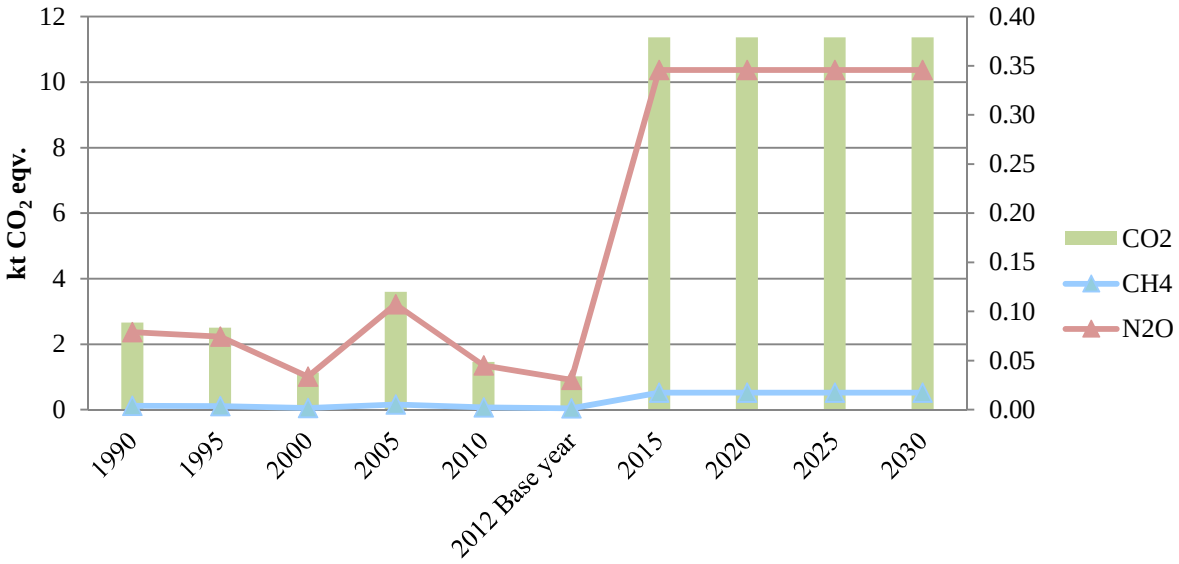


Figure 4-6. Historical and projected emissions from waste incineration

Wastewater treatment and discharge

There are close to 1800 wastewater discharge points in Lithuania. 99% of wastewater is treated in centralized aerobic wastewater treatment plants. The main source of CH_4 emissions are septic tanks. Emissions will decrease due to increase of population connected to centralized sewer networks and it is projected to be 1 kt of CH_4 by 2030.

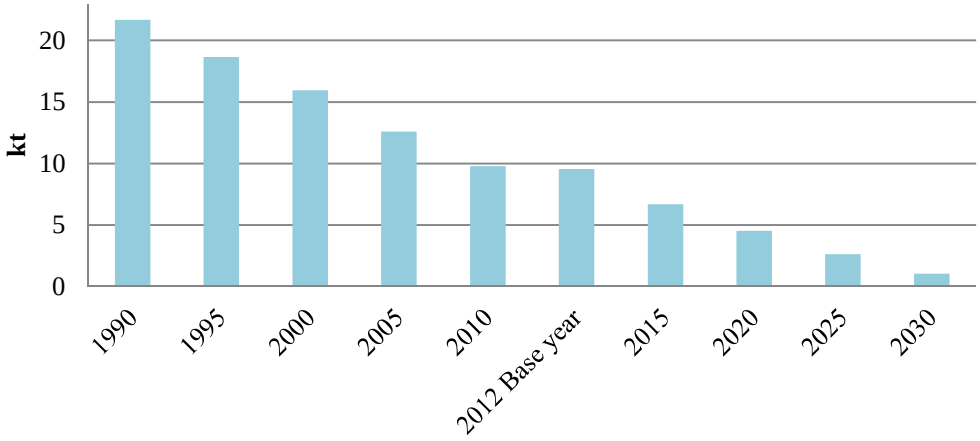


Figure 4-7. Historical and projected CH4 emissions from wastewater handling

No projections on protein consumption were made, therefore, N_2O emissions from human sewage were calculated using population projections and interpolated protein consumption. Emissions will drop due to decrease of the population and it is projected to be 0.16 kt of N_2O by 2035

