



# Calculation of GHG projections in Latvia

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# Overview



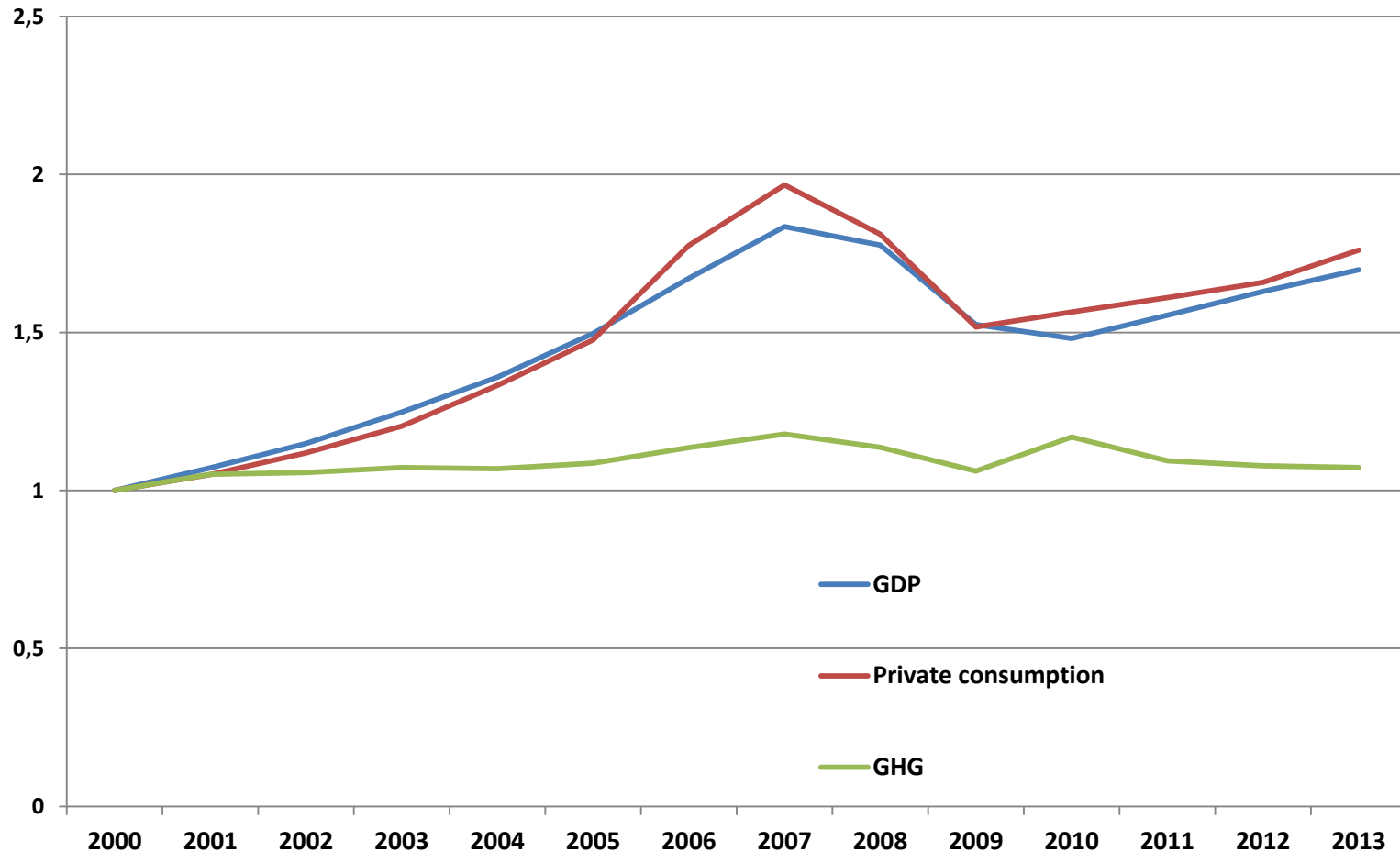
- Introduction
- Methods and models
- Sensitivity analyses
- Projections for road transport

# Introduction

- Projection calculation is not forecasting. It is based on the same structure as national inventory;
- There are involved experts from different institutions in a calculation of projections: LAU, IPE, LEGMC, SRI “Silava”;
- Mainly based on the same AD projections/assumptions it is calculated projections for air pollutant emission as well.

