



# GHG projections Lithuanian experience

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## Outline

- Lithuania overview
- Reporting requirements
- National key Policies and measures
- National system for GHG projections
- Preparation of GHG projections
- What we learned so far?



## Lithuania overview

- **Area:**  
65 302 km<sup>2</sup>
- **Population:**  
2.92 million (2015)
- **GDP at current prices:**  
36.3 billion (2014)
- **GDP per capita:**  
12 380 EUR (2014)
- EU Member State since 2004



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## Lithuania overview

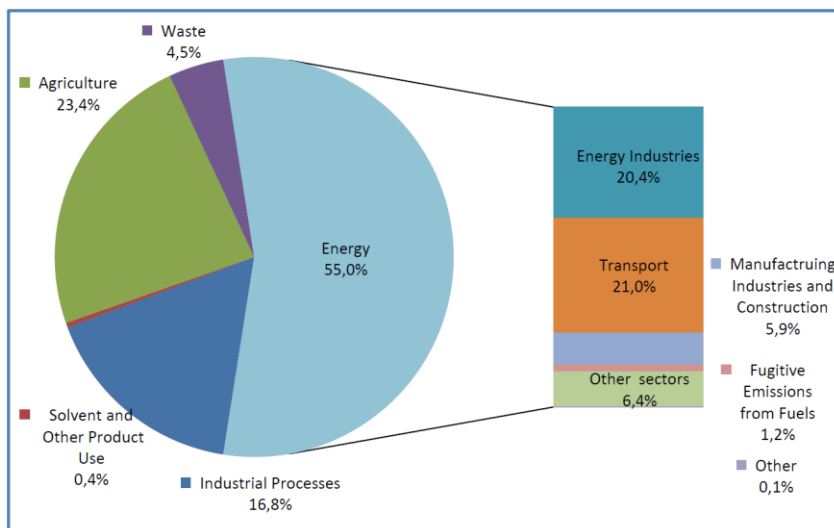
- **GHG emissions in 2012:**  
21622,29 kt CO<sub>2</sub> eq.
- **GHG emissions per capita:**  
7,2 t CO<sub>2</sub> eq.
- **GHG emissions reduction compared to 1990:**  
55,6 %



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## Lithuania overview



Source: NIR 2014

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## Reporting requirements

### **Regulation (EU) No 525/2013 of the European Parliament and of the Council of 21 May 2013** (*hereinafter – MMR*)

- National systems for Policies and measures and greenhouse gas (GHG) projections (Article 12, 13(1)(a) and 13(2))
- Policies and measures (Article 13)
- GHG Projections (Article 14)

### **Commission Implementing Regulation (EU) No 749/2014 of 30 June 2014** (*hereinafter – Implementing Regulation*)

- National systems for policies and measures and projections (Article 20)
- Policies and measures (Article 22 and Annex XI)
- Projections (Article and Annex XII)

### **Biennial report and National communication**

- Next Biennial Report by 1 January 2016 (in accordance with Decision 2/CP.17 of the COP to the UNFCCC)
- Next National Communication by 1 January 2018 (in accordance with Article 12 of the UNFCCC)
- Provide copies to the Commission [MMR Art. 18]

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## Reporting requirements

### GHG projections:

- projections **without measures where available**, projections with measures, and, **where available, projections with additional measures**;
- the impact of policies and measures;
- results of the sensitivity analysis performed for the projections;
- all relevant references to the assessment and the technical reports that underpin the projections.

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## National key Policies and Measure

### Climate change key policies and measures:

- Strategy for the National Climate Change Management Policy by 2050 (2012);
- Action Plan on the Implementation of the Goals and Objectives for 2013-2020 of the Strategy for the National Climate Change Management Policy (2013).

### Cross-cutting policies and measures:

- National Reform Programme (2011);
- National Sustainable Development Strategy (2003, 2011);
- National Progress Programme (2012).

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## National key Policies and Measures

### Sector specific policies and measures:

- National Renewable Energy Resources Development Strategy (2010);
- National Energy Independence Strategy (2012);
- Multi-apartment Buildings Renovation Program (2004, revised in 2013) ;
- Public Building Renovation Programme (2014);
- National Communication Development Program for 2014-2022 (2013);
- Innovation Promotion and Industry Development Program 2014-2020 (2014);
- National Rural Development Program 2014-2020;
- National Plan 2014-2020 for Waste Management (2014).