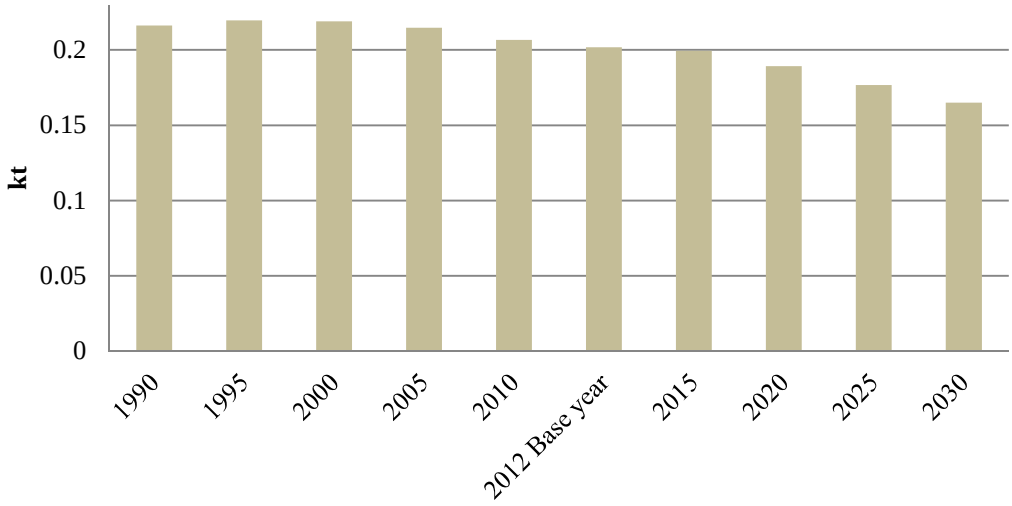


Figure 4-8. Historical and projected N_2O emissions from human sewage

4.2.7. Analysis of the greenhouse gas emission projections differences between the BR1 and BR2

For the 2nd Biennial Report the year 2012 (NIR submission 2014 data) was chosen as the base year for projecting GHG emissions up to 2030. However, the GHG data from 2014 submission contained emissions calculated using 1996 IPCC guidelines, therefore the baseline data for 2012 was adjusted according to 2006 IPCC methodology. Furthermore, the global warming potentials have changed consequently and this lead to difference in GHG emissions projections.

Other factor that resulted in difference of projections was the adoption of the new legislations:

1. Lithuanian Rural Development Program 2014–2020, approved by European Commission decision C(2015)842 on 13th of February 2015;

2 National livestock development programme for 2014–2020, adopted by the Government of the Republic of Lithuania Resolution No 1162 on 4th of December 2013;

3. National Plan of Waste Management for 2014–2020, adopted by the Government of the Republic of Lithuania Resolution No 366 on 16th of April 2014.

Additionally, the Lithuanian energy sector development outlook analysis in relation to the EU's strategic energy initiatives was performed by Lithuanian energy institute in 2014.

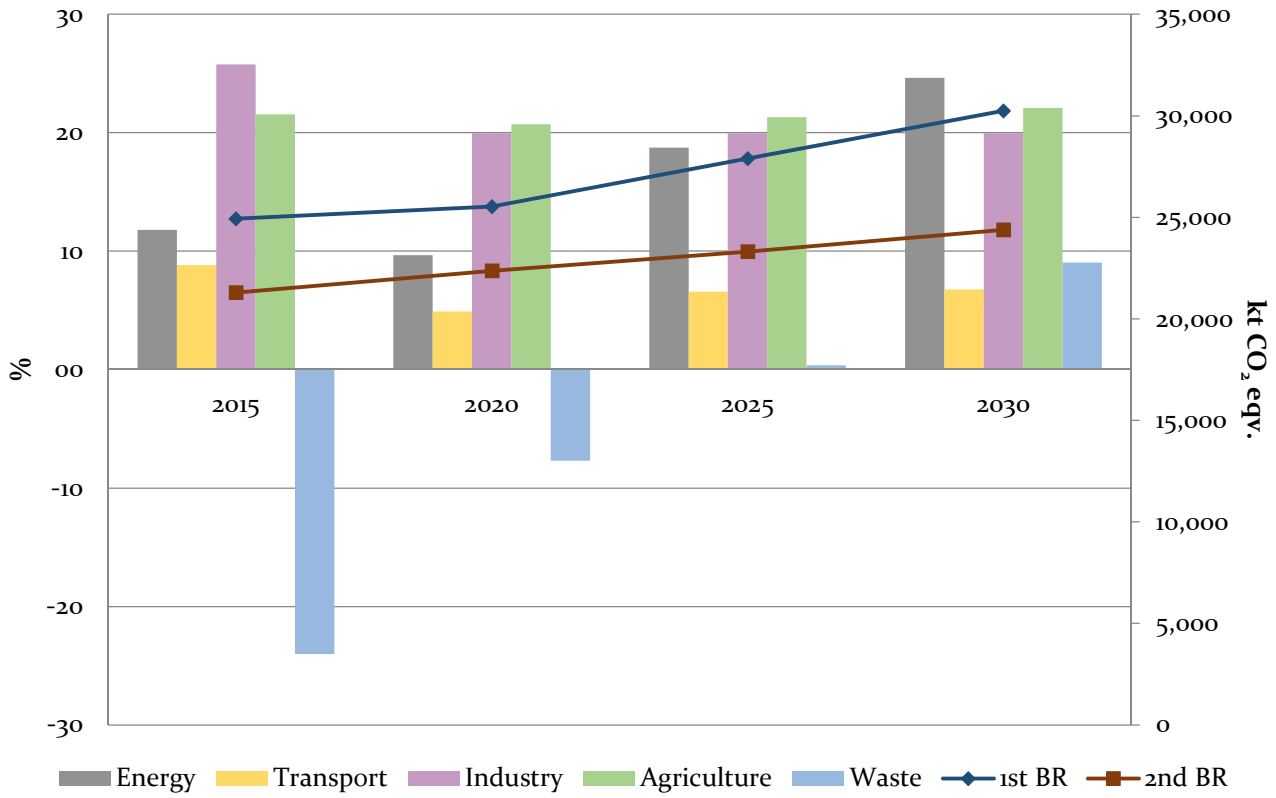


Figure 4-9. Comparison of GHG emissions projections (WEM)

Recalculation resulted that projected total GHG emissions for 2020 and 2030 with existing measures in the 6th National Communication and 1st Biennial Report were 25,532.6 kt CO_2 eqv. (2020), 30,247.7 kt CO_2 eqv. (2030) (excluding LULUCF) in the newest projection report total emissions for 2020 and 2030 with existing measures were 22,367.9 kt CO_2 eqv. (2020), 24,383.1 kt CO_2 eqv. (2030) (excluding LULUCF).

Projected total GHG emissions for 2020 and 2030 with additional measures in the 6th National Communication and 1st Biennial Report were 21,293.7 kt CO_2 eqv. (2020) and 22,527.1 (2030) (excluding LULUCF). In the newest projection report total emissions for 2020 and 2030 with additional measures were 21,451.5 kt CO_2 eqv. (2020) and 20,875.2 kt CO_2 eqv. (2030) (excluding LULUCF).