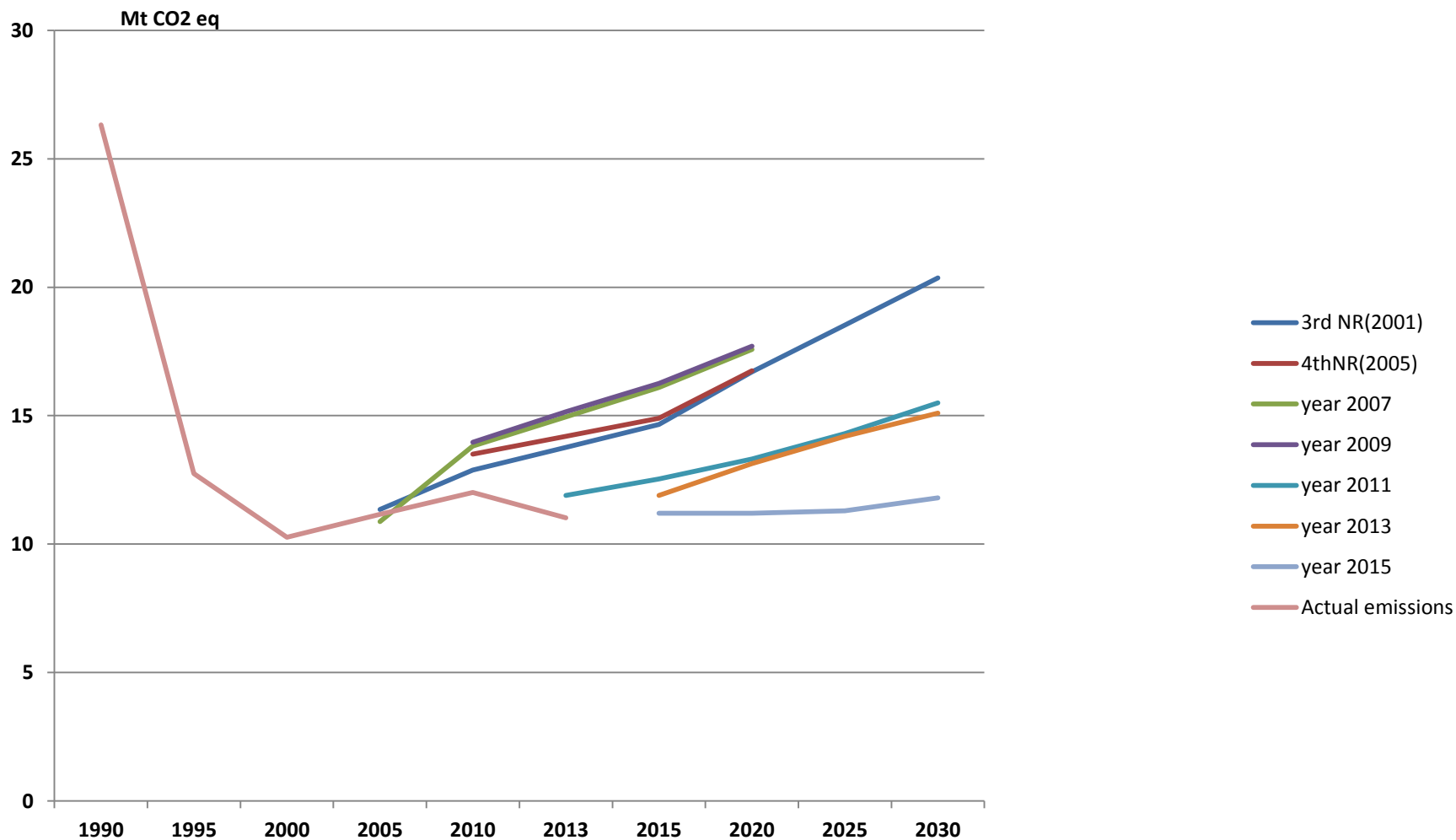


# Economy development and GHG emissions in Latvia



**GDP growth 70%; GHG emission growth 7.3%**

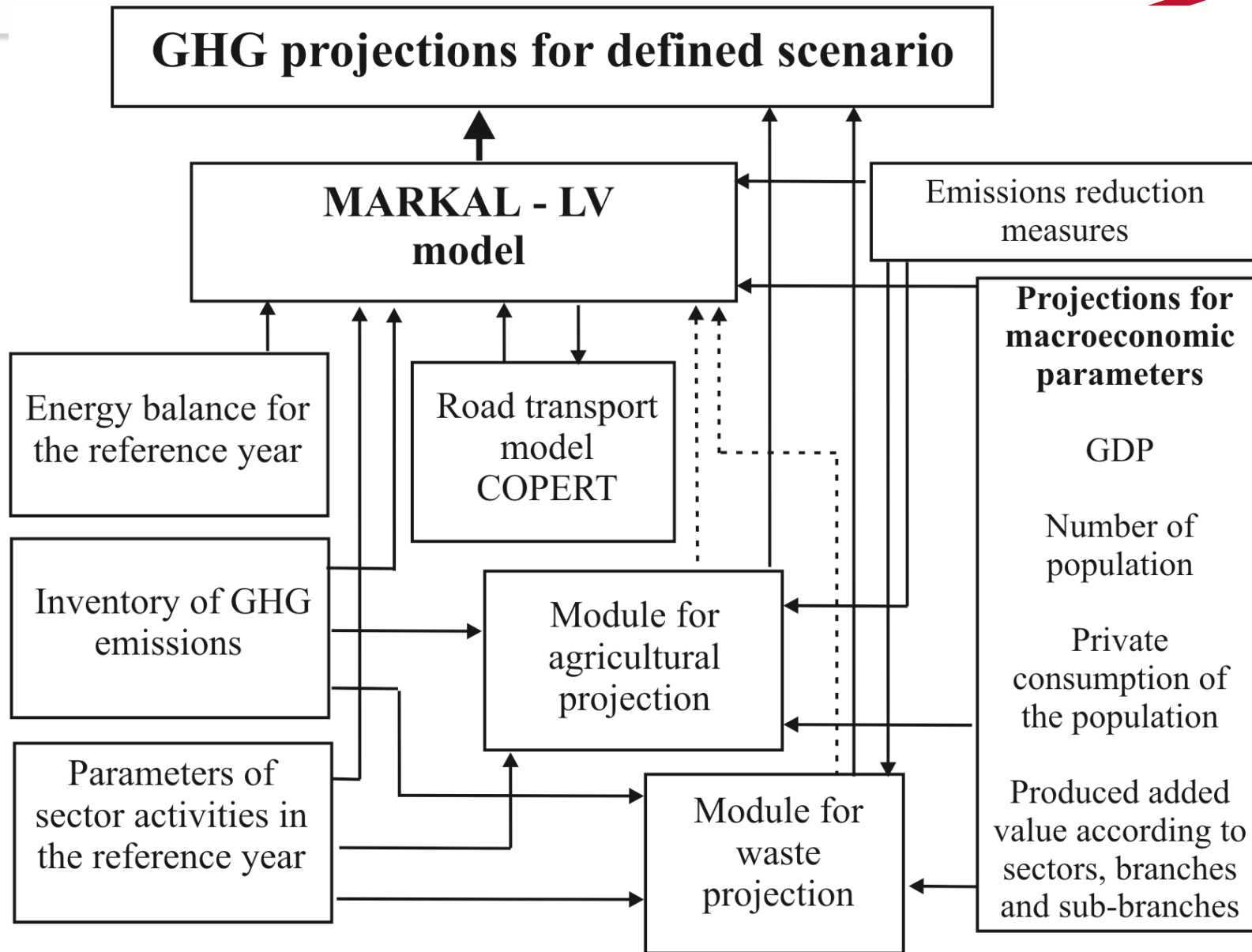
# GHG projections (2001 – 2015)



# Approach for scenario definition

- Two scenarios are produced showing a different outlook for emissions levels depending on the level of policy implementation;
- *With Existing Measures* or ‘worst case’ scenario assumes that no additional policies and measures, beyond those already in place by the end of 2014, are implemented;
- *With Additional Measures* or ‘best case’ scenario assumes that Government policies and measures for 2020, for example renewable fuels and energy efficiency targets, will be fully implemented. Planned policies and measures include the renewable energy targets and energy efficiency targets as set out in the National Renewable Energy Action Plan (NREAP) and the National Energy Efficiency Action Plan (NEEAP).

- MARKAL and COPERT models in Energy and Road transport sector;
- Agriculture sector – mathematical model (Trend model) in combination with and expert judgments;
- Other sectors – trend analyses model;
- Input data from: CSB, MoE, TSO reports, sector policies document for PAMs definition.

