

**FURTHER WRITTEN SUBMISSION FROM LITHUANIA**



**LIETUVOS RESPUBLIKOS AMBASADA VOKIETIJOS FEDERACINĖJE  
RESPUBLIKOJE**

**BOTSCHAFT DER REPUBLIK LITAUEN IN DER BUNDESREPUBLIK  
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**LITHUANIAN FURTHER WRITTEN SUBMISSION**

With reference to the Compliance Committee's letter of 22 November 2011, please, find enclosed the electronic version of the Lithuanian further written submission in Word format.

Enclosed. The Lithuanian further written submission, 38 pages.

Yours sincerely,

Mindaugas Butkus  
Ambassador

**FURTHER WRITTEN SUBMISSION FROM LITHUANIA**  
**Under Section X, paragraph 1(e) of the Procedures and mechanisms relating to**  
**compliance under the Kyoto Protocol (Decision 27/CMP.1)**

**In response to the Preliminary Finding of the Enforcement branch of the Compliance**  
**Committee**  
**(CC-2011-3-6/Lithuania/EB)**

**16 December 2011**

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## I. Summary

1. In response to the preliminary finding of the Enforcement Branch of the Compliance Committee (the “**EB**”) (reference CC-2011-3-6/Lithuania/EB of 17 November 2011) (the “**preliminary finding**”) we are pleased to submit the following further written submission on behalf of the Government of Lithuania in accordance with paragraph 1(e) section X of the Procedures and mechanisms relating to compliance under the Kyoto Protocol (Decision 27/CMP.1) and Rule 17 of the Rules and Procedure. This submission sets out Lithuania's position with respect to the preliminary finding and requests that the EB should:
  - (a) not proceed with any of the questions of implementation raised in the 'Report of the individual review of the annual submission of Lithuania submitted in 2010', dated 7 September 2011 (FCCC/ARR/2010/LTU) (the “**2010 ARR**”); and
  - (b) not declare Lithuania to be in non-compliance in accordance with section XV of the Annex to decision 27/CMP.1, or to suspend Lithuania's eligibility to participate in the mechanisms in accordance with the relevant provisions under Articles 6, 12 and 17 of the Kyoto Protocol.
2. Further, the Government of Lithuania requests that the EB should:
  - (a) defer any final decision until the draft report from the in-country review undertaken by the ERT between 26 September 2011 and 1 October 2011 (the “**in-country review**”) of the inventory submitted by Lithuania in 2011 (the “**2011 Inventory Submission**”) is available as permitted under paragraph 11, section IX, of the Annex to decision 27/CMP.1; or
  - (b) taking into account its national conditions and specific circumstances, refer any question of implementation that the EB considers to remain with respect to Lithuania to the Facilitative Branch for consideration under paragraph 12, section IX, Annex to Decision 27/CMP.1 with the view to the Facilitative Branch providing Lithuania with advice and assistance relating to its KP-LULUCF reporting and information obligations. The EB is requested to take note of the ERT's comments made after the in-country review which show that Lithuania has put in place all of the mandatory elements for a national system and therefore, there are no impediments to a referral under paragraph 12, section IX, Annex to Decision 27/CMP.1.

## II. Background

3. The EB held its sixteenth meeting in Bonn, Germany between 14 - 17 November 2011 to consider the questions of implementation raised in relation to Lithuania's non-compliance with the Guidelines for national systems for the estimation of anthropogenic greenhouse gas emissions by sources and

removals by sinks under Article 5, paragraph 1, of the Kyoto Protocol (annex to decision 19/CMP.1) and the Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol (annex to decision 15/CMP.1).

4. On 15 November 2011, Lithuania presented its case based on its written submission (reference CC-2011-3-5/Lithuania/EB of 9 November 2011) (the "**written submission**") during a hearing in front of the EB and submitted the following additional documents:
  - (a) preliminary conclusions of the ERT's in-country review; and
  - (b) documents, which elaborated on the following key measures which have been instrumental in improving Lithuania's national GHG inventory system:
    - (i) overhauling the legal infrastructure and ministerial functions;
    - (ii) streamlining the GHG inventory procedures;
    - (iii) defining the roles and responsibilities of the key institutions and the Commission for the Preparation of a National Inventory Submission;
    - (iv) making arrangements to improve the technical competence and sectoral expert knowledge of staff involved in the national GHG inventory development and review process; and
  - (c) responses to the Saturday paper, issued on 1 October 2011 (reference CC-2011-3-5/Lithuania/EB/Add.1) containing information on the measures to improve Lithuania's national GHG inventory system in the following areas:
    - (i) improving its national system since the ERT's centralised review in 2010, resulting in a formalised Action Plan to improve KP-LULUCF reporting;
    - (ii) GHG inventory archive improvement plan.