5. Provision of financial, technological and capability-building support to developing country Parties

Lithuania is not an Annex II Party of the UNFCCC therefore the provisions of Decision 2/CP 17, Annex I "UNFCCC biennial reporting guidelines for developed country Parties", section VI (A, B, C) are not applicable.

However, in October 2009 at the European Council Summit seeking for the international agreement on the GHG reduction targets after 2012, by the end of the first Kyoto commitment period 2008-2012, Lithuania on voluntary basis undertook a commitment to provide financial assistance to the developing countries together with the other 27 EU Member States.

On 23 April 2013 the Inter-institutional Action Plan on the Implementation of the Goals and Objectives for 2013-2020 of the Strategy for the National Climate Change Management Policy was adopted by the Government Resolution No 366 and annually amended in 2014 and 2015. In the inter-institutional Action Plan a measure for identification of potential finance sources in public and private sectors and contribution to financing and implementation of measures related to climate change mitigation and adaptation in developing countries is foreseen for the period of 2013–2018 by the Ministry of Environment in cooperation with the Ministry of Foreign Affairs.

Article 4 (1) of the UNFCCC states that all parties shall fulfil their obligations taking into account their common but differentiated responsibilities. By doing so, the countries should evaluate their specific national and regional development priorities, objectives and circumstances. Lithuania is among the countries listed in Annex 1 with the specific added condition that the country is undergoing the process of transition to market economy.

Article 4 (3) of the UNFCCC (to provide new and additional financial resources to meet the agreed full costs incurred by developing country Parties in complying with their obligations under Article 12, paragraph 1), article 4 (4) (to assist the developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects) and article 4 (5) (to take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to other Parties) are applicable to developed countries and countries listed in Annex II of the UNFCCC. Lithuania is not referred to as a developed country listed in Annex II of the UNFCCC.

The countries listed in Annex 1 of the UNFCCC supply information on the Government programs of collaboration in clean technology development, transfer of know-how and experience related to the climate change adaptation and mitigation activities.

In accordance with Article 10 of Law on Financial Instruments for Climate Change Management, a Special Programme for Climate Change is established for disbursement of funding for climate change management measures. The sources of financing of the Programme are the funds obtained from the transfer of assigned amount units, from the auctioning of allowances under the EU ETS, the funds donated by natural and legal persons for implementation of the measures aimed at mitigation of climate change and others. The funds of the Programme are used for 1) at least 40 % for energy consumption and production efficiency enhancement processes: modernisation of multistore dwelling houses and public buildings, implementation of other projects permitting most efficient reduction of GHG emissions in the energy, industry, construction, transportation, agriculture, waste management and other fields; 2) at least 40 % for promotion of the use of renewable energy

resources, introduction of environment-friendly technologies, including efficient energy production by cogeneration; 3) implementation of the Inter-institutional Action Plan on the implementation of the Goals and Objectives for 2013-2020 of the Strategy for the National Climate Change Management Policy; 4) reforestation and afforestation; 5) provision of information to and education of the public, scientific research and dissemination thereof, consulting and training of operators and other persons on topical issues of management and implementation of the climate change policy, enhancement of energy consumption efficiency, use of renewable energy resources and introduction of environment-friendly technologies; 6) implementation of measures on climate change mitigation and adaptation effects as stipulated under legal acts of the European Union, the UNFCCC and the Kyoto Protocol in the territory of the Republic of Lithuania and third countries; 7) implementation of other measures of efficient management of climate change policy which, by means of State aid, would allow operators and other economic entities whose activities are not included in the EU ETS to reduce the financial and economic burden of the commitments of GHG emissions reduction. Therefore, part of the revenues from this programme is dedicated to the implementation of mitigation and adaptation activities in the developing countries.

Pursuant to Article 16 of the European Parliament and the Council Regulation (EU) No 525/2013 on a mechanism for monitoring and reporting GHG emissions and for reporting other information at national and Union level relevant to climate change and repealing Decision No 280/2004/EC (OJ L 165, 18.6.2013, p.13), Lithuania has presented an information on financial support provided by Lithuania to developing countries in 2011-2012 which consisted of official information from the „Fast Start Finance" contributions, and submitted to the Secretariat of the UNFCCC, for the year 2011 and 2012. No contributions through bilateral or regional channels were provided in 2012.

Table 5-1 Contribution through multilateral channels (2011-2014)

Institution of programme	Contribution, USD			
	2011	2012	2013	2014
Multilateral institutions: 1. World Bank 2. European Bank for Reconstruction and Development 3. European Investment Bank	 33,173 37,461.6	 37,965.07	 111,682	 53,000
Total:	70,634.6	37,965.07	111, 682	53,000
Multilateral scientific, technological and training programmes: 1. Energy Sector Management Assistance Programme (ESMAP) financed through World Bank 2. The Eastern Europe Energy Efficiency and Environmental Partnership fund, financed through EBRD 3. Eastern Partnership Technical Assistance Trust Fund (EPTATF)	 33,173 37,461.6	 37,965.07	 111,682	 53,000
Total:	70,634.6	37,965.07	111,682	53,000

Table 5-2 Contribution (USD) through bilateral, regional and other channels for the year 2011

2011	Mitigation		Adaptation		
Recipient country/region	Energy	Other (public awareness)	Capacity-building	Coastal zone management	Other vulnerability assessments
Moldova	-	-	11,238.48	-	-
Georgia	26,223.12	7,492.32	-	-	-
2013					
Recipient country/region	Energy	Other (public awareness)	Capacity-building	Coastal zone management	Other vulnerability assessments
Ukraine*		9,752			
Total:		9,752			
2014					
Recipient country/region	Energy	Other (public awareness)	Capacity-building	Coastal zone management	Other vulnerability assessments
Malaysia	153 499				
Armenia, Ukraine, Moldova		7,236			
Total:		7,236			