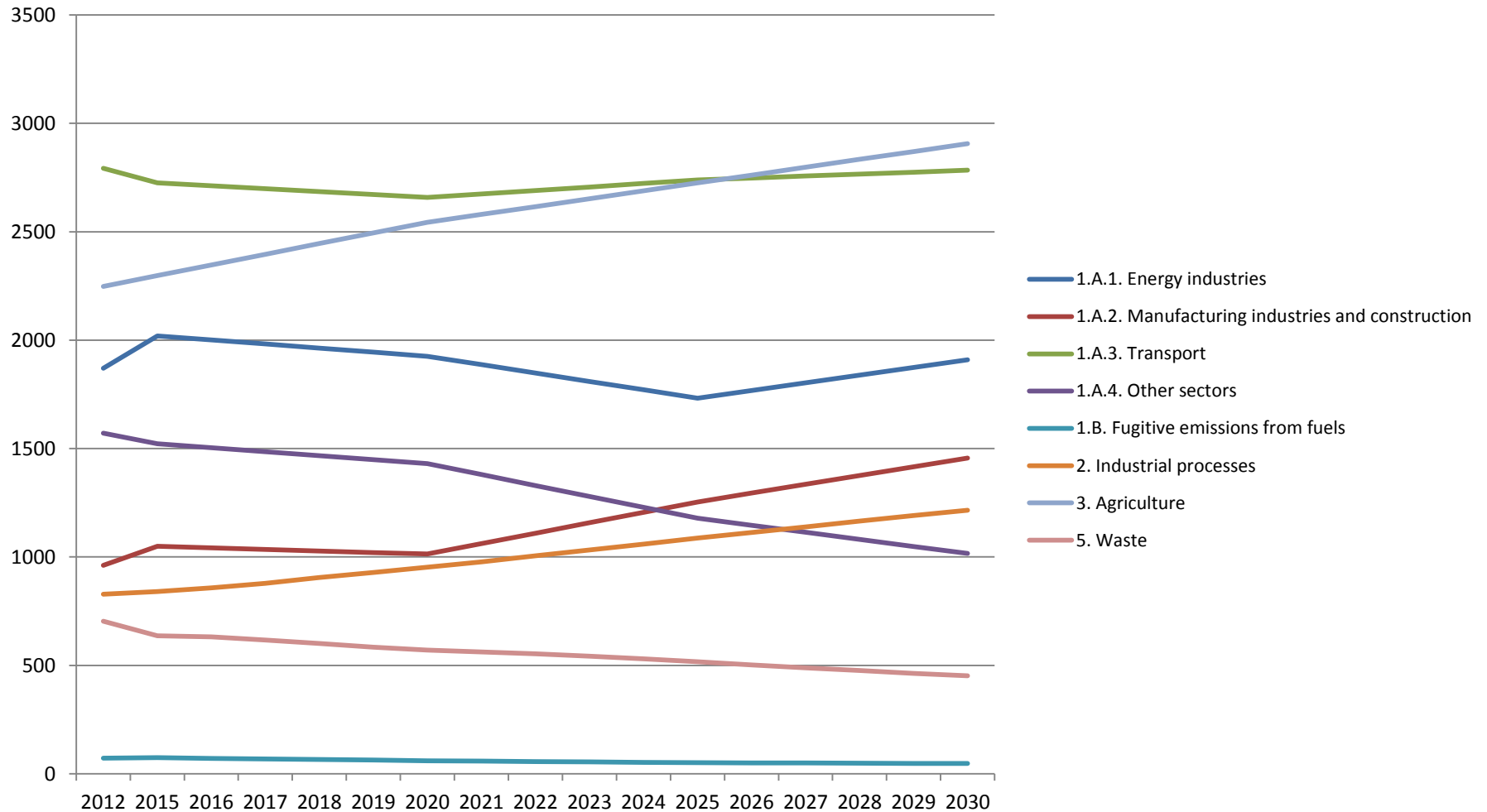




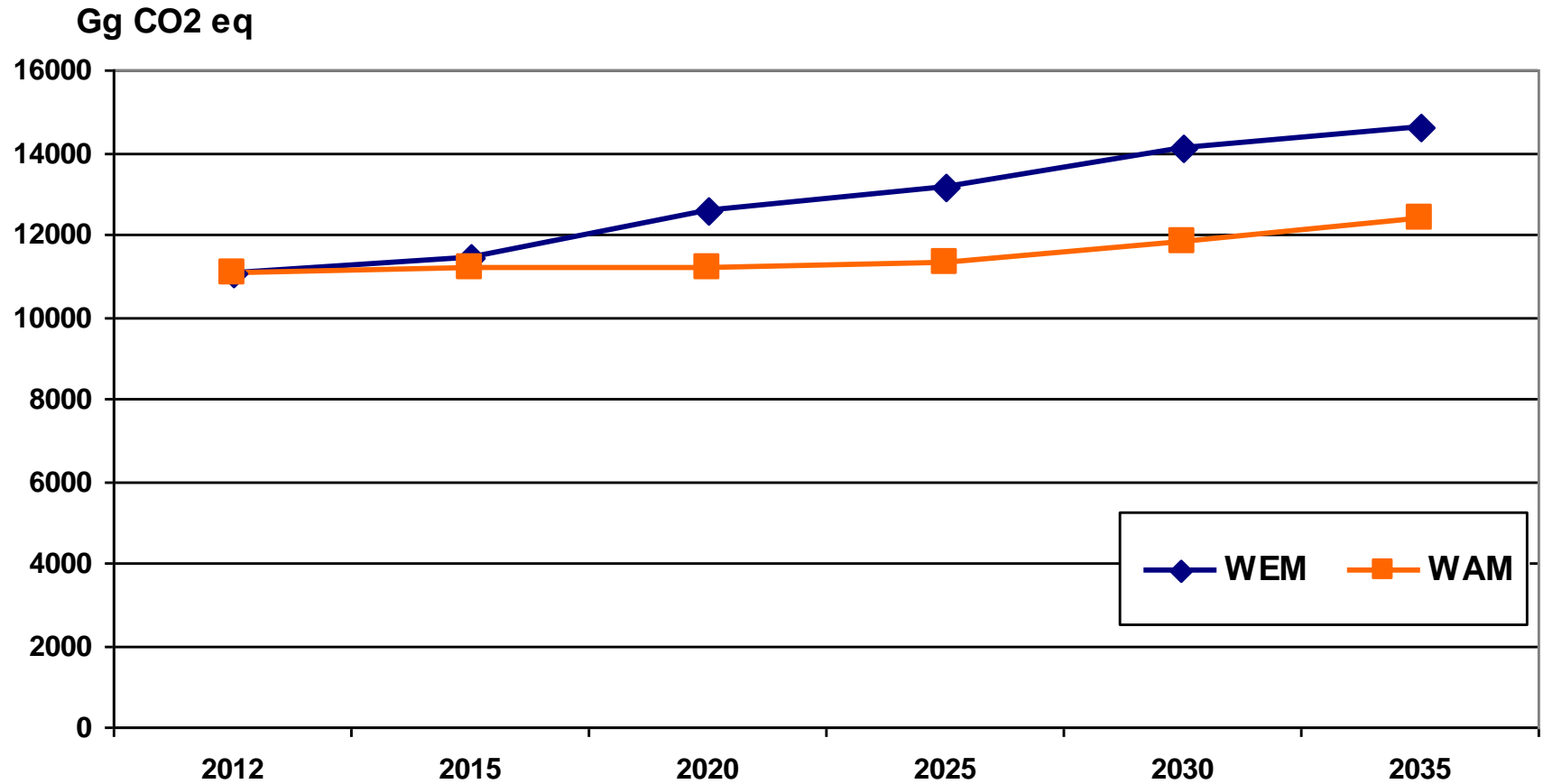
# Data exchange among sectors

- To ensure consistency of GHG projection calculation in different sectors it is necessary AD exchange among sectors;
- For example:
- number of cars (road transport) → share of cars with air conditioning → calculation of F-gases;
- Population → number of dwellings → floor area of dwellings → number of households (energy sectors) → number of refrigerators (electricity consumption) → number of refrigerators → calculation of F-gases.
- Biogas CHP installations (MW energy sector) → ha for maize or other → t of mineral fertilizers (agriculture sector) → calculation of N<sub>2</sub>O emissions.

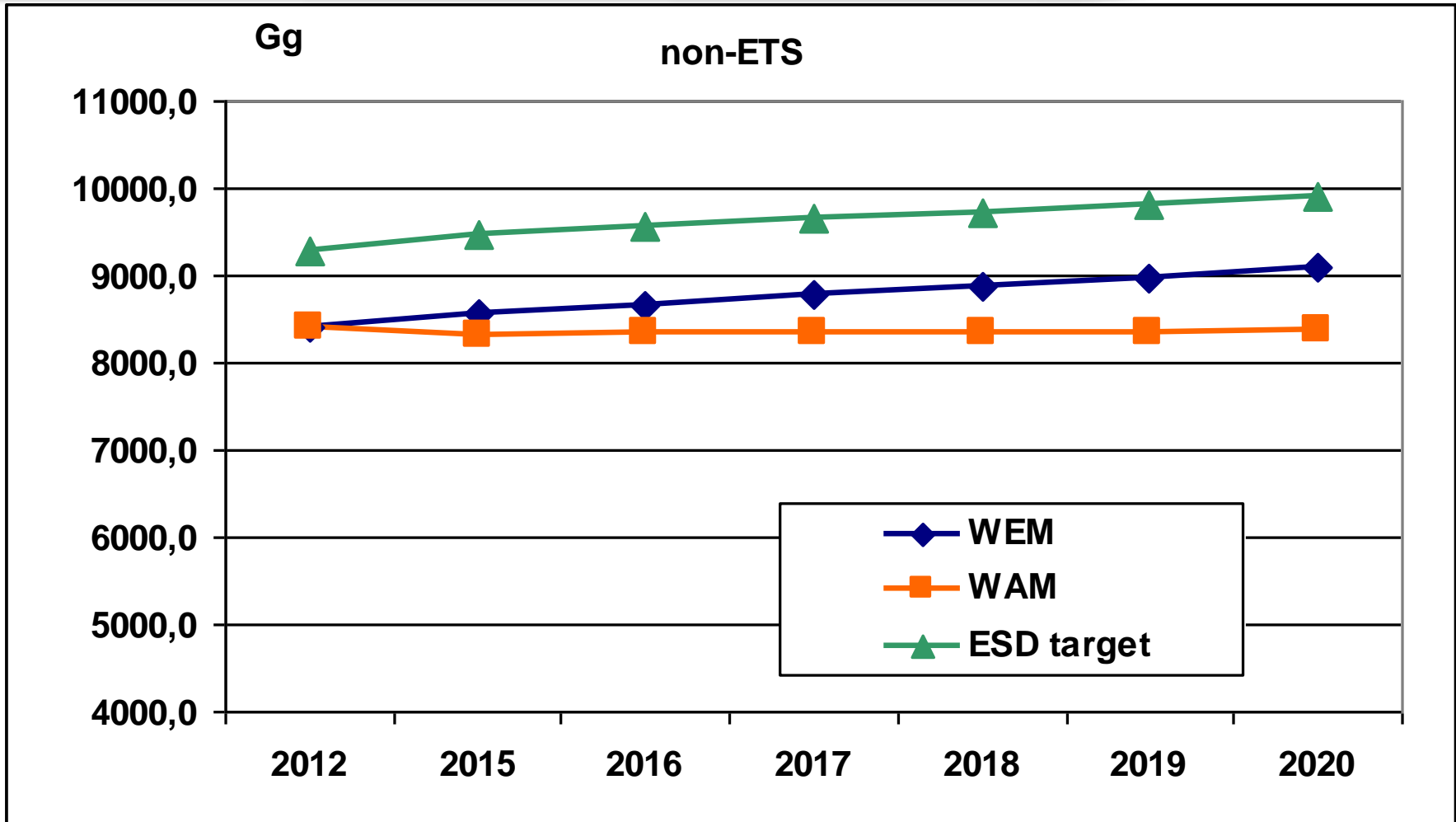
# GHG projection in WAM scenario by sectors