All such measures are currently under implementation.

5. During the hearing, the EB received advice from experts on their views of the ERT's findings regarding Lithuania's national system, the questions of implementation raised by the EB and the measures undertaken by Lithuania in response to the issues highlighted by the ERT during their centralised review in September 2010.

### **III. Further Submissions**

6. Lithuania submits that the country's national system is now in compliance with all of the mandatory elements for a national system under Article 5, paragraph

1 of the Kyoto Protocol and the Guidelines for national systems. In response to the EB's concerns regarding the status of the implementation of the measures to improve Lithuania's national systems, Lithuania's efforts to overhaul the national system have been underway well in advance of the ERT's in-country review for the 2011 Inventory Submission, when the ERT was particularly complimentary about Lithuania's efforts to improve the national system (see Annex 14 of the written submission). As further evidence of the effectiveness of the redesigned national system, in order to produce and submit timely Inventory Submissions, the:

- (a) State Forest Service experts produced the LULUCF and KP-LULUCF estimates by 15 April 2011; and
  - (b) the Environmental Protection Agency and the experts from the Commission for the Preparation of a National Inventory Submission:
    - (i) provided comments on the draft 2010 ARR on 28 July 2011;
    - (ii) recalculated the GHG estimates submitted on 23 September 2011;
    - (iii) resubmitted the national Inventory Report on 4 November 2011;
    - (iv) provided additional information to the ERT during the in-country review; and
    - (v) made a significant contribution to producing Lithuania's response to the 2011 Saturday paper submitted on 14 November 2011.
7. Lithuania draws attention that ERT 2011 has reviewed Lithuania's reply to the list of potential problems and unresolved issues raised as the result of the in-country review of the 2011 inventory submission and considered that all the issues are resolved. The Response of ERT to the Lithuania's answers to the report was issued on 14 December, 2011 and is presented in **Annex 1** of this further written submission. Based on this additional information provided in Lithuania's response to the Saturday paper, the ERT will proceed with preparation of the draft annual review report to be issued in January 2012.

8. Lithuania notes that paragraph 19(a) and (b) of the preliminary finding state:

*“(a) As long as the implementation of these measures is pending, the national system is not operating in accordance with the guidelines for national systems; (b) The redesigned national system is yet to perform all specific functions relating to inventory planning, preparation and management to generate an annual inventory”.*

Lithuania respectfully submits that tangible improvements resulting from Lithuania's redesigned national system, the measures for which were primarily

implemented after the ERT's centralised review of Lithuania's 2010 Inventory Submission, will be more fully visible in the final report of the in-country review of Lithuania's 2011 Inventory Submission.

We are confident that the report will highlight the number of improvements which have been implemented since the 2010 ARR and demonstrate that the redesigned national system is performing the specific functions relating to inventory planning, preparation and management. We believe that a positive review by the ERT of Lithuania's 2011 Inventory Submission provides strong evidence to support Lithuania's ability to have in place a national system in accordance with Article 5, paragraph 1, of the Kyoto Protocol and the Article 7 requirements and guidelines decided thereunder.

9. Lithuania respectfully notes that the ERT issued the draft 2010 ARR on 3 June 2011 and the final report on 7 September 2011, which constitutes a 6 month delay, contravening the one year timeline as provided for in paragraph 72 of the annex to the decision 22/CMP.1, "Guidelines for review under Article 8 of the Kyoto Protocol". The ERT's delay in producing the 2010 ARR in turn had a knock-on effect on Lithuania's ability to prepare timely responses to the 2010 ARR, as internal resources had already been allocated to preparing for the ERT's in-country review. We submit that if the 2010 ARR had been delivered on time, it would have enabled Lithuania to implement the necessary measures to address the questions of implementation well in advance. The delay caused by the ERT should not be allowed by the EB to trigger an adverse effect on the Government of Lithuania's ability to satisfy or avoid any questions of implementation. At the very least the EB should recognise this and treat it as a mitigating factor.
10. During the hearing, the EB raised concerns that additional staff required in the key institutions responsible for inventory planning, preparation and management were yet to be appointed. Lithuania would like to clarify that although additional staff will ensure that the compilation of the national inventory will be more efficient, the key experts within the responsible national institutions for the preparation of a national inventory, in both the new and old national systems, are largely to remain the same; amendments have only been made to their legally defined functions, responsibilities and enhanced institutional and expert capacities. The list of the key institutions and names of the experts are set out in Annexes 3 and 4 of the written submission.