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## National key Policies and Measures

Lithuanian national policies and measures are implemented by using a combination of various economic instruments and financial mechanisms as well as performance and energy efficiency standards:

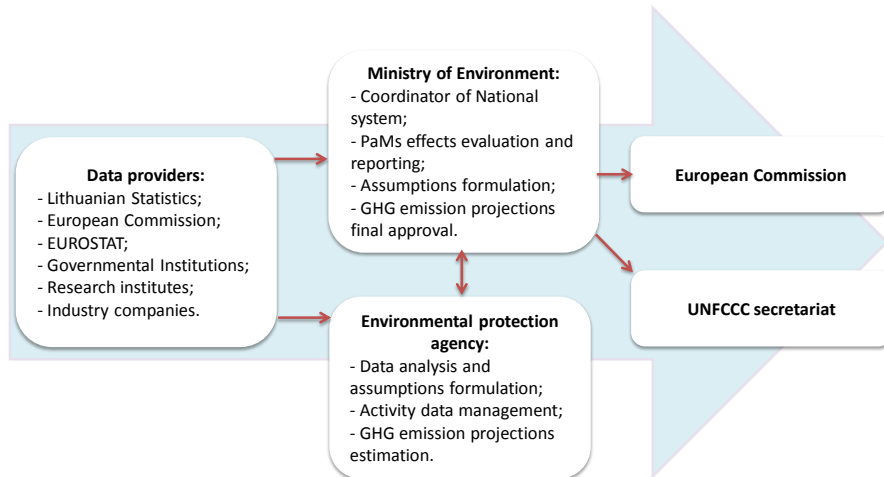
- Law on Environmental Tax insures implementation of “polluter pays” principle and funds received are dispensed under the Environmental Investment Program for the small scale projects in all environmental sectors.
- Revenues received from auctioned allowances under emission trading are collected in Special Program for Climate Change.
- Tariffs and subsidies are applied for the promotion of renewables.
- EU structural and investment funds 2014-2020, from which almost 23% are used for the implementation of climate related projects.



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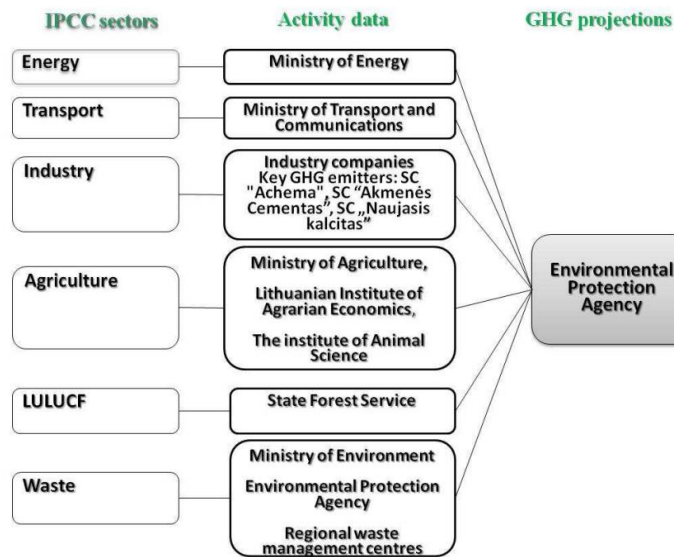
## National system for GHG projections



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## National system for GHG projections



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## Preparation of GHG projections

- Data gathering from data providers (baseline data, projection parameters, projected activity data from various sectors etc.);
- Analysis of gathered data (identification of PaMs that have impact on GHG emissions reduction, PaMs allocation according to scenarios (with existing measures or with additional measures);
- PaMs allocation according to specific sector (public electricity and heat production, road transport, cement production etc.);
- Review and comparison of additional information (e.g. review of ongoing draft update for National energy independence strategy, Lithuanian energy institute study on development of centralized heat production sector etc.);
- Consultation with external experts and companies on possible specific sectors developments (electrification of road transport – slow, fast uptake?);



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## Preparation of GHG projections

- Analysis of statistical data (GHG emissions trends, final energy consumption in different sectors etc.);
- Activity data interpolation/extrapolation (where needed);
- Calculation of GHG emissions using IPCC methodology based on projected activity data;
- Comparison of results (e.g checking if projected GHG emissions are on track with targets set in Strategy for the National Climate Change Management Policy by 2050)

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## Preparation of GHG projections