Table 5-3 Fast start finance 2010–2012: projects/funds financed by Lithuania

Beneficiary	Area	Project/fund	Implem. period	Impact/results
Moldova	Adaptation	Certification of organic agriculture (livestock farming)	2011	Strengthening of the administrative capacity and competence
Georgia	Mitigation	Promoting alternative energy sources for heating in rural areas of Ajara	2011	Thanks to the successful implementation of the project by a local NGO, Government of Ajara was persuaded of the benefits of alternative energy sources to the region and intends to provide financing to similar projects
Georgia	Mitigation	„Green capital“	2011	Drawing attention of young people to their everyday consumption habits and how it influences GHG emissions
Ukraine	Mitigation	E5P - Eastern European Energy Efficiency and Environment Partnership - fund	2011	Financing of projects in the strategic sectors of water supply, renovation of water cleaning and heating systems
Global	Adaptation	ESMAP - Energy Sector Management Assistance Program - fund	2010-2012	Assistance to low- and middle-income countries to promote environmentally sustainable energy solutions for poverty reduction and economic growth

All of the funding for 2011 and 2012 was new and additional, because Official Development Assistance (ODA) was specified to be climate related and other official flows (OOF) were provided through designated Climate Change Special Programme fund, all committed as assistance to developing countries under the UNFCCC after the pledges and commitments were announced at COP15 in Copenhagen. Private sector directly participates in the development of clean technologies. A special tariff system for renewable energy generation could be identified as indirect support for the development of clean technologies in Lithuania. Business responds to the demand of clean technology in the market. The constant need to maintain competitiveness requires a steady improvement. It is directly related to the attraction of the country's intellectual potential to this area, know-how and specific skills generation. In the private sector technology development and capacity strengthening take place under the market conditions with indirect support possibilities: the EU emission trading scheme and available EU support. In case of EU support, local authorities contribute to the development of technologies with the partial funding.

Update on Climate finance (2013–2014)

During the 2013-2014 reporting period, Lithuania has given climate related support through multilateral and bilateral channels. All of the funding for 2013 and 2014 was new and additional.

On 21st of October, 2013, Lithuania has pledged to contribute a total of 100,000 EUR to the Eastern European Energy Efficiency and Environment Fund, which is administered by European Bank for Reconstruction and Development (EBRD). The aim of the Fund is to finance climate change mitigation, mainly in energy efficiency areas, projects in such countries as Moldova, Georgia and other strategic Eastern European partners. Around 4,000 EUR were made as a voluntary contribution (offset) to the Climate Change Special Programme, which were added to a pledge. The Contribution Agreement with EBRD was signed on 26th of September, 2014. According to this Agreement funds (105,360 EUR or 111,682 USD) equally shall be disbursed to climate change mitigation (energy efficiency sector) projects in Armenia, Georgia and Moldova.

Bilaterally, through the Ministry of Foreign Affairs' Official Development Assistance (ODA) Programme, 31,900 LTL (9,200 EUR) was granted to the implementation of project titled "Sustainable energy planning-international cooperation and best practices of Mayor's Pact" in Ukraine (more information in tables 2 and 4).

In 2013, a total amount of 395,553 LTL (114,560 EUR) of climate finance was committed to the developing countries.

In 2014, through multilateral channels, Lithuania has provided 50,000 EUR to the EIB's Eastern Partnership TA Trust Fund, which directs a large part of its funds towards the Climate Action (for example in 2013, 73 per cent of the fund were directed for climate-related purposes).

From 2014 the Ministry of Environment supports bilateral official development assistance (ODA) projects in the field of climate change according to the new legislation regulating activities in the (ODA) field – the *Law on Development Cooperation and Humanitarian Assistance* (approved by the Parliament in 2013, May) and *Directions for the Politics of Development Cooperation in 2014-2016* (approved by the Government in 2014, January). The environmentally-sound development, environmental protection and combat climate change are among the priority areas of the Lithuanian development cooperation policy.

Eligible for this support are a variety of Lithuanian entities which intend to pursue climate change mitigation and adaptation projects in developing countries. More detailed requirements for projects and all procedural issues are laid down in the *Manual on the implementation of development cooperation activities by state and municipal institutions and agencies*, approved by Decision No. 278 of the Lithuanian Government (dated 26 March 2014).

After the approval of the *Commission on development cooperation and humanitarian aid* and its rules of procedure, in the end of 2014 the Ministry of Environment announced a call for project concepts/applications for applicants who are willing to implement projects in developing countries by transferring renewable energy technologies and their experience in the field of renewable energy sources and contributing with additional finance. The most suitable candidate (Lithuanian based producer of solar cells) out of 11 candidates were awarded with 144,810 EUR subsidy to implement project in Malaysia. (Project title „*Promotion of the usage of newest renewable energy technologies and transfer of available knowledge in this field to Malaysian institutions", preliminary value 223 thousands EUR, the termination/disbursement date – 2016).*

Table 5-4 Contribution through bilateral, regional and other channels for the year 2013-2014