Lithuania's key experts were intrinsically involved in assisting the ERT during the in-country review and instrumental in resubmitting the 2011 Inventory Submission and preparing the response to the 2011 Saturday paper. The ERT has experienced firsthand the capabilities of Lithuania's experts during the in-country review and given their positive feedback after the review, we believe this is yet further evidence of the efficient operation of the ministries and institutions which comprise Lithuania's national system. The key individuals which facilitate the comprehensive, transparent and complete preparation and resubmission of Lithuania's 2011 annual inventory and participated in the in-country review are set out in **Annex 2** of this further written submission.

Therefore, Lithuania submits that the EB is not correct in its notations at paragraph 19 (a) and (b) of its preliminary finding.

#### **IV. Analysis of Factual Statements**

11. With respect to paragraph 16 of the preliminary finding:

*“[Lithuania] explained that the legal and institutional arrangements relating to its redesigned national system had been in operation since July 2011...”*

Lithuania respectfully submits that, in accordance with the written submission (see Chapter 2 and Annex 1), the overhaul of the national system began in early 2010 and proceeded to evolve during the course of 2011. We therefore believe that the redesigned national system has, in effect, been in operation from 2011. In light of the fact that the institutions required to deliver the information under the Kyoto Protocol in order to produce the Inventory Submission did so in an accurate manner and within the required timeframe (see section 6 above), this shows that Lithuania's national system was running efficiently during 2011. We submit that the EB should take this into consideration when producing the final decision and should also amend the preliminary decision accordingly.

12. Paragraph 19(c) of the preliminary finding states:

*“(c) Earlier expert review teams had consistently indicated a need for substantial improvements in the national system of Lithuania in the reports of the review of the initial report of Lithuania, the individual review of the greenhouse gas inventories of Lithuania submitted in 2007 and 2008 and the individual review of the annual submission of 2009.”*

Lithuania submits that the ERT's recommended improvements were acknowledged and acted upon, (see the ARR 2008, ARR 2009 and ARR 2010 which noted progress made (see paragraphs 11, 19, 27, 28, 39, 51, 55, 70, 78, 84, 86, 92, 94, 96, 103, 106, 108, 120, 194 of the ARR 2010; paragraphs 5, 33, 56, 59, 85, 116, 135 of the ARR 2009 and paragraphs 9, 13, 18, 47, 57, 65 of the ARR 2008) and the 2011 ERT's preliminary conclusions from the in-country review state that Lithuania has made significant improvements to its national system (see Annex 14 of the written submission). See **Annex 3** of this further written submission for a detailed list of the improvements suggested by the ERT in the ARR 2009 and ARR 2010 and Lithuania's response and reaction to each proposal. Lithuania argues, that in accordance with its national circumstances, it was continuously improving its GHG inventory following the principles set out by the IPCC GPG:

*“Good practice guidance further supports the development of inventories that are transparent, documented, consistent over time, complete, comparable, assessed for uncertainties, subject to quality control and assurance, efficient in the use of the resources available to inventory agencies, and in which uncertainties are gradually reduced as better information becomes available.”*



13. With reference to paragraph 20 of the preliminary finding:

*“20. The enforcement branch concludes, based on the information submitted and presented, that the unresolved problems referred to in paragraphs 12 to 14 above resulted in non-compliance with the guidelines for national systems at the time of the finalization of the 2010 ARR.”*

Lithuania concurs that, at the time of the centralised review of Lithuania's 2010 Inventory Submission, Lithuania did have difficulties in complying with the guidelines for reporting on KP-LULUCF activities. We refer to you Annex 15 of the written submission which sets out the Action Plan to improve KP-LULUCF reporting, with the aim of providing evidence for and assurance of our commitment and dedication to improving current and future KP-LULUCF reporting. As further evidence, we refer you to **Annex 4** of this further written submission, which sets out measures which have already been implemented in accordance with the Action Plan to improve KP-LULUCF reporting.