### Formulation of assumptions in energy sector (Scenario with existing measures)

- Special Program for Climate Change has provided funding for:
  - the biofuel boilers up to 500 kW renovations in commercial/institutional sector. The project is expected decrease the GHG emissions by 82,881 t CO<sub>2</sub> until 2020 (13,813.5 t/year).
  - School renovation projects in sector. By implementing this project it is expected to reduce the GHG emissions by 20,913.66 t CO<sub>2</sub> until 2020 (34,85.61 t CO<sub>2</sub>/year).
- Currently RES amounts to 21,7 % of final energy consumed in Lithuania therefore it was assumed that the target for RES use in final energy consumption balance (23%) will be reached by 2020.
- Existing and planned municipal solid waste incineration plants will determine that that district heat produced from municipal waste in 2020 will amount for 7 % of total supplied district heat.
- 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.

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## Preparation of GHG projections

### Formulation of assumptions in energy sector (Scenario with existing measures)

- Annual GDP growth rate – 3,7 % up to 2030 and 2.2 % up to 2035 (based on LEI projections and data from Ministry of Finance);
- Average electricity demand by 2035 will reach current EU average of 5600 kWh per resident (total demand 13,94 TWh).
- Final fuel consumption in Industry, Construction and Commercial/Institutional sectors would increase annually by 1 % up to 2030 and by 0,7 % up to 2035.
- It was agreed that for the purpose of WEM scenario the EUAs price will remain stable (7-10 EUR/t CO<sub>2</sub> eq.)

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## Preparation of GHG projections

### Calculating GHG emissions in energy sector

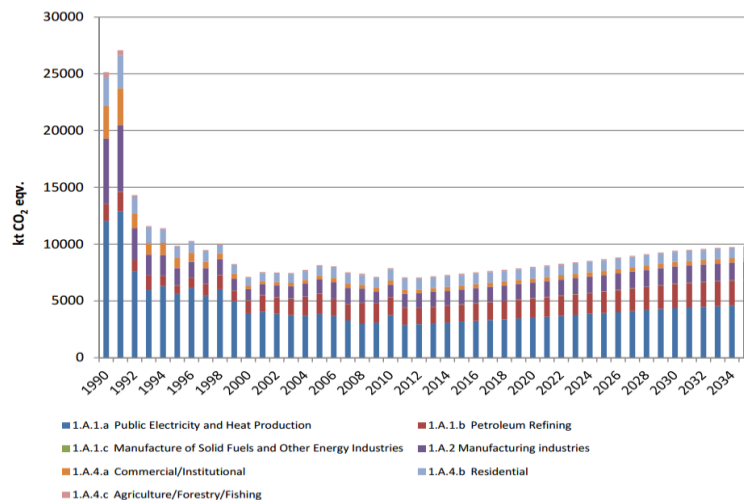
- Latest GHG projections were based on final energy consumption data provided in the Energy sector development study developed by the Lithuanian energy institute (LEI) in 2013.
- Public electricity and heat production sector projections were based on forecasted total electricity demand in Lithuania.
- Assumptions made by LEI were revised. Measures not present in LEI study were added.
- Results compared to targets defined in Strategy for the National Climate Change Management Policy.
- Results compared to other available studies.

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## Preparation of GHG projections

### Estimated GHG emissions in Energy sector\*



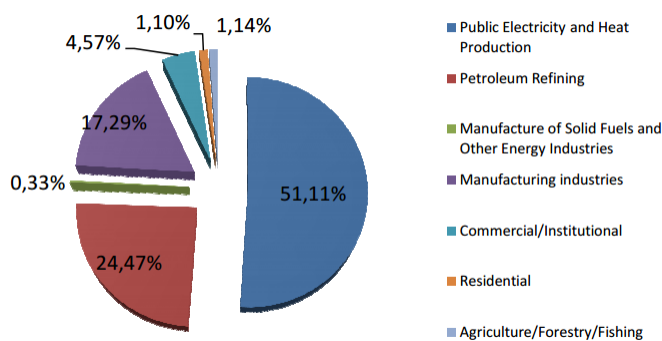
\*Transport sector not included

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## Preparation of GHG projections

Estimated share of GHG emissions by sub-sector in 2035



GHG emissions are estimated to reach a total of 9.838.32 kt CO<sub>2</sub> eq.