Recipient country/ region/project/programme	Total amount		Status: provided, committed, pledged (preferably: committed)	Funding source: ODA, OOF, other	Financial instrument: grant, concessional loan, non-concessional loan, equity, other	Type of support: Mitigation, adaptation, crosscutting, other[a]	Sector[b]	Additional information[c]
	Climate-specific							
	European euro - EUR	national currency						
"Sustainable energy planning- international cooperation and best practices of Mayor's Pact" in Ukraine (2013)	31,900	9,200	Committed	ODA	grant	Mitigation	Energy	The project also qualified as capacity building
Bilateral development cooperation project: "Promotion of the usage of newest renewable energy technologies and transfer of available knowledge in this field to Malaysian institutions"	144,810	500,000	committed	ODA	grant	mitigation	energy	Installation of two test solar energy facilities (2 x 30 kW) in a university and a port in Perak state, Malaysia. Project to be implemented in 2015-2016 by a Lithuanian manufacturer selected by the Ministry of Environment.
Regional development cooperation project: seminars "Main elements of nuclear safety" to higher-level officials of Armenia, Ukraine and Moldova	6,826	23,569	provided	ODA	grant	mitigation	energy	Implementing institution – Department of Development Cooperation of the Ministry of Foreign Affairs (www.orangeprojects.lt)
Total contributions through bilateral, regional and other channels (2013-2014)	**183,536**	**532,769**						

In addition, in 2015 Lithuania contributed 50 000 EUR to the Eastern Partnership Technical Assistance Fund, administered by the EIB, which significantly supports the climate change mitigation and adaptation actions in the EU Eastern Partnership countries and pledged 100 000 EUR to the Green Climate Fund.

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Annex

CTF Table 2 Description of quantified economy-wide emission reduction target

Emission reduction target: base year and target			
Base year/ base period	1990		
Emission reductions target (% of base year/base period)	20.00	The target of 20% will be fulfilled jointly by the EU and LT. Legally binding target trajectories for the period 2013-2020 are enshrined in both the EU-ETS Directive (Directive 2003/87/EC and respective amendments) and the Effort Sharing Decision (Decision No 406/2009/EC). These legally binding trajectories not only result in a 20% GHG reduction in 2020 compared to 1990 but also define the EU's annual target pathway to reduce EU GHG emissions from 2013 to 2020. The Effort Sharing Decision sets annual national emission targets for all Member States for the period 2013-2020 for those sectors not covered by the EU emissions trading system (ETS), expressed as percentage changes from 2005 levels. In March 2013, the Commission formally adopted the national annual limits throughout the period for each Member State. By 2020, the national targets will collectively deliver a reduction of around 10% in total EU emissions from the sectors covered compared with 2005 levels.	
Period for reaching target	by 2020		
Gases and sectors covered. GWP values.			
Gases covered	**Covered**	**Base Year**	**GWP[c] reference source**
CO_2	Yes	1990	4nd AR
CH_4	Yes	1990	4nd AR
N_2O	Yes	1990	4nd AR
HFCs	Yes	1995	4nd AR
PFCs	Yes	1995	4nd AR
SF_6	Yes	1995	4nd AR
NF_3	NO	1995	4nd AR

Sectors covered	Covered
Energy	Yes
Transport	Yes
Industrial processes	Yes
Agriculture	Yes
LULUCF	No
Waste	Yes

Role of LULUCF sector		
LULUCF in base year level and target	Excluded	

CTF Table 3. Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects

Name of mitigation action [a]	Included in with measures GHG projection scenario	Sectors affected	GHGs affected	Objective and/or activity affected	Type of instrument	Status of implementation	Brief description	Start year of implementation	Implementing entity or entities	Mitigation impact	
										Estimate of mitigation impact (not cumulative) (kt CO_2 eq)	2020
Promotion the use of renewable energy sources (except transport sector)	Yes	Energy	CO_2	Increase in renewable energy use	Economic, Regulatory	Implemented	Lithuania has set its national target for increasing the share of RES in its total final energy consumption to 23 percent by 2020.	2007 (Initially the targets of RES had been set in National Energy Strategy, approved of by the Seimas (Parliament) of the Republic of Lithuania in 2007)	Ministries of Energy, Environment, Agriculture, and Economy.	kt CO_2 eq	747

Name of mitigation action [a]	Included in with measures GHG projection scenario	Sectors affected	GHGs affected	Objective and/or activity affected	Type of instrument	Status of implementation	Brief description	Start year of implementation	Implementing entity or entities	Mitigation impact	
										Estimate of mitigation impact (not cumulative) (kt CO_2 eq)	2020
Increasing the energy efficiency	Yes	Energy, Transport, Industry/industrial processes	CO_2	Efficiency improvement in the energy and transformation sector Efficiency improvements of buildings Efficiency improvement in industrial end-use sectors Efficiency improvements of vehicles	Voluntary Agreement, Regulatory, Economic, Information	Implemented	The National Energy Independence Strategy determines the target to consume 1.5 % less energy annually (to consume 17 % less energy in 2020 compared to 2009 level). This target also involves modernization of buildings. Implementation of Energy Efficiency Action plan provides for final energy savings to amount to 740 ktoe of final energy in 2020 and a general indicative national energy saving target of 9% by 2016 or 3 797 GWh (327 ktoe). In order to fully transpose provisions of Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency in to national law, in 2014 the draft Law on Energy Efficiency was prepared. In the draft law is determined that the system of energy efficiency commitment must to ensure that by 31 December 2020 saved energy in the final consumption will reach 287 ktoe. Energy Efficiency Obligation Scheme is being created for this purpose, also energy will be saved by renovating multi-apartment and public buildings. By the end of 2012, a total of 1 603 GWh (138 ktoe) was saved, i.e. during the period of five years (2008–2012), 42 % of the required amount was saved. About 27 % of all savings was achieved through the signed	2011 (The energy efficiency target had been set in National Energy Strategy, approved of by the Seimas (Parliament) of the Republic of Lithuania in 2007)	Ministries of Energy, Environment, Economy, Interior Affairs, Finance, and Transport and Communication. Local authorities (municipalities).	kt CO_2 eq	1496