14. With regard to paragraph 21(a) of the preliminary finding:

*“21. While Lithuania has submitted and presented information on positive steps it has undertaken before and after the finalization of the 2010 ARR to address the unresolved problems referred to in paragraphs 12 to 14 above, this information has not enabled the enforcement branch to conclude that the question of implementation has been resolved. The enforcement branch concludes that: (a) Lithuania needs to make further progress in the implementation of the measures referred to in paragraph 19 above to ensure that the national system performs all the general and specific functions described in the guidelines for national systems;”*

Following the questions of implementation raised after the 2010 ARR, Lithuania is fully committed to progressing the development of our national system and to resolving the issues relating to timely submission of KP-LULUCF information. The corresponding plans in Annexes 9, 11, 12 and 15 of the written submission are intended to overcome the issues addressed in paragraphs 12 to 14 of the preliminary decision and convey sufficient willingness, action and allocation of resources by the Government of Lithuania to comply with its obligations under the Guidelines for national systems for the estimation of anthropogenic greenhouse gas emissions by sources and removals by sinks under Article 5, paragraph 1 of the Kyoto Protocol and the Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol.

15. Paragraph 21(b) of the preliminary finding states:

*“(b) An in-country review of Lithuania's redesigned national system, in conjunction with a review of an annual inventory report that is generated by this system and reflects substantial progress, in particular in the reporting on KP-LULUCF activities, is required for the enforcement branch to assess compliance with the guidelines for national systems.”*

Should the EB find Lithuania not to be compliant with its obligations under the Kyoto Protocol and the associated guidelines and, therefore, suspend Lithuania's eligibility to participate in the mechanisms, paragraph 21(b) implies that before Lithuania can apply for reinstatement, the EB will need to consider Lithuania's performance following the submission of a further annual inventory submission and an in-country review. Lithuania respectfully submits that any such reinstatement could, in theory, be prolonged until 2013 (when Lithuania's next in-country review is due to take place in 2012), during which time the suspension will have already had a detrimental economic, political and reputational impact on the Government of Lithuania. Lithuania therefore invites the EB to defer any anticipated suspension until after the draft report from the 2011 Inventory Submission in-country review has been published as this will provide the EB with confirmation of the ability of Lithuania's current national system to produce a transparent, consistent, comparable, complete and accurate Inventory Submission. Alternatively, the EB should remove the requirement of an in-country review and replace it with the receipt by the EB of sufficient evidence pursuant to paragraph 149 of Part VIII to Decision 22/CMP.1.

16. With reference to paragraph 22(b) of the preliminary finding:

*“As long as there are unresolved problems pertaining to language of a mandatory nature relating to Lithuania’s national system, it is not appropriate to consider referral of the question of implementation to the facilitative branch under paragraph 12 of section IX”*

Lithuania respectfully invites the EB to note the following:

- (a) Lithuania believes there are no unresolved problems pertaining to language of a mandatory nature relating to its national system. We acknowledge that there has been a historic issue with Lithuania's reporting obligations under Article 7 of the Kyoto Protocol particular to the KP-LULUCF sector and therefore Lithuania requests that the EB refer the question of implementation to the Facilitative Branch in accordance with the Facilitative Branch's mandate of “promoting compliance by Parties with their commitments under the Protocol”;
- (b) under paragraph 12 of section IX of the Decision 22/CMP.1, “Where appropriate, the enforcement branch may, at any time, refer a question of implementation to the facilitative branch for consideration”. This discretion does not appear to be limited anywhere (for example, by the alleged existence of language of a mandatory nature relating to Lithuania's national system) and any measure of appropriateness or suitability is therefore entirely a limitation of the EB's own creation; and
- (c) Furthermore, “unresolved problems pertaining to language of a mandatory nature” is a precondition of the ERT listing a question of implementation with respect to a Party, in the absence of which the ERT must limit itself to noting the problem in its report, in accordance with paragraph 8 of the Decision 22/CMP.1. Paragraph 12 (above)

allows the EB to refer a "question of implementation" to the Facilitative Branch. If, pursuant to paragraph 8 of Decision 22/CMP.1, only problems pertaining to language of a mandatory nature are used to form the basis of a question of implementation, then logically paragraph 12 of section IX can only ever refer to problems being referred to the Facilitative Branch that pertain to language of a mandatory nature. Given the above, there is nothing to preclude the EB from referring the matter to the Facilitative Branch.

17. Paragraph 24 of the preliminary finding states:

*“24. Lithuania shall develop a plan referred to in paragraph 1 of section XV, in accordance with the substantive requirements of paragraph 2 of section XV and paragraph 1 of rule 25 bis of the rules of procedure, and report on the progress of its implementation in accordance with paragraph 3 of section XV. Taking into account the measures and timetables for their implementation referred to in paragraph 19 above, Lithuania shall submit this plan within six months to the enforcement branch in accordance with paragraph 2 of section XV and may wish to consider:*

- i. With respect to subparagraphs 2 (b) and (c) of section XV, to consolidate these measures and timetables, including any updates it considers appropriate;*
- ii. To submit, together with the plan referred to in paragraph 1 of section XV, a progress report on the implementation of this plan in accordance with paragraph 3 of section XV;”.*

Should the EB nonetheless find Lithuania to be not in compliance, Lithuania will produce and submit the requested plan by 16 May 2012 and will also produce progress reports on the implementation of this plan and on other improvements relating to the questions of implementation. Pursuant to this requirement, and as part of Lithuania's commitment to building on the progress made in relation to improve KP-LULUCF reporting, please see **Annex 4** of this further written submission, which sets out measures which have already been implemented according to the Action Plan to improve LULUCF reporting.

## **V. Conclusions**

18. Lithuania strongly believes that a combination of the measures set out in the written submission and this further written submission currently evidences that Lithuania's national system comply with the requirements under Article 5, paragraph 1 set out in the guidelines for national systems and the Article 7 guidelines. In recognition of the ERT's recommendation to continually strive to improve the general and specific functions relating to inventory planning, preparation and management, the Government of Lithuania has formulated a number of plans, referenced in sections 13 and 14 above, and will also submit the plan as requested by the EB in paragraph 24(b) of the preliminary finding.

19. The EB is requested to reconsider its preliminary finding with respect to the suspension of Lithuania and to adopt the decision not to proceed with the questions of implementation as referred to in paragraphs 12 to 14 of the preliminary finding or, in the alternative modify the preliminary finding in light of the clarifications raised in this further written submission.
20. Lithuania invites the EB to defer the final decision until the draft report from the ERT's in-country review is available in January 2012, as permitted under paragraph 11, section IX, of the Annex to decision 27/CMP.1.
21. Should the EB consider that any questions of implementation remain with respect to Lithuania, we request that, taking into account its national conditions and specific circumstances, you refer any question of implementation to the Facilitative Branch for consideration under paragraph 12, section IX, Annex to decision 27/CMP.1 with a view to the Facilitative Branch providing Lithuania with advice and assistance relating to its KP-LULUCF reporting and information obligations. The EB is requested to take note of the ERT's comments made after the in-country review on Lithuania's 2011 Inventory Submission (see Annex 14 of the written submission and **Annex 1** of the further written submission) that Lithuania has put in place all of the mandatory elements for a national system and therefore, there are no impediments to a referral under paragraph 12, section IX, Annex to Decision 27/CMP.1.

## ANNEX 1

**Lithuania's answers to the report**  
***“Potential Problems and Further Questions from the ERT  
formulated in the course of the 2011 review of the greenhouse gas  
inventories of Lithuania submitted in 2011”***

**Ministry of Environment**  
**11 November 2011, Vilnius**

**Response of the ERT to the Lithuania's answers to the report**

**14 December 2011**

**For the ERT,**

**Ms. Thelma Krug,  
Lead Reviewer**

**Ms. Suvi Monni,  
Lead Reviewer**

In response to the potential problems related to non-inventory elements of the annual submission under the Kyoto Protocol, Lithuania submits (attached as separate files):

1. Lithuania's GHG inventory archive improvement plan
2. Action plan to improve LULUCF reporting of Lithuania

As supplementary information to the "Action plan to improve LULUCF reporting", Lithuania submits the document "Surveying of carbon stock in Lithuanian forests".