**Key sectors:**

- Public electricity and heat production;
- Petroleum refining;
- Manufacturing industries;

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## Preparation of GHG projections

Calculating GHG emissions in transport sector

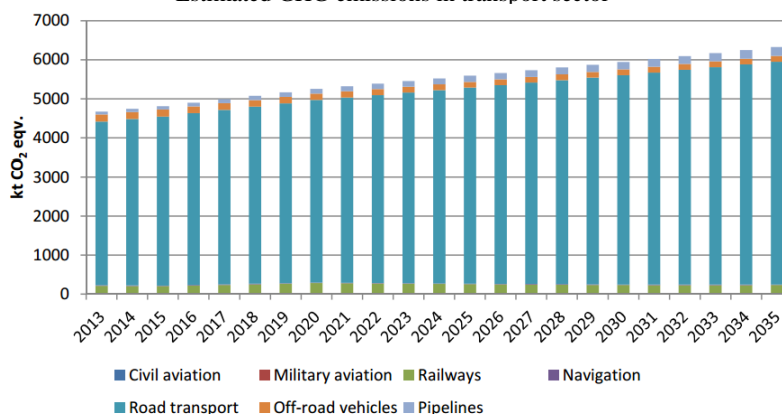
- GHG projections in transport sector were based on the data provided by the Ministry of communications.
- Data included projected fuel consumption in civil and military aviation sector, railways sector.
- Fuel consumption in road transport was projected based on increase of registered vehicles in Lithuania (statistical data received from state enterprise Regitra).
- Results compared to targets defined in Strategy for the National Climate Change Management Policy.

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## Preparation of GHG projections

Estimated GHG emissions in transport sector



GHG emissions from transport sector are projected to increase up to 6,323 kt CO<sub>2</sub> eq. in 2035 due to increasing number of road vehicles and increasing transportation of natural gas in pipelines.

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## Preparation of GHG projections

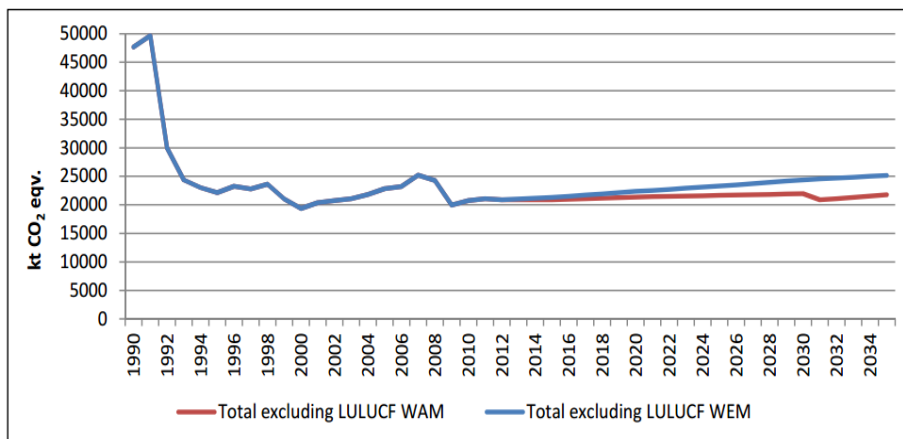
Formulation of assumptions in energy sector  
(Scenario with additional measures)

- National Energy Independence Strategy refers to the construction of the Visaginas nuclear power plant as the main target in securing energy independence (operation start foreseen in 2030) ;
- Additionally 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 %.
- According to data provided by the Ministry of Communications the increased uptake of RES up to 31% would decrease the use of gasoline and diesel oil by 25.8 ktne in transport sector by 2030.

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## Preparation of GHG projections



According to projected GHG emissions in case of WAM scenario additional implemented measures will result in total 3187 kt CO<sub>2</sub> eq. (excluding LULUCF) decrease compared to WEM scenario in 2035.

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## Preparation of GHG projections

- GHG emissions are projected according to European Union Emission trading scheme (Directive 2003/87/EC) (mostly energy and industry sectors) and sectors that fall under the Effort sharing decision (Decision No 406/2009/EC) (medium and small industry installation less than 20 MW, agriculture, waste, transport (excluding aviation), services, household etc.);
- Lithuania has about 90 installation that fall under the EU ETS. They amount to approximately 37% of total national GHG emissions. EU ETS GHG emissions reduction target is set to -21% for 2020 compared to 2005;
- Non-ETS emissions in Lithuania amount to approximately 63% of total national GHG emissions. National non- ETS target for 2020 is allowed to increase GHG to more than 15 % above 2005 level.