# Total GHG emissions under the WEM and WAM scenarios



# Projected total GHG emissions under the WEM and WAM scenarios in the non-ETS sector



**non-ETS emissions in WEM scenario (year 2020) has increased by +8% against 2005**

# Assessment of PAMs impact

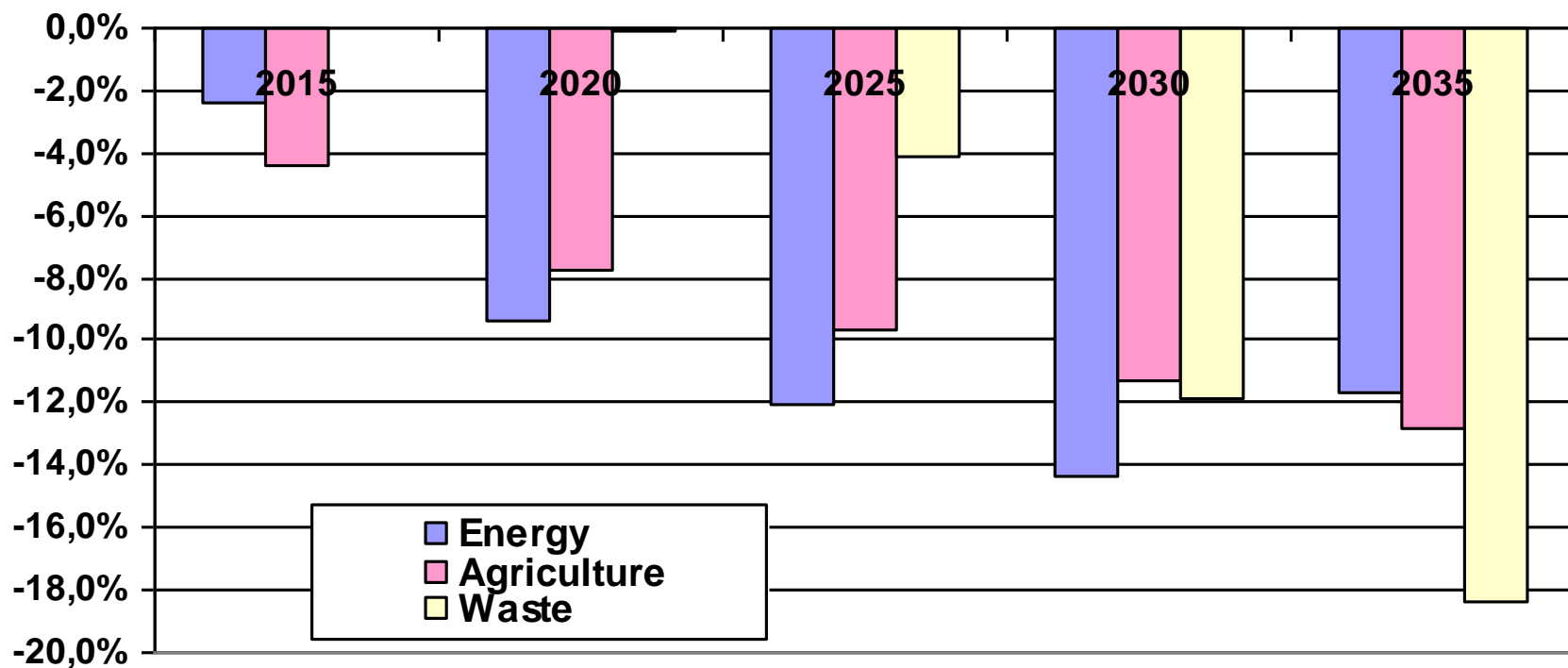
- Bottom-up (ex-post) and top-down approach for PAMs in WEM scenario;
- Top-down approach for PAMs in WAM scenario.

# Impact Assessment of included PAMs in WEM scenario, CO<sub>2</sub>

	Period 2007-2013 (ex-post)	Period 2014-2020 (Ex-ante)	
	2020	2020	2023
Biomass boiler houses	169,9 kt	59,5 kt	39 kt
EE Improvement of DHS	50,1 kt	12,6 kt	12,4 kt
Residential sector: EE improvement in multi family houses	43 kt	26,4 kt	13,6 kt

# Emission reduction in the non-ETS sectors under the WAM scenario

### WAM vs WEM non-ETS

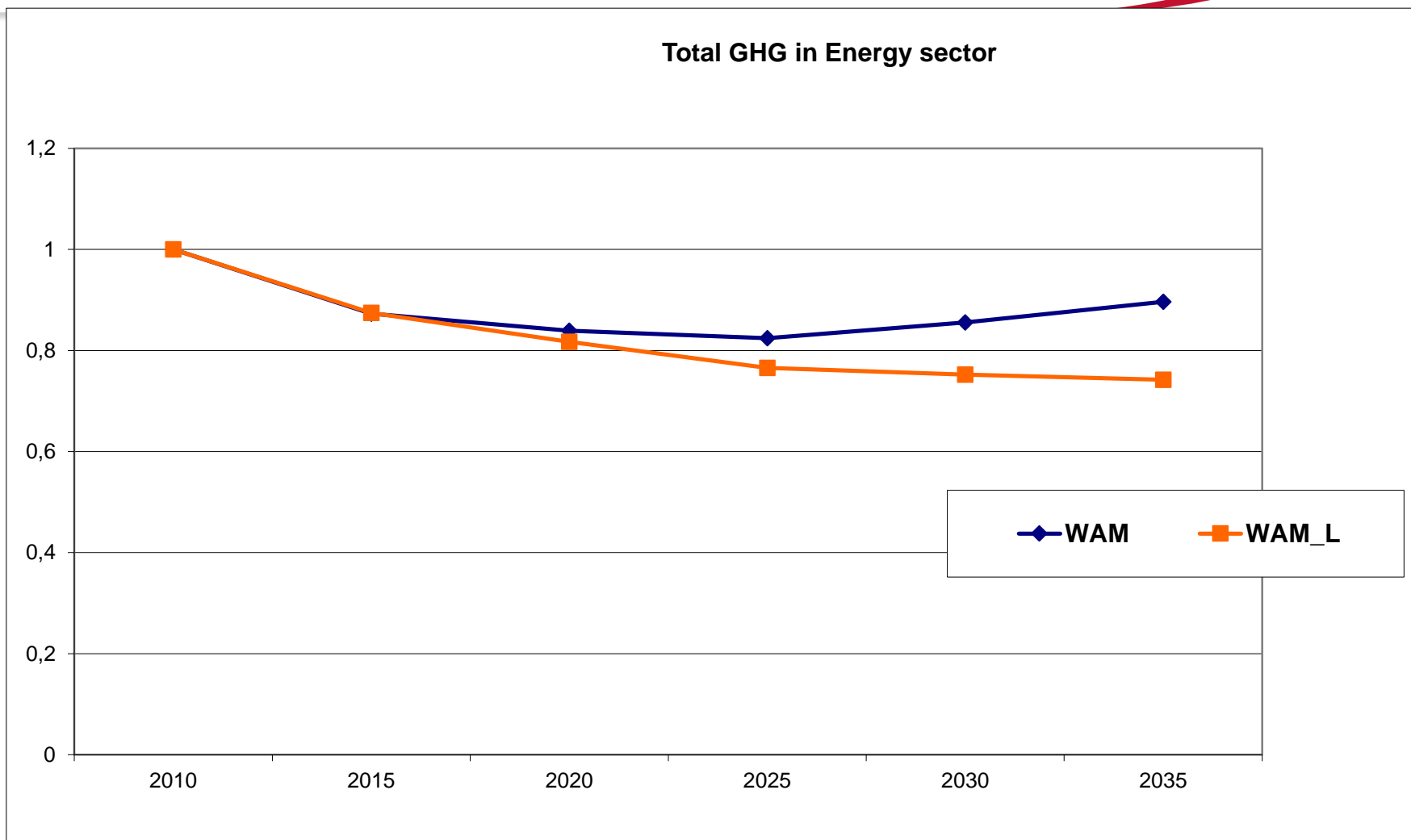


# Sensitivity analyses

- Sensitivity analyses is important stage for evaluation of emission projections in Latvia;
- For sensitivity analyses more important parameters for Latvia are used:
  - GDP growth;
  - Share of imported electricity;
  - Implementation rate of regulation