Responding to the ERT findings on inventory-related potential problems, Lithuania is providing answers in Attachment A (pages 8-12) and in the attached file "*Energy recalculations\_2011.xls*" and resubmits 2011 greenhouse gas inventory. CRF tables have been uploaded to the UNFCCC submission portal on 4<sup>th</sup> November 2011. In addition, the list of the revisions of GHG estimates by sector is provided below:

Energy:

- 1.AA.1.A Public Electricity and Heat production/ Solid fuels/ Peat, CO<sub>2</sub>
- 1.AA.2.E Food processing, beverages and tobacco/ Solid fuels/ Peat, CO<sub>2</sub>
- 1.AA.1.C Manufacture of Solid Fuels and Other Energy Industries/ Solid fuels/ Peat, CO<sub>2</sub>
- 1.AA.2.F Other non-specified/ Solid fuels/ Peat, CO<sub>2</sub>
- 1.AA.4.A Commercial/Institutional/ Solid fuels/ Peat, CO<sub>2</sub>
- 1. AA.4.B Residential/ Solid fuels/ Peat, CO<sub>2</sub>
- 1.AA.4.C Agriculture/Forestry/Fisheries/ Solid fuels/ Peat, CO<sub>2</sub>
- 1.AB Fuel combustion - Reference approach/ Gaseous fuels/ Natural gas
- 1.AC Difference –Reference and sectoral approach/ Gaseous fuels
- 1.AD Feedstocks and non-energy use of fuels/ Natural gas

Industrial processes:

- 2.F.1 Refrigeration and air-conditioning equipment/ Transport refrigeration, HFC

Due to recalculation of GHG emissions, calculation of the commitment period reserve is also revised and provided below.

## **Revision of the calculation of the commitment period reserve**

As a result of the revision of estimations, total greenhouse gas emission in 2009 has changed, therefore calculation of the commitment period reserve is revised.

The commitment period reserve is calculated in accordance with decision 11/CMP.1 as 90% of assigned amount or 100% of its most recently reviewed inventory times five, whichever is lowest.

In the case of the Lithuania, the relevant size of the commitment period reserve is five times the 2009 inventory (submitted in November 2011), which is calculated below:

$$5 \times 20\,418,33 \text{ Gg CO}_2 \text{ eq} = \mathbf{102\,091\,669 \text{ tonnes CO}_2 \text{ eq.}}$$

### **Response of the ERT:**

**The ERT agrees with the new figure.**

## **Potential problems with non-inventory elements of the annual submission under the Kyoto Protocol**

With reference to the Guidelines for review under Article 8 of the Kyoto Protocol the ERT requests that additional information corresponding to the potential problems identified in this paper be forwarded to the ERT, through the UNFCCC secretariat, not later than by 14 November 2011.

### ***National System (1)***

#### Potential problem/question:

In accordance with paragraph 16 of the annex to decision 19/CMP.1 each Party included in Annex I, as part of its inventory management, shall:

- (a) Archive inventory information for each year in accordance with relevant decisions of the COP and/or COP/MOP. This information shall include all disaggregated emission factors, activity data, and documentation about how these factors and data have been generated and aggregated for the preparation of the inventory. This information shall also include internal documentation on QA/QC procedures, external and internal reviews, documentation on annual key sources and key source identification and planned inventory improvements;
- (b) Provide review teams under Article 8 with access to all archived information used by the Party to prepare the inventory, in accordance with relevant decisions of the COP and/or COP/MOP;
- (c) Respond to requests for clarifying inventory information resulting from the different stages of the review process of the inventory information, and information on the national system, in a timely manner in accordance with Article 8.

Paragraph 11 of the annex to decision 19/CMP.1, states that in order to meet the objectives and perform the general functions of the national system described above, each Party included in Annex I shall undertake specific functions relating to inventory planning, preparation and management.

In accordance with paragraph 51 of the UNFCCC reporting guidelines on annual inventories, Annex I Parties should gather and archive all relevant inventory information for each year, including all disaggregated emission factors, activity data and documentation on how these factors and data were generated, including expert judgment where appropriate, and how they have been aggregated for reporting in the inventory. This information should allow reconstruction of the inventory by the expert review teams, inter alia. Inventory information should be archived from the base year and should include corresponding data on the recalculations applied. The “paper trail”, which can include spreadsheets or databases used to compile inventory data, should enable estimates of emissions and removals to be traced back to the original disaggregated emission factors and activity data. Also, relevant supporting



documentation related to QA/QC implementation, uncertainty evaluation, or key source analyses should be kept on file.

The ERT notes that Lithuania has not addressed the recommendations contained in paragraphs 32 and 38 of the 2009 and 2010 annual review reports, respectively, and it has not been able to provide archived documents requested by the ERT during the review. During the in-country review the ERT visited the archive and noted that it does not include all the information required. The ERT concluded that the archive in its current form does not fulfill all the above-mentioned requirements contained in decision 19/CMP.1.

**Recommendation by the ERT:**

The ERT recommends that Lithuania develop, within 6 weeks, a comprehensive plan on how the archive will be improved by the next annual submission so that it conforms with the requirements related to the archived inventory information contained in the annex to decision 19/CMP.1.

The ERT recommends that the plan include the activities that will be implemented by Lithuania in order to ensure that the archive contains the following inventory information: disaggregated emission factors, activity data, and documentation about how these factors and data have been generated and aggregated for the preparation of the inventory; internal documentation on QA/QC procedures, external and internal reviews, documentation on annual key categories and key categories identification and planned inventory improvements. Lithuania must ensure that the review teams have access to all archived information used by Lithuania to prepare the inventory and that it is in position to respond to requests for clarifying inventory information resulting from the different stages of the review process of the inventory information, and information on the national system, in a timely manner in accordance with Article 8.

Furthermore, the ERT recommends that Lithuania put in place the archive in accordance with the above-mentioned decisions and report on the archive in its next annual submission.

**Response/ Information by Party**

Responding on the issue raised above and aiming to improve GHG inventory archive, Lithuania submits “Lithuania’s GHG inventory archive improvement plan” (attached as a separate file).

**Response of the ERT:**

The potential problem is resolved.

The ERT considered the “Lithuania’s GHG inventory archive improvement plan”. The plan describes the current archive, which includes the following information:

- Official GHG inventory information submissions (NIR, CRF, SEF);
- QA/QC plans, QC checklists;
- calculation sheets;
- documentation;

- key categories estimates and uncertainty evaluation;
- GHG inventory reviews documentation (prepared for the EC and UNFCCC).

However, the existing archive is not complete. Some materials (especially related to references to activity data (AD) and emission factors (EFs) and referenced documentation) are missing in the central archive and are still kept at the other institutions involved in the GHG inventory preparation (Center for Environmental Policy, State Forestry Survey etc.).

Lithuania notes that in the recently improved national system for GHG inventory preparation, Lithuanian Environmental Protection Agency was nominated as GHG inventory compiler and QA/QC coordinator (starting from 2012 submission preparation process). The GHG inventory archive is already transferred to EPA from the Ministry of Environment for further enhancement and completion.

The plan includes concrete actions to improve the archive (in EPA), including responsible institution and deadline. The main actions are:

- Performing of comprehensive quality checks over each CRF category to identify missing references and documentation in the existing GHG inventory archive. Filling in the documentation quality checklists (EPA);
- According to the checklists results providing of all the missing references and documentation to the EPA (sector experts);
- Completion of the GHG inventory archive with the documentation provided by the sectoral experts (EPA);
- Development of the manual describing common archiving procedures (EPA).

The deadlines for these actions are from November 2011 to June 2012. In addition, it is planned to further improve the archiving procedures as part of a cooperation project with Norway in 2012.

The ERT is of the view that the action plan submitted by Lithuania sufficiently addresses the issue raised by the ERT. The ERT recommends that Lithuania implement the plan and ensure that the improved archive conforms with the requirements related to the archived inventory information contained in the annex to decision 19/CMP.1. The ERT further recommends that the Party report on the improved archive in the next annual submission and ensure that in the next review, it is able to demonstrate that the archive is in line with annex to decision 19/CMP.1.

***National System issues specific to the activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol (2)***

Potential problems/questions:

Paragraphs 5 to 9 of the annex to decision 15/CMP.1, and in particular paragraph 5, sets out the requirements for reporting of information on anthropogenic greenhouse gas emissions by sources and removals by sinks from land use, land-use change and forestry activities under Article 3, paragraph 3, and on forest management under Article 3, paragraph 4, of the Kyoto Protocol.