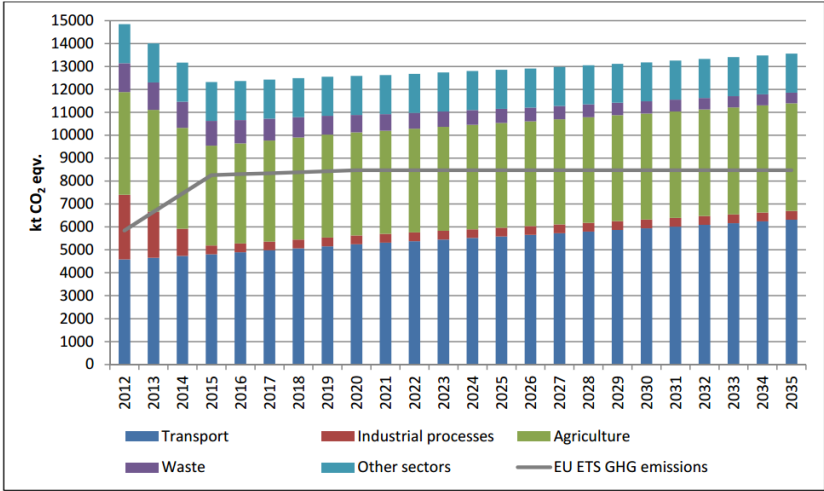


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## Preparation of GHG projections

Projected GHG emissions in EU ETS and ESD sectors (WEM scenario)

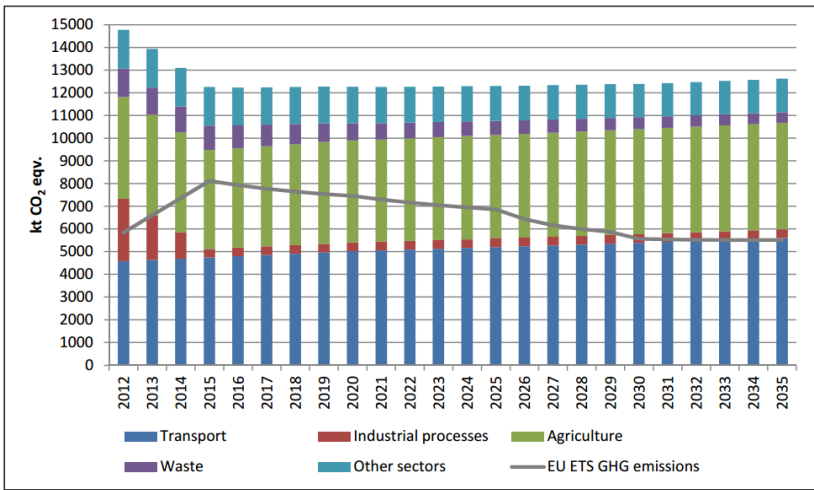


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## Preparation of GHG projections

Projected GHG emissions in EU ETS and ESD sectors (WAM scenario)

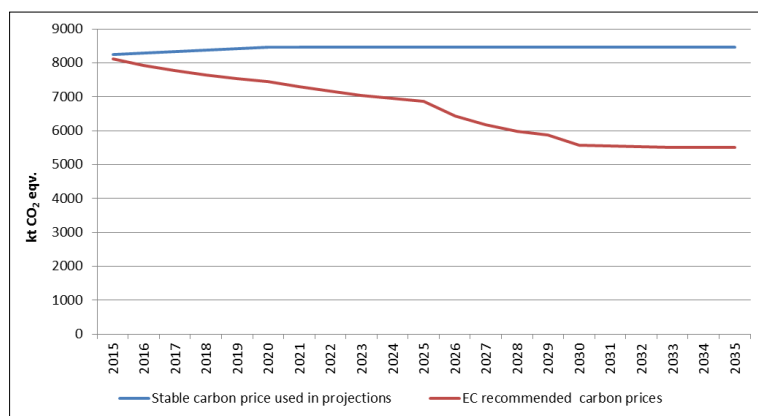


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## Preparation of GHG projections

GHG emissions sensitivity analysis in EU ETS sector



EC recommended price	2015	2020	2025	2030	2035
EUR/t CO <sub>2</sub> e	7	10	14	35	57

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## What we learned so far?

- Communication and cooperation between governmental, research institutions, companies, external experts is invaluable for preparation of GHG emissions.
- Modeling system required for preparation of GHG projections. Currently under consideration in assistants project with Norwegian colleagues (LEAP?).
- Careful planning required due to overlap with preparation of NIR.
- Deep analysis of PaMs required. Sometimes planned measures does not reflect current situation (e.g consideration of constructing a nuclear power plant in Lithuania is currently on-hold).

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