Ministry of Foreign Affairs of the Republic of Lithuania

Costs of implementing Lithuanian commitments in case of the EU's move to 30 % reduction of greenhouse gases emissions

Summary

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"Costs of implementing Lithuanian commitments in case of the EU's move to 30% reduction of greenhouse gases emissions" (thereinafter – the Study) covers these main topics: forecast of primary and end-use energy consumption until the year 2020, evaluation of energy saving potential, forecast of emissions of greenhouse gases (thereinafter – GHG) until the year 2020, evaluation of the possible scenarios of GHG emissions limits allocation between the EU member states pursuing the 30 % GHG emission reduction, costs of fulfillment of the commitments on 20 % emissions reduction, fulfillment of 30 % emissions reduction target in the emission trading system (thereinafter – ETS) and non-ETS sectors. The assumptions made in the Study are described in the Annexes. The review of the measures for GHG emissions reduction and detailed evaluation of certain measures, comparative values of GHG emissions, impact of targeting at 30% reduction on competitiveness of Lithuanian industry and review of benefits from pursuing the 30 % reduction goal are to be found in the Annexes as well.
The Study consists of the report and 12 Annexes.

1. Forecast of energy resources and energy consumption and energy-saving potential

Forecast of the primary and end-use energy consumption until the year 2020, following the base-case, pessimistic and optimistic scenarios, was carried out to evaluate the change in GHG emissions until the year 2020. Base-case, pessimistic and optimistic scenarios stand for different economical development scenarios based on the different forecasts of Total Value Added growth. The forecasts are based on the prognoses by the Ministry of Finance, Central Bank of the Republic of Lithuania and European Commission published in spring 2010 for the period 2010–2011 and on slow and fast economical growth scenarios provided in the National Energy Strategy. The detailed description of assumptions used in the calculations is to be found in the Annex 1 of The Study. Only the main are stated below:
- Insulation of residential and public buildings will be carried out. 50 % of residential buildings are to be modernized until the year 2025 in case of the base scenario;
- The targets of renewable energy use, as set by the National Development Strategy of the Renewable Energy Sources, will be accomplished;
- The electricity sector is targeting at maximising the provision of electricity by own installed capacities in accordance with the principle of security of energy supply. It is expected that new unit at the Lithuanian Power Plant will be launched in 2013;

- CHP plants will perform at the maximum based on the heat demand in the country. Export of electricity is not expected;
- Electricity production in the power plants is prioritised by the production from renewable energy sources followed by CHP plants, depending on the useful heat demand;
- Start of nuclear power plant is not expected until the year 2020;
- Determining the demand of the primary energy to satisfy the general needs of the country, the change of costs of transportation and transmission, also coefficients of transformation in heat and electricity production sectors are evaluated

Forecast of primary and end-use energy for base-case scenario is presented in figures 1 and 2.

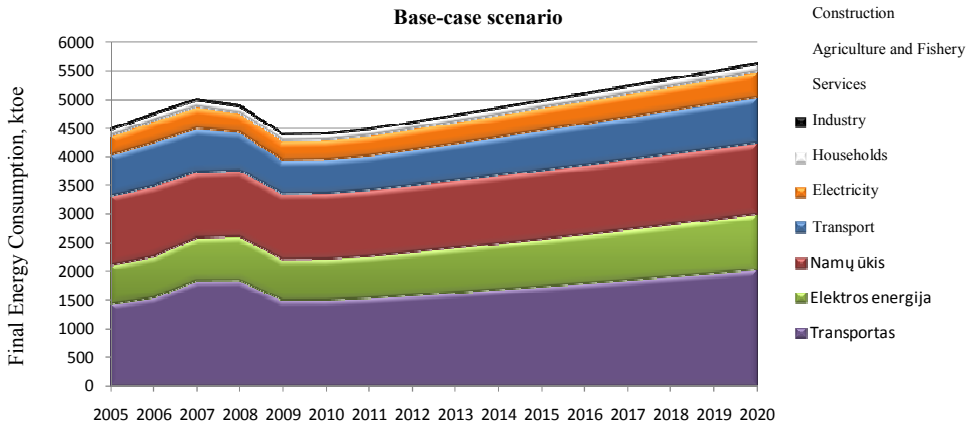

Figure 1. Forecast of the final energy consumption for the base-case scenario.

It is assumed that in comparison with the year 2005 the major influence on energy consumption will be witnessed due to the increased electricity demand and the boost of energy consumption in transport sector – from 74 to 86 % of the overall increment in energy consumption depending on the selected scenario. The least influence is observed for heat and fuel demand by the sectors of construction, agriculture and fishery as well as households accounting for 4 to 8 % of the overall increase in energy consumption as per selected scenario.

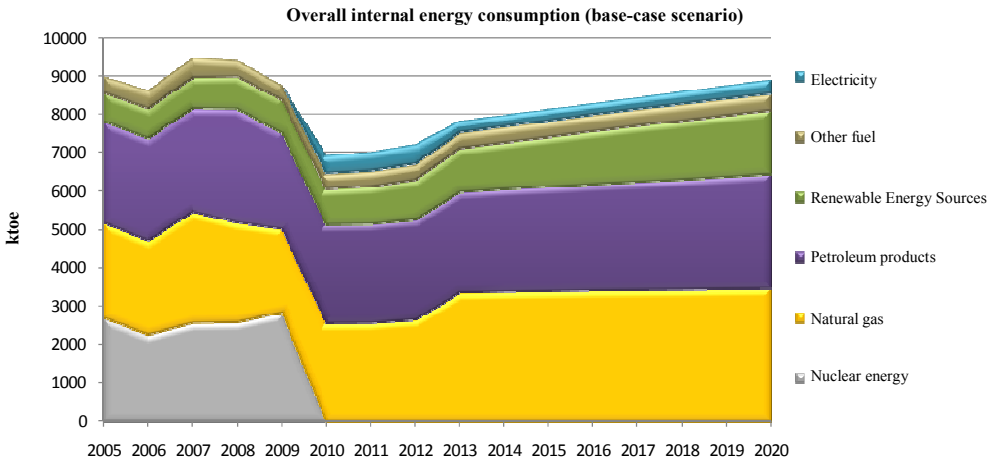

Figure 2. The gross inland energy consumption in the base-case scenario.

For the base-case scenario concerning the balance of the gross inland energy consumption in 2020, natural gas will make 39 %, oil products – 33 % and RES – 19 % (24 % in the overall final energy consumption).

2. Assessment of energy-saving potential and opportunities to use it

Assessment of energy-saving potential in the separate sectors of end-use energy, energy production and transport is carried out in the Study.

It is identified in the Study that the largest end-use energy-saving potential is in transport sector (44 % of the whole end-use energy-saving potential for the low promotion[1] and 41 % for the high promotion[2] scenarios). In the industry – 27 % and 20 % respectively, households – 15 % and 24 %, services – 14 %. In case of low promotion electricity and fuel make respectively 26 % and 74 % of the overall end-use energy-saving potential. In case of the high promotion figures are 20 % for electricity and 80 % for fuel.

Overall technical potential of efficiency increase in heat production is around 1.1 TWh fuel/year. Biofuel compounds 20 % of this potential. Thus the total converted technical fuel reduction potential which would cause the decrease in GHG emissions will be less. The same condition is valid for the evaluation of the heat losses in the heat supply network. The economically feasible energy-saving potential in the heat supply sector may be around 200 GWh/year and reach up to 12 %.

[1] Part of the technical potential which is achieved by implementing energy efficiency increasing measures, having satisfactory financial performance in the view of individual market players. Promotion of the lesser intensity, addressed to the obstacle removal and market players' awareness rising is needed to realize this potential.

[2] Part of the technical potential which is economically acceptable in the scope of the whole country. This potential can be used by implementing the policy of intense energy efficiency rising, taking into account the use of economical promotion measures (financial support for the projects or rise of the prices on energy).

It is likely that the relative electricity consumption in transport and supply sector will decrease in the future (technical potential is about 0.3–0.4 TWh/year), however due to the faster growth of electricity demand overall consumption will inevitably increase.

3. GHG emissions and forecast until the year 2020

GHG emissions in fuel combustion sector have been computed based on the developed fuel demand forecasts and forecasts for other sectors (waste, industrial processes and agriculture) have been specified.

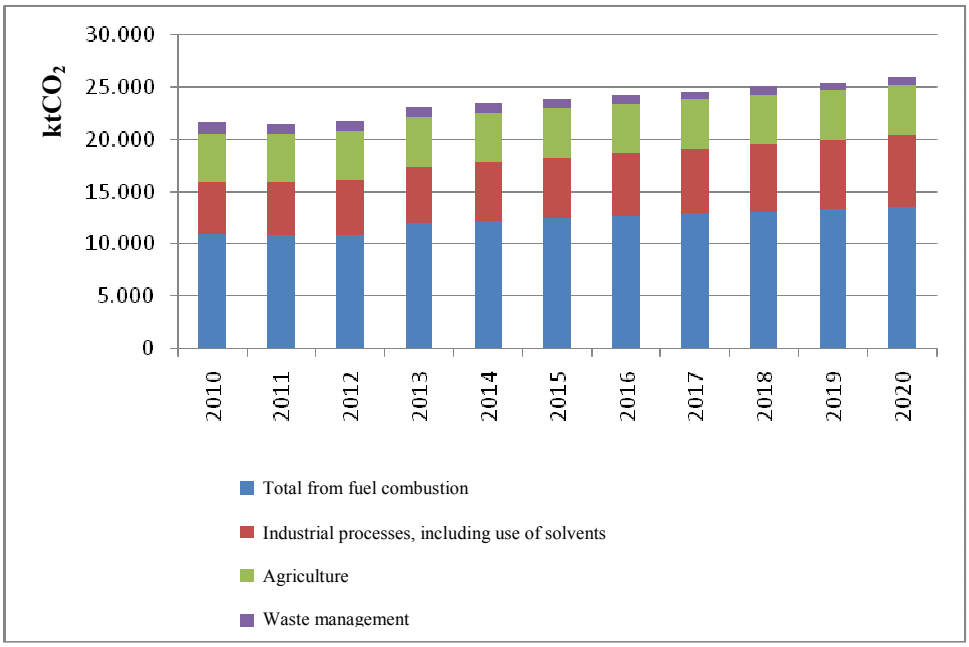

Figure 3. Forecasts of GHG emission quantities for base-case scenario

It should be noted that the assumptions relied on the assessment, i.e. a share of electricity import, a share of RES in the balance of electricity and DH production, and GDP variations have a significant influence on the GHG forecasts. For instance, assumptions for electricity import may influence the forecast of the GHG quantities in energy sector even as much as 3000 $ktCO_2$/year.
Impact of land-use, land-use change and forestry (thereinafter – LULUCF) methodology on forecasted GHG emissions is not assessed in the Study. One of the main reasons is that still there are too many unknowns, so it is not feasible to assess the impact of change in the methodology for Lithuania. It should be noted that costs for achieving GHG emission reduction targets depend on the methodology applied, but it is unlikely, that countries which do not have many forests would let other countries such as Lithuania have high profit with no additional effort.
A further situation in ETS and Non-ETS sectors is discussed.

3.1 ETS sector

Sectors involved in EU ETS: fuel combustion installations with a total thermal input exceeding 20 MW, industrial processes (main processes – oil refineries, cement, lime, ceramic products, glass, mineral wool and other branches of industry). New sectors such as aviation, ammonia and nitric acid production will be included in ETS from the year 2013.

ETS is divided into three periods: 2005–2007, 2008–2012, and 2013–2020. The third period of the EU emission trading will commence on 1 January 2013 and it will differ from the previous ones primarily due to its longer duration – it will last for 8 years (till 2020). In comparison with the former and present ETS trading period it is anticipated that during the coming period more EU allowances will be traded at auctions instead of allocating them free of charge. Free allowances will be allocated to Member States during 2013–2020, however, a share of these will tend to reduce every year along with a respective increase in a number of the auctioned EU allowances. The EU ETS system will become more stringent as a result of stricter rules imposed on the obtainment of free allowances. The principles of free allowance allocation can be found in Annex 5 of the Study.

Two provisions applicable to Lithuania are included in Directive 2009/29/EC:

–in regard to the obtainment of additional EU allowances for auctioning from a reserve intended for the new market entrants in the period from 2013 to 2015;

–allocation of free allowances for power plants during 2013–2019. There will be no free allocation of EU allowances for electricity production, so in the event Lithuania applies a provision concerning the allocation of free EU allowances for power plants, it would be able to qualify for up to 7.1 million EU allowances during the period of 2013-2020 with LTL 734 million savings achieved by the Lithuanian companies (at a price of 30€ per EU allowance) (for details see section 7.2).

A transition of target from 20 % to 30 % GHG reduction will be achieved by decreasing a number of free EU allowances or limited number of the auctioned allowances. The rise in the EU allowances price is forecasted as a result of the decreased supply of the EU allowances. The majority of the Lithuanian companies participating in ETS will be affected by this since even in the event of the 20 % target the objectives of the companies are considered ambitious and it will further lead to the shortage of the EU allowances at the ETS sector companies.

While assessing the transition from 20 % to 30 % in GHG emissions reduction the demand of EU allowances for the sectors is calculated. The amounts of EU allowances are the same for both targets. The forecasted demand of the EU allowances during the period of 2013–2020 is up to 84.4 million in the base-case scenario. It should be noted that amounts of allowances were calculated considering that targets of RES in the end-use energy balance, energy use efficiency increasing, modernisation of multi-flat apartment buildings, etc. will be accom-

plished. The used assumptions are described in detail in the Annex 1 of the Study. If the targets are not achieved, the need of allowances will rise.

While evaluating DH sector by the 20 % GHG emissions reduction methodology, preliminary allocation of free allowances is established. There is a lack of information about the decreasing proportion of free allocated allowances targeting 30 % emission reduction, so a chart is provided, where modelling results for free allowance allocation, changing form 10 % to 100 % at different forecasted prices for allowance, are plotted (see section 7.3). Assessing the need of allowances for DH sector, rapid development of RES, impact of modernisation of buildings, efficiency increasing in production and transportation are projected. According to the fact that targets and measures are sufficiently ambitious, complimentary measures are not evaluated as they are not so beneficial.

Assessing the costs in electricity sector it is assumed that Lithuania will not get provision of free allowances for electricity production and whole amounts of allowances will be purchased. The costs of pursuing 30 % GHG emission reduction in the electricity sector will be caused by increase in price of the allowances. Construction of new nuclear power plant, CHP implementation and biogas power plants installation in agriculture are assessed as supplementary GHG emission reduction measures. Increased use of RES is unlikely because the current set RES targets are sufficiently ambitious.

Assessing the costs in industry sector it is assumed that the free allowance allocation stays unchanged for the 30 % GHG reduction target in respect of 20 % target. Industrial companies will experience additional costs because of the rise of the prices for allocations. Additional measures of the GHG emission mitigation in the industrial sector are not foreseen, since the survey of industrial companies shows that such measures are already being implemented (i.e. transition to dry process of cement production) and there is no potential for other measures left.

In ETS sector additional expenditures due to transition from 20 to 30 % GHG reduction make up to LTL 2136 million or LTL 267 million per annum.

The following should be aimed at provided moving from 20 to 30 % GHG reduction target is intended:

- Lithuania should retain a possibility of obtaining free EU allowances for electricity production;
- It should be possible to cover the largest share of ETS by the carbon credits from the projects carried out outside the EU. It would lead to the increased supply and the reduced price of allowance;
- More limitations would be imposed on the sectors where the funds derived from the auctioned allowances could be directed by the state, i.e. electricity sector;

- The cases of the state support to private companies would be discussed.

3.2 Non-ETS sector

Sectors that are not involved in EU ETS: transport, waste management and agriculture, construction (only buildings that are not connected to the DH systems operated by the ETS installations). Electricity supplied by the electricity grids and consumed within the buildings is referred to EU ETS.

The task faced by Lithuania to reduce GHG emissions by 30 % would cause the increase of the emitted GHG amounts by 5 % if compared with the year 2005. In the event of 20 % GHG reduction target the increase would be 15 % if compared with the year 2005.

The prognosis of the GHG emissions till 2020 is based on the cost assessment of the non-ETS sector. The targets for the GHG emission reductions expressed in tonnes $CO_{2equiv.}$ are set if the chosen task is either 20 % or 30 %. The difference among these calculations shows the necessary additional reduction of the GHG emissions when moving the target from 20 % to 30 %. Transition to the target of 30 % for non-ETS sector in the year 2020 would mean the following respective reductions: up to 1.17 million $tCO_{2equiv.}$ in the base-case scenario, 0.34 million $tCO_{2equiv.}$ in the pessimistic and 1.28 million $tCO_{2equiv.}$ in the optimistic scenarios.

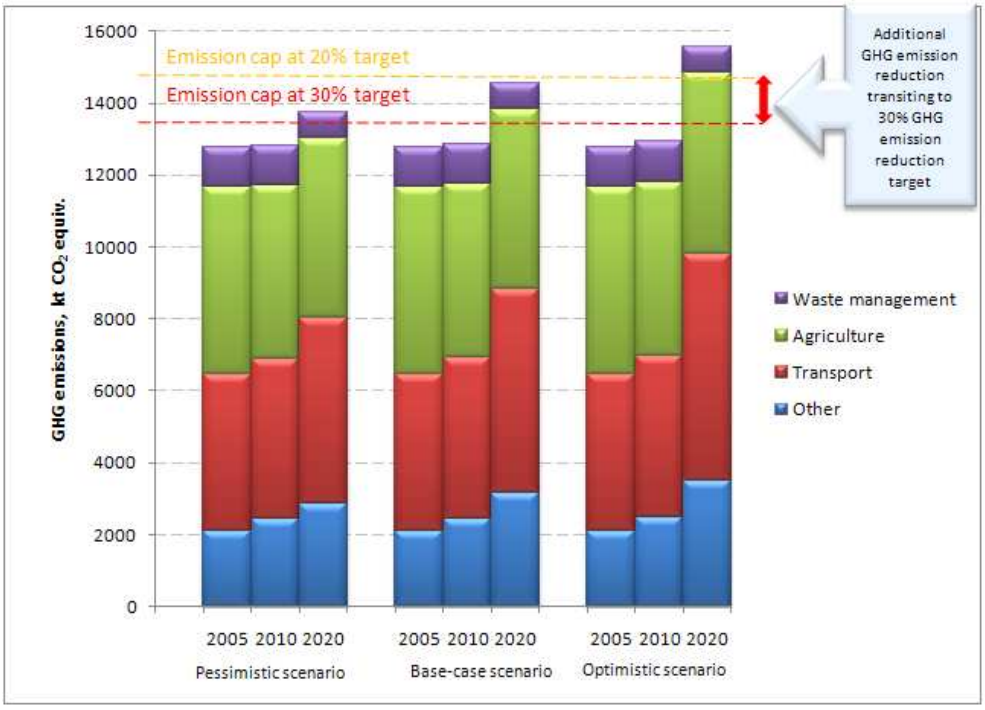

Figure 4. The prognosis and the targets of the GHG emissions

GHG reduction potential is sufficient for the achievement of the 30 % target. GHG reduction potential for agriculture is 0.7 million $tCO_{2equiv.,}$ 0.8 million $tCO_{2equiv.}$ for transport and 0.1 million $tCO_{2equiv.}$ for other sectors (i.e. house-

holds). There is a possibility for country to purchase the carbon credits from other countries in order to achieve the emission reduction target. At the moment there is a limit of 3 % for countries for the usage of the carbon credits, but it is likely that the limit could be increased if the transition to the target of 30 % occurred.

Additional GHG reduction potential in the sector of waste management is not prospective, because the impact of the measures implemented in the sector of waste management is reckoned in the target of 20 %. Construction sector has a significant potential in energy savings, unfortunately the most of the energy consumption is attributed to the ETS sector. However, additional measures in the construction sector would not have a substantial impact in the GHG emissions.

The modelling of the non-ETS sector costs was carried out on condition that potential of the distinct sectors are implemented at different stages. The scenarios assessed:
- the target is reached by purchasing the carbon credits from other countries for 30€ per unit (the scenario is not likely due to the limit on the usage of carbon credits);
- the potential in the transport sector is fully used and the rest is covered by purchasing carbon credits from other countries;
- the part of the potentials in the transport and agriculture sectors is used and the rest is covered by purchasing carbon credits from other countries;
- the part of the potentials in the transport and agriculture sectors is used; no carbon credits are purchased.
In the base-case scenario, on the condition that the measures are implemented using the part of the potentials in the transport and agriculture sectors and the rest is covered by the purchased carbon credits (30€ per unit), the transition to the target of 30 % costs would make up to LTL 229 million.

The following is proposed in case of transition from 20 to 30 % GHG emission reduction target is intended:

- It should be aimed that the largest share of the target is covered by the GHG reduction credits from the projects carried out outside the EU.

- That the EU level CO_2 tax would not be introduced because it would minimise a possibility to choose between different measures/means and sectors. i.e. EU level CO_2 tax might be applicable for the sectors of transport and agriculture while a single sector that is fully used should be sufficient for the commitment discharge.

- In order the existing energy savings potential in transport sector is duly employed, more attention and funds should be directed to the implementation of the sector-related energy efficiency measures.

Total costs of the transition from 20 % to 30 % of GHG reduction target in the base-case scenario during 2013–2020 would make up to LTL 2 365 million.