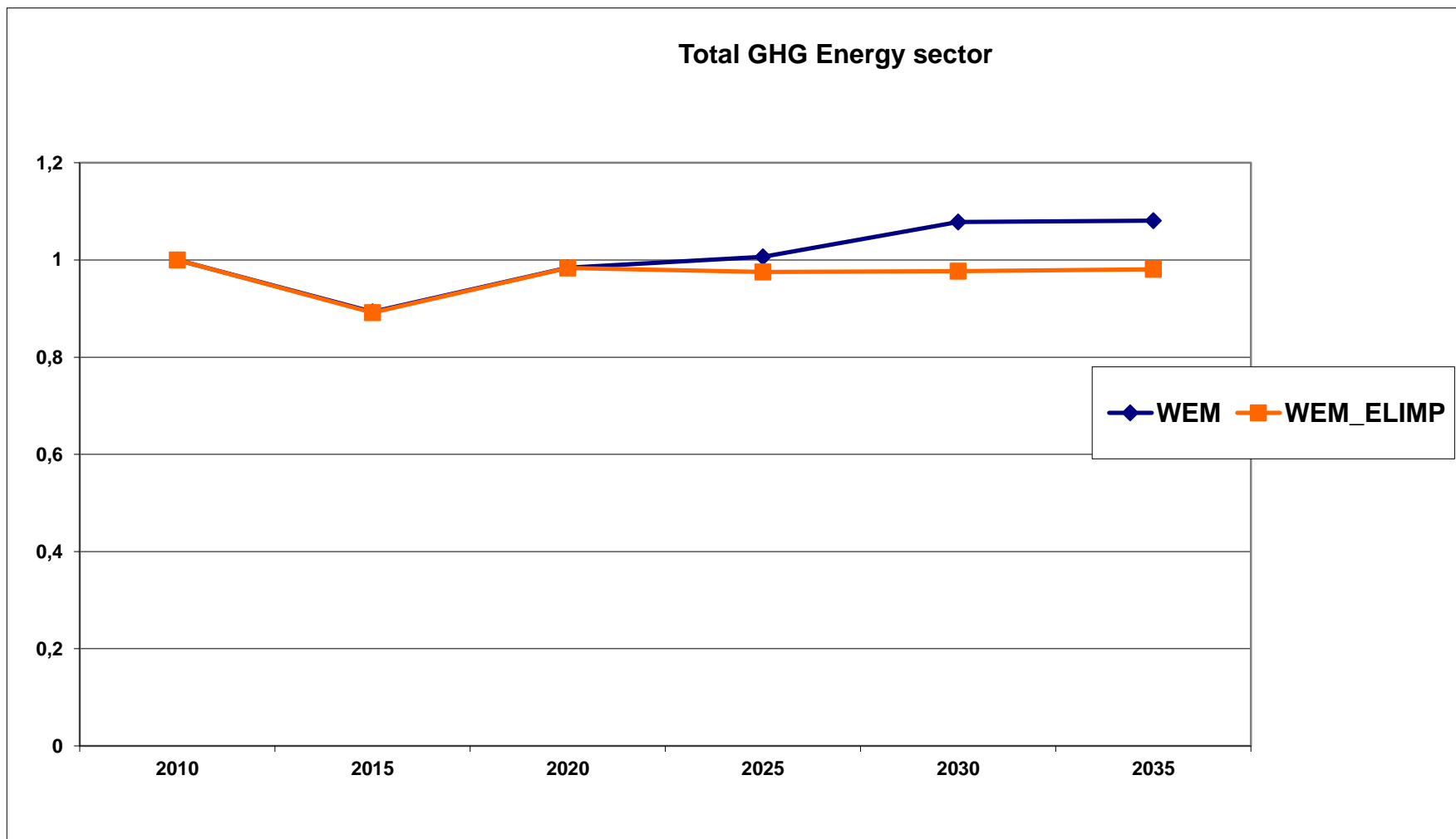


# Results of sensitivity analysis in the energy sector on the impact of assumptions for lower GDP growth



**Difference is 11% in year 2030**

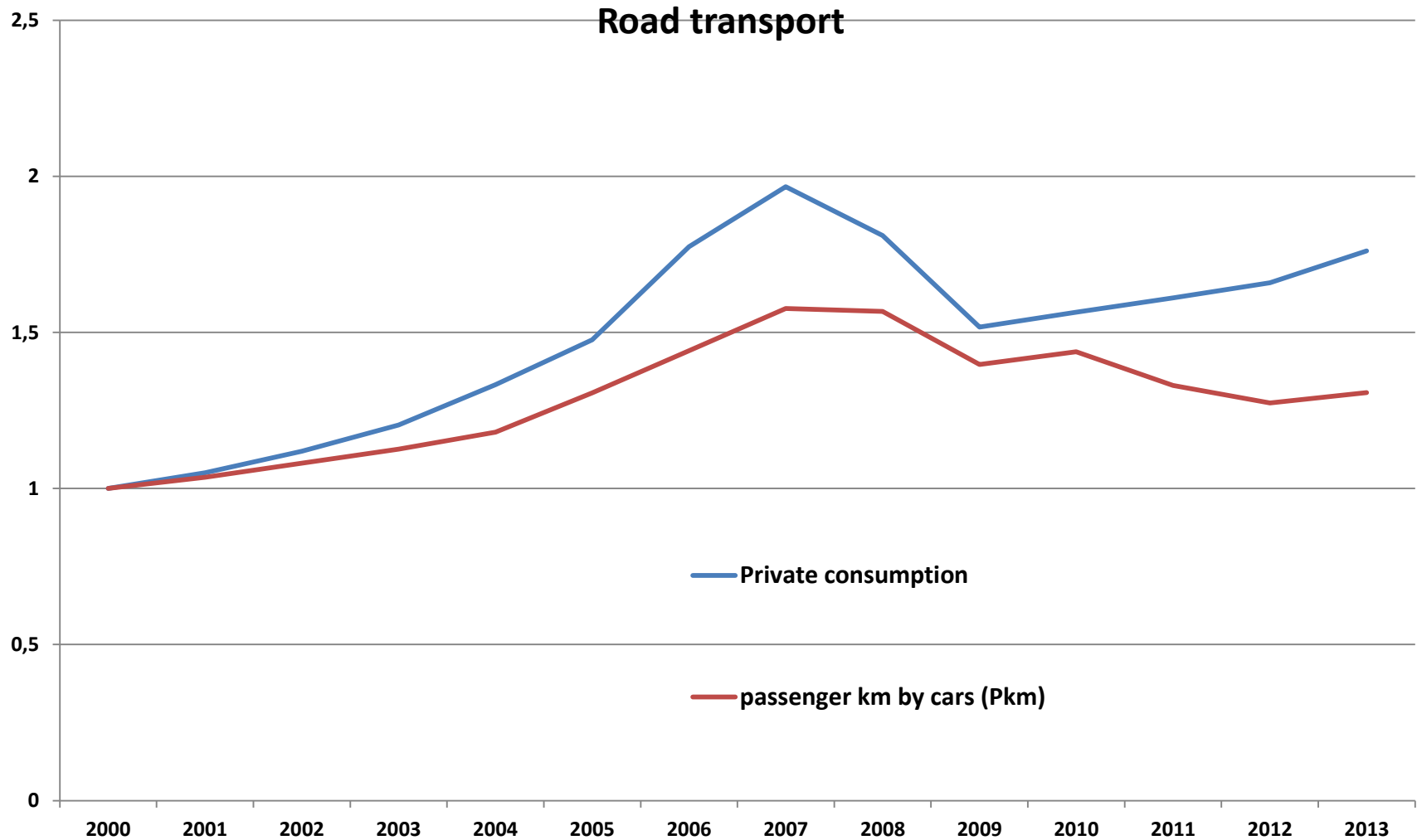
# Results of sensitivity analysis in the energy sector on the impact of assumptions for higher electricity import amount



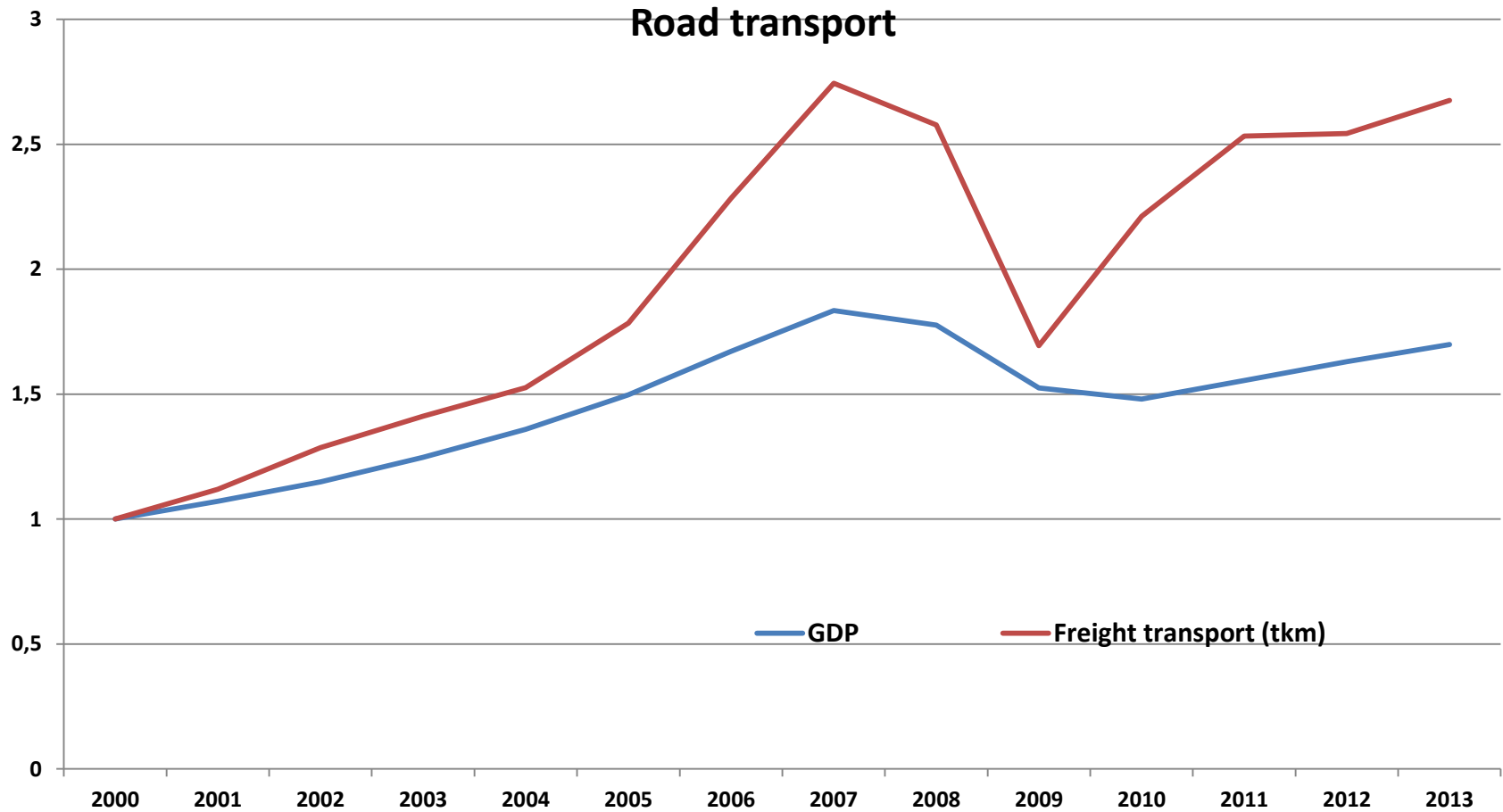
**Difference is 10% in year 2030**

# Road transport sector

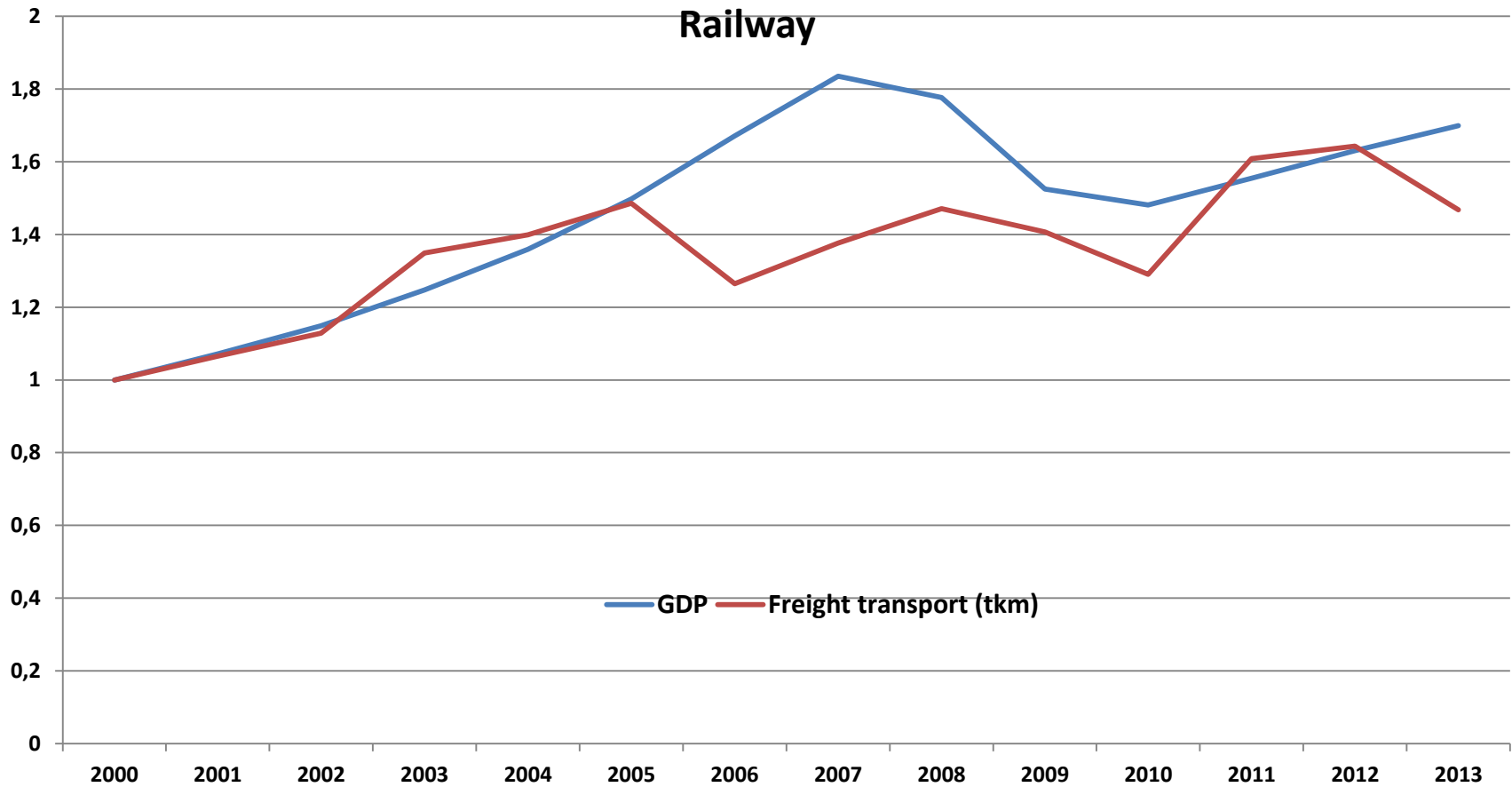
# Parameters for AD projections for passenger cars