Paragraph 6(b) of the annex to decision 15/CMP.1 requests that “general information to be reported for activities under Article 3, paragraph 3, and any elected under Article 3, paragraph 4, shall include the geographical location of the boundaries of the areas that encompass:

- (i) Units of land subject to activities under Article 3, paragraph 3;
- (ii) Units of land subject to activities under Article 3, paragraph 3, which would otherwise be included in land subject to elected activities under Article 3, paragraph 4, under the provisions of paragraph 8 of the annex to decision 16/CMP.1;
- (iii) Land subject to elected activities under Article 3, paragraph 4.”

Further, the same paragraph 6(b) of the annex to decision 15/CMP.1 notes that the information is aimed to ensure that units of land and areas of land are identifiable and encourages Parties to elaborate on this information on the basis of any relevant decisions of the COP/MOP on good practice guidance associated with land use, land-use change and forestry under Article 8 .

Paragraph 20 of the annex to decision 16/CMP.1 sets out the requirements for the national inventory systems under Article 5, paragraph 1, that shall ensure that areas of land subject to the KP-LULUCF activities are identifiable, and information about these areas should be provided by each Party included in Annex I in their national inventories in accordance with Article 7. Paragraph 20 of the annex to decision 16/CMP.1 states that such information will be reviewed in accordance with Article 8.

The ERT noted that Lithuania has a national forest inventory system in place that is adequate to identify, in 5-year cycles, the changes in forest management land, including deforestation. However, the ERT noted that the national system of Lithuania could not ensure that all lands subject to the afforestation/reforestation activities<sup>1</sup> under Article 3, paragraph 3, of the Kyoto Protocol are identifiable since 1990.

#### Recommendation by the ERT:

The ERT recommends that Lithuania submit, within 6 weeks, a comprehensive action plan aimed to improve its existing legal, institutional and/or administrative arrangements, as necessary, in such a way that the Party is able to identify the land areas subject to the activities under Article 3, paragraph 3, of the Kyoto Protocol.

The ERT recommends that the action plan contain the measures of the short- and longer-term character, including the period up to the end of the commitment period reporting under the Kyoto Protocol. In preparation of the action plan, the ERT recommends that Lithuania follow the guidance provided in Chapter 4 of the IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry (IPCC/GPG for LULUCF).

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<sup>1</sup> Note that according to decision 16/CMP.1 reforestation and afforestation refers to conversion of non-forest land or land that has not been forested for at least 50 years to forest land, respectively.

Furthermore, the ERT recommends that the Party report, in its next annual submission, on the steps taken towards implementing the action plan submitted.

### **Response/ Information by Party**

Responding on the issue raised above and aiming to improve existing legal, institutional and administrative arrangements in order to be able to identify the land areas subject to the activities under Article 3, paragraph 3, of the Kyoto Protocol, Lithuania submits “Action plan to improve LULUCF reporting” (attached as a separate file).

### **Response of the ERT:**

The potential problem is resolved.

The ERT reviewed the information provided by Lithuania in response to the issues raised during the in-country review and concluded that the action plan developed to improve LULUCF reporting, as well as the detailed information on surveys of carbon stocks in Lithuanian forests provide concrete, detailed and clear information on how the sampling scheme for the NFI functions and how lands subject to KP-LULUCF activities could be identified. The ERT noted that this information demonstrate an improvement in transparency of reporting provided during the review week, and indicate a way forward to overcome the issues raised by the ERT, particularly with regard to the identification of lands in 1990. The plan and the information demonstrate that the national system has all the elements necessary to demonstrate the ability to fulfill the reported requirements related to the activities subject to Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

The adaptation of the present data collection procedures to provide information on afforestation and reforestation of lands during the duration of the commitment period will meet the concerns raised by the ERT, and will help improve the accuracy and transparency of reporting, and the identification of these lands in the national system.

However, the ERT remains concerned about the real implementation of the action plan and operationalization of the proposed activities. It will require a concerted effort by the different agencies in charge of forest data acquisition over time, and harmonization of the different data sets. The efficiency of the action plan will only be proven over time.. In addition, the ERT recognizes that the timely implementation of all activities in the action plan depends on the availability of the necessary financial resources, which are planned to originate from an on-going Norwegian grant.

## