IDENTIFICATION OF MEASURES APPLICABLE FOR REDUCTION OF GHG EMISSIONS IN LITHUANIA

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Overview

The greenhouse gas (GHG) emissions in Lithuania are relatively low, but the country's contribution is essential for the implementation of international climate change agreements. This paper aims to identify measures applicable for reduction of GHG emissions in Lithuania and its impact. The classification of policies and measures (PaMs) of climate change mitigation according to the selected criteria are presented in this paper. The main classification criteria of measures: PaMs according to the coverage; PaMs according to the relation with the EU-level documents package; PaMs according to the relation with economic sectors; PaMs according to the influence on certain GHG emissions or their groups; PaMs according to the relation with the energy union dimension; PaMs according to the economic sector and target; PaMs according to the nature and instrument used; PaMs according to the relation with the EU climate change and energy policy; PaMs according to the level of the institution; PaMs according to the status of implementation. A detailed classification of PaMs according to each criteria are presented and the relevance of such a classification for the preparation of GHG projections are discussed.

Method

Detailed analysis of the climate change mitigation measures and their impact asessment requirements was caried out according to the different clasification criteria. Such clasification of PaMs is very important for GHG emission projections scenarios preparation and for various measures impact evaluation. In order to assess impacts of various PaMs it is necessary to apply an integrated approach and modern tool. For this purpose the mathematical model based on MESSAGE software was used to analyse the perspective development of energy sector, GHG emissions and impact of PaMs.

Results

In the context of the preparation of GHG emissions projections, PaMs should be understood as defined in Regulation (EC) No. 525/2013: "policies and measures" means all instruments which aim to implement commitments under Article 4(2)(a) and (b) of the United Nations Framework Convention on Climate Change, which may include those that do not have the limitation and reduction of GHG emissions as a primary objective. The measures must meet the following criteria:

- lead in modifying longer-term trends in anthropogenic emissions;
- correspond the economic structures and resource bases, available technologies and other circumstances of the country;
- maintain strong and sustainable economic growth;
- measures can be implemented jointly with other countries;
- measures may assist in contributing to the achievement of the objective of the Convention.

It should be noted that definition of the PaMs set out in Regulation (EU) No 525/2013 is valid for the period up to 2020. In 30 November 2016 EC in the proposal No 2016/0375 for a Regulation of the European Parliament and of the Council on the Governance of the Energy Union clarified the definition of PaMs for the period 2021-2030: "policies and measures" means all instruments which contribute to meeting the objectives of the integrated national energy and climate plans and/or to implement commitments under Article 4(2)(a) and (b) of the UNFCCC, which may include those that do not have the limitation and reduction of greenhouse gas emissions or change in the energy system as a primary objective. Thus, in order to mitigate the climate change through the reduction or limitation of GHG emissions, country can implement different PaMs if they meet the criteria identified in the definition of policies and measures, as well as other criteria.

The classification of PaMs according to the coverage into separate PaM or PaMs group becomes relevant due to availability of information on these measures and their impact for the preparation of detailed projections of GHG emissions. If it is possible, it is necessary to prepare GHG emission projections by assessing the impact of separate PaM. If due to the lack of information it is not possible to prepare forecasts of GHG emissions for the separate PaM included in the PaMs group when it is appropriate to prepare GHG emission projections for the PaMs group. The PaMs group is understood as a set of separate and separate measures applied in one sector and having a common goal.

PaMs according to the relation with the EU-level documents package can be divided into PaMs which have an impact on the GHG emissions reduction for the installations involved in the EU emission trading system (EU ETS), and PaMs affecting the GHG emissions reduction in other sectors (non-EU ETS).

GHG emission projections should be prepared for economic sectors that are included in national GHG inventories in accordance with the requirements of the UNFCCC and EU legislation. It is necessary to identify GHG or group of GHG emissions which can be influenced due to application of relevant PaMs. For example, the National Climate Change Action Plan can affect all GHG emissions or their groups, and therefore it is necessary to assess the overall reduction of GHG or their groups due to the application of PaM.

Taking into account requirements defined in the Proposal (No 2016/0375) for a regulation of the European Parliament and of the Council on the Governance of the Energy Union it is expedient to classify the PaMs according to the relation with the energy union dimension.

The classification of PaMs by nature and instrument used allow to identify the most effective measures, e.g. measures which contributes significantly for GHG emissions reduction.

GHG emissions projections should be prepared in such a way that allow evaluation of actions taken and contributions made by public authorities and municipalities for the implementation of various PaMs. The amount of GHG emissions can be reduced or be limited due to the actions taken by the Government, regional authorities, municipalities, enterprises or research institute therefore such classification of PaMs let to assess at which institutional level implemented PaM can reduce GHG in the most effective way.

The classification of PaMs according to the status of implementation is important because the GHG emission projections scenarios should be based on this classification. In order to implement requirements of European Regulation No 525/2013 countries have to submit three scenarios on GHG emissions:

- projections with existing measures WEM (policies and measures that have been adopted and implemented);
- projections with additional measures WAM (policies and measures which have been adopted and implemented to mitigate climate change as well as policies and measures which are planned for that purpose);
- projections without measures WOM (exclude the effects of all policies and measures which are planned, adopted or implemented after the year chosen as the starting point for the relevant projection).

Seeking to evaluate impact of various PaMs on GHG emission reduction, first of all, it is expedient to prepare GHG emission scenario "with existing measures" – WEM scenario. Projections of GHG emissions according to the scenario "without measures" (WOM scenario) can be estimated based on scenario "with existing measures" plus forecasted increase of GHG emissions in the case if selected PaMs would be not adopted and not implemented. This forecasted increase of GHG emissions can be defined as avoided GHG emissions due to adopted and implemented PaMs. Consequently, the amount of GHG emissions according to the scenario "without measures" can be calculated by the following expression:

$$GHG_{WOM,t} = GHG_{WEM,t} + \sum_{i=1}^{n} \Delta GHG_{i,t} \qquad (1)$$

where $GHG_{WOM,t}$ is the amount of GHG emissions according to the scenario "without measures" at time t; $GHG_{WEM,t}$ is the amount of GHG emissions according to the scenario "with existing measures" at time t; n is number of PaMs; $\Delta GHG_{i,t}$ is forecasted impact of measure i on GHG emissions reduction at time t.

The amount of GHG emissions according to the scenario "with additional measures" (WAM scenario) can be evaluated based on the amount of GHG emissions according to the WEM scenario and forecasted impact of additional measures by following expression:

$$GHG_{WAM,t} = GHG_{WEM,t} - \sum_{i=1}^{m} \Delta GHG_{j,t} \qquad (2)$$

where $GHG_{WAM,t}$ is the amount of GHG emissions according to the scenario "with additional measures" at time t; $GHG_{WEM,t}$ is the amount of GHG emissions according to the scenario "with existing measures" at time t; m – number of additional PaMs; $\Delta GHG_{j,t}$ is forecasted impact of additional measure j on GHG emissions reduction at time t.

A GHG emissions forecasting and PaMs impact assessment requires an integrated approach and modern tools used for modelling developments of all branches of economy and assessing emissions.

Conclusions

The classification of PaMs is important for the GHG emission projections scenarios preparation and for PaMs impact evaluation.

Seeking to forecast GHG emissions in energy sector it is recommended to apply methodology which is based on the optimization of the perspective development of energy sector considering to the environmental aspects. Comprehensive mathematical models, adopted MESSAGE software, can be used to analyse the perspective development of energy sector and environmental consequences. In general, many of factors can only be evaluated in a complex modelling of energy sector development trends in the long run together with the analysis of the links between energy and the economy.

References

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