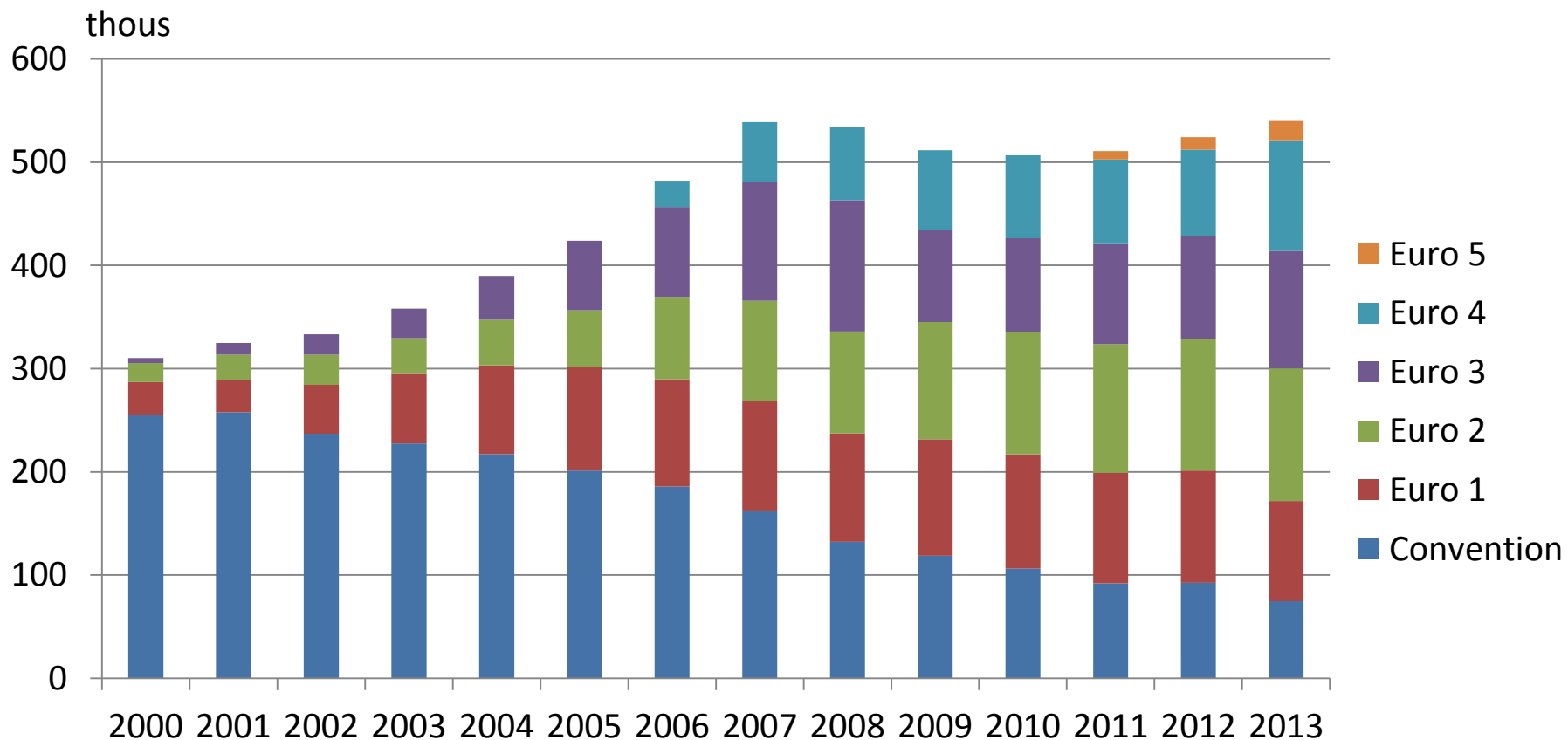
# Parameters for AD projections for freight transport (HDV and LDV)



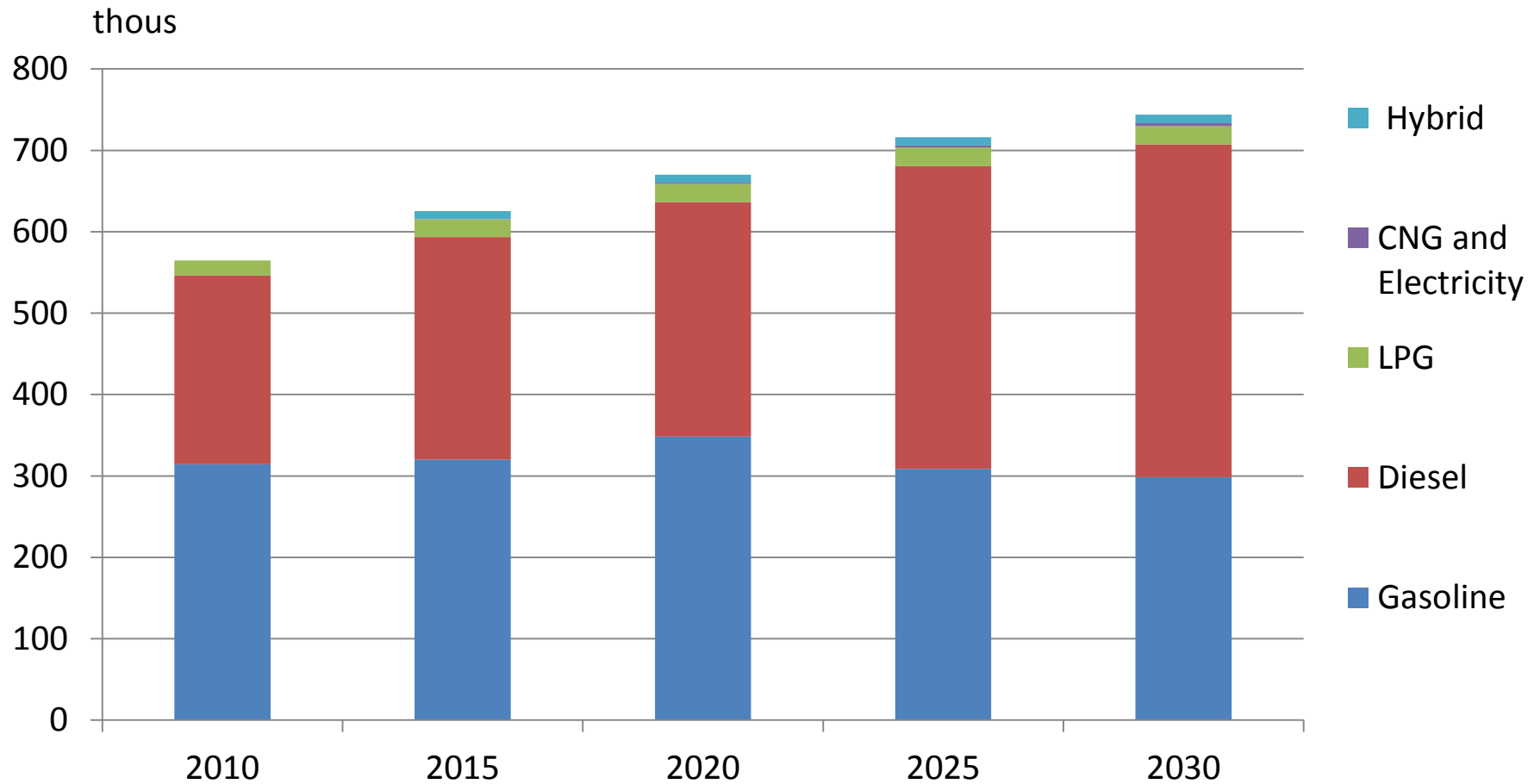
# Parameters for AD projections for freight transport in railway



# Distribution of passenger cars by classes



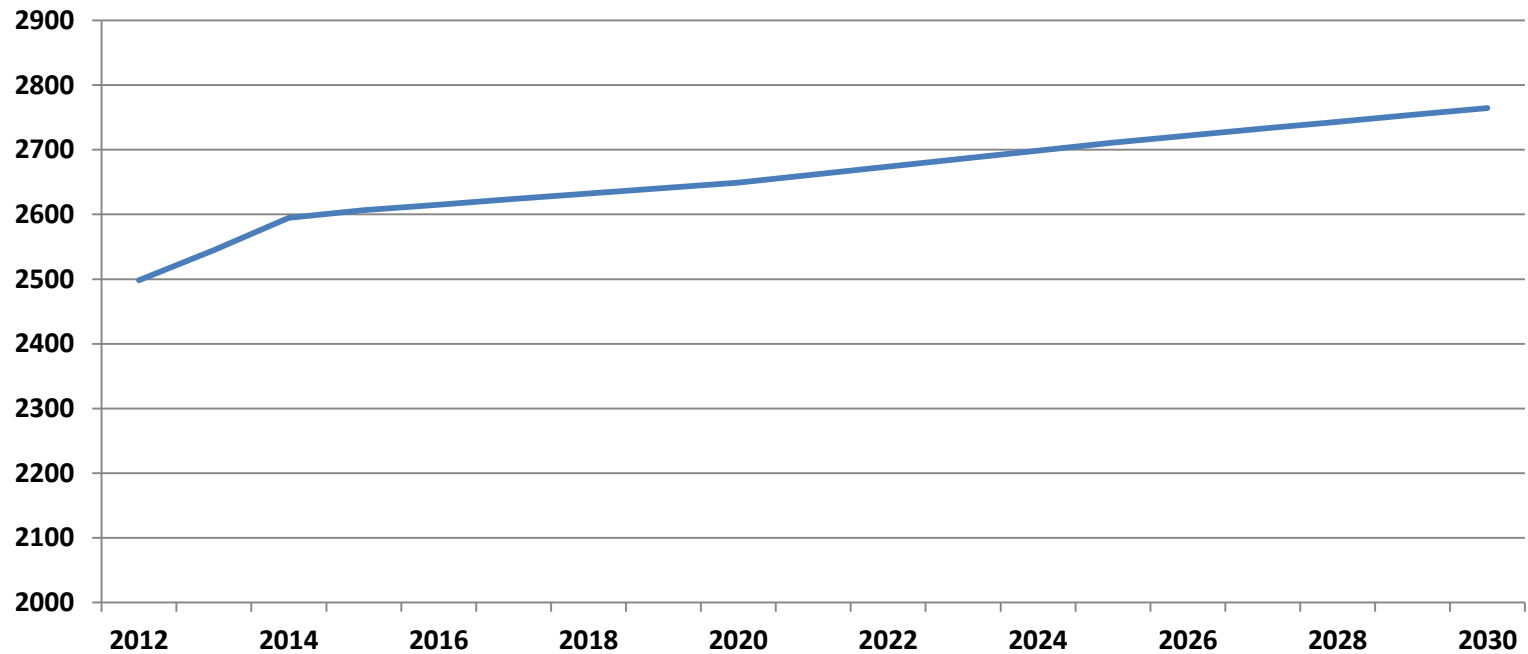
# Distribution of passenger cars by used fuel





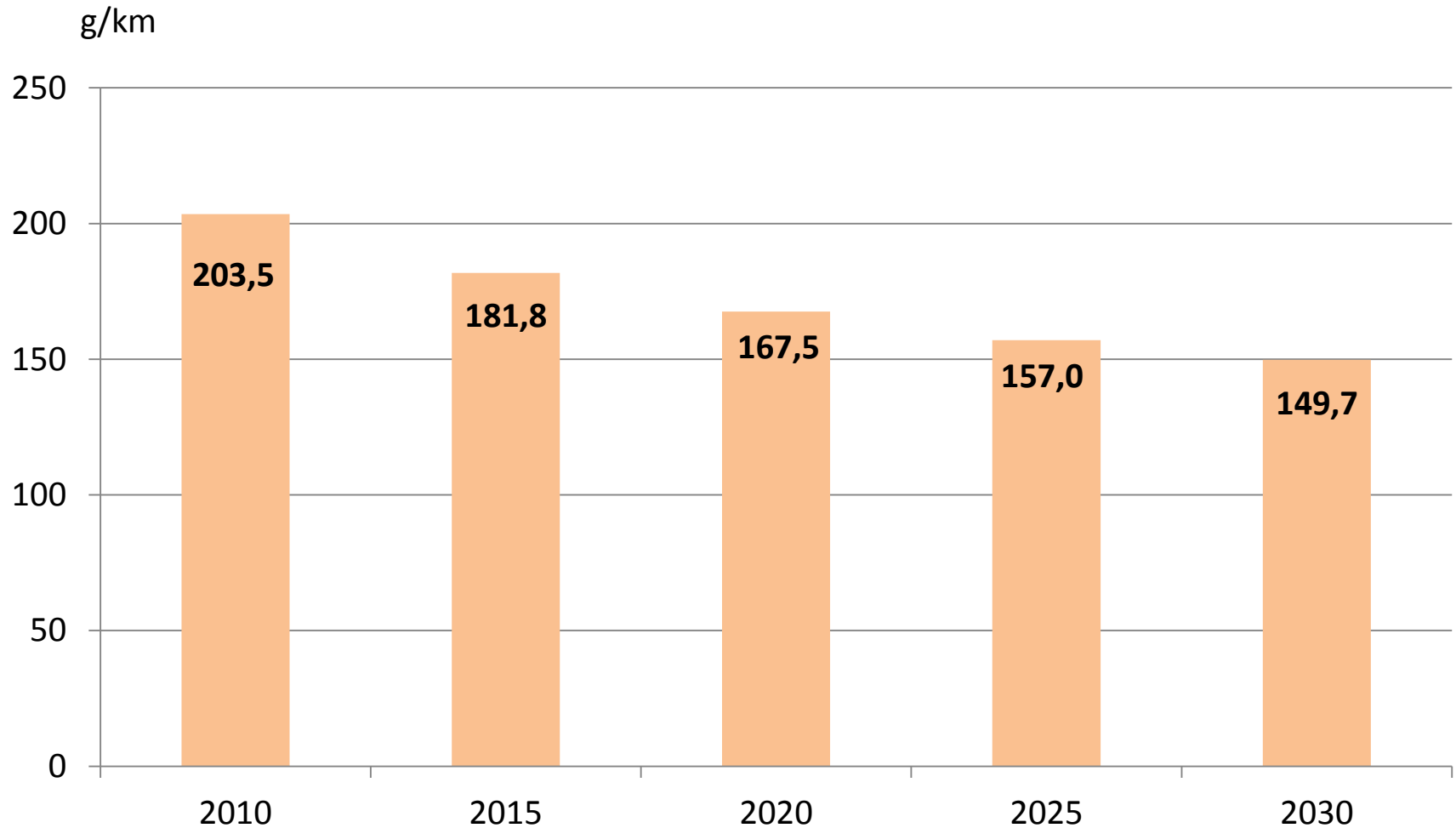
# GHG projection in road transport (WEM scenario)

kt CO2 eq

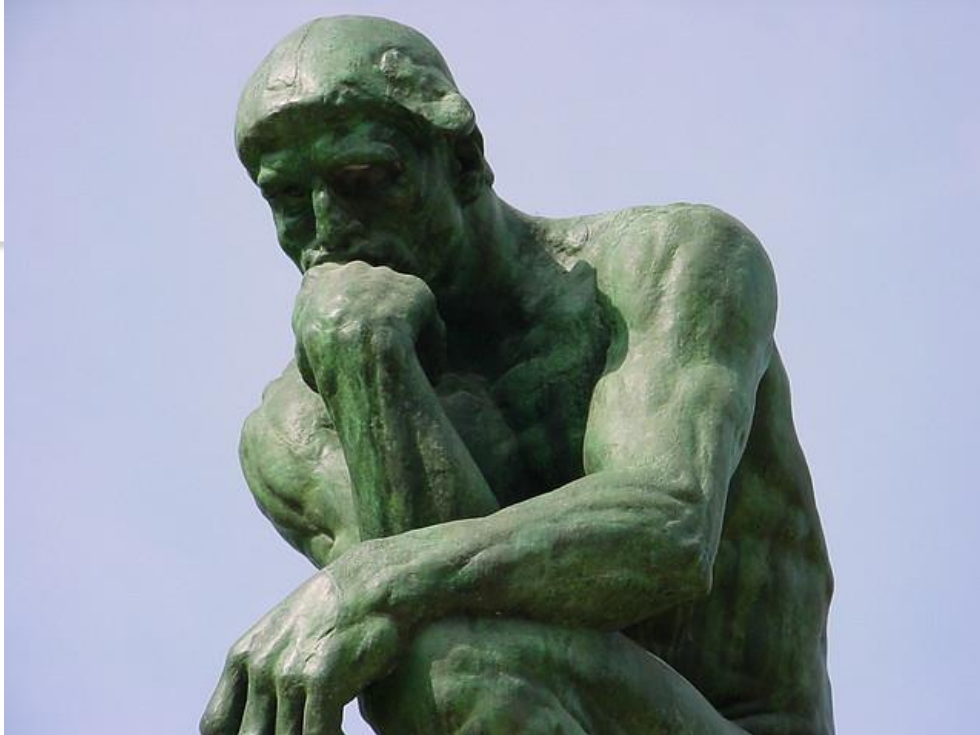


**GHG emissions will increase by 8.7% in year 2030 compared to 2012**

# Results in WEM scenario: Passenger cars



**Value for indicator has decreased by 24%**



ICELAND  
LIECHTENSTEIN  
NORWAY



How improve calculation of projections?

Thank you for attention!

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