Name of mitigation action [a]	Included in with measures GHG projection scenario	Sectors affected	GHGs affected	Objective and/or activity affected	Type of instrument	Status of implementation	Brief description	Start year of implementation	Implementing entity or entities	Mitigation impact	
										Estimate of mitigation impact (not cumulative) (kt CO_2 eq)	2020
							voluntarily agreements between the Ministry of Energy and energy companies.				
Promotion of renewable energy sources use in transport sector	Yes	Transport	CO_2	Low carbon fuels/electric cars	Regulatory, Information, Economic	Implemented	The Law of the Republic of Lithuania on Renewable Energy Resources was adopted on 12 May 2011 by the Parliament of the Republic of Lithuania (updated in 2014) to ensure the balanced development of the RES in Lithuania. This Law establishes the tasks for separate energy sectors; for transport sector the target is to increase the share of RES (biofuels and electricity) by 10 % in all modes of transport in comparison with the final consumption of the energy in the transport sector. The requirements for blending of biofuel into the mineral fuels are: in petrol fuel the content of biofuels has to be from 5 to 10 % and in diesel fuels not less than 7 %. The RES use in the transport sector is promoted through the reimbursement, by the National Paying Agency of the Ministry of Agriculture, of raw materials for biofuel production, an excise tax relief and an exemption from environmental pollution tax. The National Programme on the Development of Transport and Communications for 2014–2022 set the goal to promote the use of alternative fuels and technologies and set the target to reach that from sold new	2007 (The targets had been set in National Energy Strategy, approved of by the Seimas (Parliament) of the Republic of Lithuania in 2007)	Ministries of Energy, Transport and Communication, Environment, Interior and Agriculture.	kt CO_2 eq	423

Name of mitigation action [a]	Included in with measures GHG projection scenario	Sectors affected	GHGs affected	Objective and/or activity affected	Type of instrument	Status of implementation	Brief description	Start year of implementation	Implementing entity or entities	Mitigation impact	
										Estimate of mitigation impact (not cumulative) (kt CO_2 eq)	2020
							cars 6% will be electric vehicles in 2022.				
Implementation of Nitrates directive	Yes	Agriculture	CH_4, N_2O, CO_2	Other activities improving cropland management; Improved animal waste management systems; Activities improving grazing land or grassland management.	Economic, Regulatory	Implemented	Implementation of the Council Directive of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (91/676/EEC) with the latest amendment by the Regulation (EC) No 1137/2008 of the European Parliament and the Council of 22 October 2008 (further – Nitrates Directive) is primarily directed towards the minimization of the water pollution with nitrates. Activities are supported for the establishment of modern manure silos and other measures which enable the control against manure penetration into the surroundings. Sole replacement of manure handling systems from thick or dry silos to liquid silos may lead to a reduction in emission of nitrogen compounds to atmosphere by up to 20 times.	2004	Ministries of Agriculture, Energy and Economy.	kt CO_2 eq	100
Increasing the National forest area	Yes	Forestry/LULUCF	CO_2	Enhancing production in existing forests; Afforestation and reforestation.	Economic, Education, Regulatory, Research, Information	Implemented	The National Forest Area Development Program 2012-2020 approved by Resolution No 569 of the Government of the Republic of Lithuania of 23 May 2012 is sought to increase forest coverage of the country up to 34.2 % by 2020. To increase forest area by 3% until 2020.	2003 (The Program on the increased afforestation of Lithuania was adopted in 2003, and repealed since 2012).)	Ministries of Environment and Agriculture.	kt CO_2 eq	1680

Name of mitigation action [a]	Included in with measures GHG projection scenario	Sectors affected	GHGs affected	Objective and/or activity affected	Type of instrument	Status of implementation	Brief description	Start year of implementation	Implementing entity or entities	Mitigation impact	
										Estimate of mitigation impact (not cumulative) (kt CO_2 eq)	2020
Decreasing the amount of biodegradable waste in landfills	Yes	Waste management/waste	CH_4	Reduced landfilling.	Other (Planning)	Implemented	The National Strategic Waste Management Plan 2007- 2013 was repealed in April 2014 with the National Waste Management Plan for 2014-2020 by Resolution No 519 of the Government Republic of Lithuania. This planned to lower amount of landfilled biodegradable municipal waste ensuring that biodegradable municipal waste would make not more than 35 % until 2020, if compared with the year 2000 quantities of the biodegradable municipal waste. Regarding this PaM 49 of green waste composting sites were installed and it is planned to install 4 more in Lithuania. In 2012 in these 49 waste composting sites 40 000 tonnes of green waste was composted. The National Waste Management Plan for 2014-2020 sets the goal by the 2030 that approximately 100 000 t of green waste will be composted.	2007 (The National Strategy Plan of Waste Management adopted in 2007 and repealed in 2014)	Ministry of Environment and Regional Waste management Centres.	kt CO_2 eq	538
Promoting the extraction and use of biogas from landfills	Yes	Waste management/waste	CH_4	CH4 collection and use from lanfills	Other (Planning), Regulatory	Implemented	According to the data of the Regional waste management centres and the National Waste Management Plan for 2014-2020 it is planned to extract approximately 13 mln. m3 of biogas from all landfills. It was also planned to build 4 biological treatment plants with biogas production in Alytus, Panevėžys, Telšiai and Utena regions till the end of 2015.	2014 (The National Strategy Plan of Waste Management adopted in 2007 and repealed in 2014)	Ministry of Environment and Regional Waste managament centres.	kt CO_2 eq	1940

Name of mitigation action [a]	Included in with measures GHG projection scenario	Sectors affected	GHGs affected	Objective and/or activity affected	Type of instrument	Status of implementation	Brief description	Start year of implementation	Implementing entity or entities	Mitigation impact	
										Estimate of mitigation impact (not cumulative) (kt CO_2 eq)	2020
Production process change in cement company	Yes	Industry/industrial processes	CO_2	Installation of abatement technologies	Economic	Implemented	In 2013 the only cement manufacturing company SC "Akmenės Cementas" ended modernization of technology process, when wet cement production methods was changed in to dry. This modernization allows saving the fuel consumption by half for a production unit and by quarter reducing GHG emissions. To compare, to produce 1 t of clinker using the wet method 1.2 t of CO2 is emitted and 0.85 t CO2 is emitted by dry method. This allows SC “Akmenės Cementas” to reduce GHG levels by 500 GgCO2 eq/year.	2013 (2006 initiated)	Cement producing company	kt CO_2 eq	500
Technological improvement in chemical industry	Yes	Industry/industrial processes	N_2O	Installation of abatement technologies	Economic	Implemented	To reduce the pollution with N2O gas emissions in the nitrogen fertilizers producing company 2 JI projects of N2O emissions reduction in chemical industry were conducted. The estimated GHG reduction amounted to 7 643 017 tCO2eq. It was estimated that without the implementation of these projects in 2013 the ETS sector‘s verified emission could be 1.2 m t CO2eq higher (8.7 m instead current 7.5 m t CO2eq).	2009 (For the first JI project, fertilizer production company, received the final determination from UNFCCC Secretariat in 2009.)	Company producing fertilizers	kt CO_2 eq	538

CTF Table 5. Summary of key variables and assumptions used in the projections analysis

		Historical						*Projected*			
Key underlying assumptions	***Unit***	***1990***	***1995***	***2000***	***2005***	***2010***	***2012***	***2015***	***2020***	***2025***	***2030***
Population	thousands	3,697.84	3,629.10	3,499.54	3,322.53	3,097.28	2,987.77	2,901.04	2,671.11	2,425.26	2,201.95
GDP growth rate	%	-3.30	4.60	3.60	7.70	1.60	3.80	3.70	3.70	3.70	2.20
Municipal solid waste going to landfills	tonne	1,253.90	1,146.40	1,314.50	1,098.70	1,062.60	791.90	757.60	490.20	474.70	458.50
Share of CH4 recovery in total CH4 generation from landfills	%	0.00	0.00	0.00	0.00	3.70	12.00	17.10	34.90	35.20	35.10
Final energy consumption:-Industry	GJ	84,430,000.0	24,037,000.0	16,400,000.0	22,030,000.0	19,068,000.0	21,251,000.0	21,894,926.6	23,011,787.9	24,185,620.3	25,419,330.0
Final energy consumption:-Transport	GJ	82,691,000.0	43,157,000.0	43,942,000.0	59,964,000.0	66,554,000.0	68,172,000.0	71,285,986.2	76,795,252.6	82,730,297.2	89,124,025.8
Final energy consumption:-Residential	GJ	39,467,000.0	29,006,000.0	30,529,000.0	33,078,000.0	35,306,000.0	34,326,000.0	33,915,733.5	33,242,823.6	32,583,264.8	31,936,792.0
Final energy consumption:-Agriculture	GJ	20,721,000.0	6,219,000.0	2,945,000.0	3,194,000.0	3,617,000.0	3,682,000.0	3,682,000.0	3,682,000.0	3,682,000.0	3,682,000.0
Final energy consumption:-Services	GJ	42,301,000.0	15,310,000.0	5,684,000.0	5,866,000.0	6,347,000.0	6,048,000.0	6,231,260.5	6,549,117.4	6,883,188.2	7,234,299.9
Final energy consumption:-Other	GJ	0.00	0.00	0.00	82,000.00	78,000.00	82,000.00	82,000.00	82,000.00	82,000.00	82,000.00
Livestock:-Dairy cattle	1000 heads	842.00	586.05	438.35	416.50	359.78	331.04	300.00	315.00	322.50	330.00
Livestock:-Non-dairy cattle	1000 heads	1,479.50	479.10	309.94	383.79	388.20	398.14	430.00	470.00	482.50	495.00
Livestock:-Sheep	1000 heads	56.50	32.30	11.50	29.21	58.55	82.75	125.00	145.00	152.50	160.00
Livestock:-Swine	1000 heads	2,435.90	1,269.96	867.58	1,114.65	929.40	807.48	750.00	850.00	875.00	900.00
Livestock:-Poultry	1000 heads	168,150.00	84,442.00	55,765.00	93,971.00	94,663.00	90,856.00	8,950.00	9,500.00	9,700.00	9,900.00
Nitrogen input from application of synthetic fertilizers	kt nitrogen	212.00	40.00	98.00	119.00	143.20	150.00	148.00	151.00	154.05	157.16
Nitrogen input from application of manure (including sewage sludge and compost)	kt nitrogen	84.54	42.52	31.71	37.09	34.32	33.95	31.39	31.39	31.41	31.17

		Historical						*Projected*			
Key underlying assumptions	***Unit***	***1990***	***1995***	***2000***	***2005***	***2010***	***2012***	***2015***	***2020***	***2025***	***2030***
Nitrogen fixed by N-fixing crops	kt nitrogen	5.04	21.74	18.55	47.20	47.21	46.93	46.93	46.93	46.93	46.93
Nitrogen in crop residues returned to soils (including N-fixing crops)	kt nitrogen	28.16	38.55	38.58	64.80	64.80	75.06	71.97	72.77	73.27	73.79
Area of cultivated organic soils (same as in 2012)	ha (hectares)	154.21	174.49	192.37	208.32	180.37	175.71	175.71	175.71	175.71	175.71

CTF Table 6 Information on updated greenhouse gas projections

								GHG emission projection scenarios			
GHG emission and removals								***With existing measures***		***With additional measures***	
GHG emission projections	***Unit***	***1990***	***1995***	***2000***	***2005***	***2010***	***2013***	***2020***	***2030***	***2020***	***2030***
Sector											
Energy	kt CO_2 eqv.	25,318.39	10,064.65	7,394.63	8,451.68	8,215.76	6,804.63	8,321.25	9,740.94	7,631.85	6,784.69
Transport	kt CO_2 eqv.	7,704.48	3,976.37	3,460.75	4,436.02	4,593.55	4,584.12	5,250.81	5,942.25	5,023.80	5,390.55
Industry/industrial processes	kt CO_2 eqv.	4,518.17	2,257.59	3,104.89	4,139.81	2,246.22	2,938.11	3,544.99	3,544.99	3,544.99	3,544.99
Agriculture	kt CO_2 eqv.	8,622.28	4,404.02	4,006.46	4,592.18	4,473.41	4,429.44	4,495.13	4,626.56	4,495.13	4,626.56
Forestry/LULUCF	kt CO_2 eqv.	-3,876.39	-2,910.22	-9,145.41	-5,155.03	-11,208.30	-9,963.98	-9,904.75	-9,911.27	-11,044.45	-13,340.55
Waste management/waste	kt CO_2 eqv.	1,648.30	1,648.79	1,604.56	1,547.56	1,377.40	1,189.80	755.75	528.41	755.75	528.41
Gases											
CO2 emissions including net CO2 from LULUCF	kt CO_2 eqv.	31,910.07	12,088.09	2,630.34	8,771.42	2,377.47	3,034.38				
CO2 emissions excluding net CO2 from LULUCF	kt CO_2 eqv.	35,825.81	15,040.41	11,816.90	13,959.81	13,620.58	13,032.27	15,554.49	17,668.78	14,659.61	14,223.38
CH4 emissions including net CH4 from LULUCF	kt CO_2 eqv.	6,956.82	4,437.53	3,827.59	3,972.18	3,750.05	3,481.56				
CH4 emissions excluding net CH4 from LULUCF	kt CO_2 eqv.	6,953.94	4,433.46	3,823.66	3,971.22	3,748.81	3,480.78	3,046.50	2,885.31	3,030.07	2,842.90
N2O emissions including net N2O from LULUCF	kt CO_2 eqv.	5,068.34	2,912.25	3,951.23	5,185.04	3,334.82	3,145.57				
N2O emissions excluding net N2O from LULUCF	kt CO_2 eqv.	5,031.89	2,874.22	3,914.00	5,152.64	3,301.25	3,112.44	3,476.16	3,538.27	3,471.05	3,518.14
HFCs	kt CO_2 eqv.	NO	3.29	16.00	81.88	229.71	314.24	284.11	284.11	284.11	284.11
PFCs	kt CO_2 eqv.	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
SF6	kt CO_2 eqv.	NO	0.05	0.72	1.70	5.99	6.32	3.99	3.99	3.99	3.99
NF3	kt CO_2 eqv.	NO	NO	NO	NO	NO	0.06	2.68	2.68	2.68	2.68

CTF Table 7. Provision of public financial support: summary information.

Allocation channels	Lithuanian Litas LTL (European euro – EUR)					US dollars – USD				
	Core /general	Climate-specific [d]				Core /general	Climate-specific [d]			
		Mitigation	Adaptation	Cross-cutting	Other		Mitigation	Adaptation	Cross-cutting	Other
2011										
Total contributions through multilateral channels		100,000 (28,962)	88,847.25 (25,732)				37,461.60	33,173.00		
Multilateral climate change funds [g]										
Other multilateral climate change funds [h]										
Multilateral financial institutions, including regional development banks		100,000 (28, 962)	88,847.25 (25,732)				37,461.60	33,173.00		
Specialized United Nations bodies										
Total contributions through bilateral, regional and other channels		90,000 (26,065)	30,000 (8,689)				33,715.44	11,238.48		
Total		**190,000 (55,028)**	**118,847.25 (340,421)**				**71,177.04**	**44,411.48**		
2012										
Total contributions through multilateral channels				100,000 (28,962)					37,965.07	
Multilateral climate change funds										
Other multilateral climate change funds										
Multilateral financial institutions, including regional development banks				100,000 (28,962)					37,965.07	
Specialized United Nations bodies										
Total contributions through bilateral, regional and other channels										
Total				**100,000 (28,962)**					**37,965.07**	

Allocation channels	Lithuanian Litas LTL (European euro – EUR)					US dollars – USD				
	Core /general	Climate-specific [d]				Core /general	Climate-specific [d]			
		Mitigation	Adaptation	Cross-cutting	Other		Mitigation	Adaptation	Cross-cutting	Other
2013										
Total contributions through multilateral channels		363,800 (105,360)					111,682			
Multilateral climate change funds										
Other multilateral climate change funds										
Multilateral financial institutions, including regional development banks		363,800 (105,360)					111,682			
Specialized United Nations bodies										
Total contributions through bilateral, regional and other channels		31,900 (9,200)					9,752			
Total		**395,700 (114,560)**					**121,434**			
2014										
Total contributions through multilateral channels *(support indirectly related with climate change)*	2,720,988 (788,053)	363,800 (105,360)		172,640 (50,000)		835,336	272,416		53,000	
Multilateral climate change funds										
Other multilateral climate change funds										
Multilateral financial institutions, including regional development banks	2,658,656 (770,000)	363,800 (105,360)		172,640 (50,000)		816,200	111,682		53,000	
Specialized United Nations bodies	62,332 (18,053)					19,136				
Total contributions through bilateral, regional and other channels		523,569 (151,636)					160,734			
Total	**2,720,988 (788,053)**	**887,356 (256,996)**		**172,640 (50,000)**		**835,336**	**272,416**		**53,000**	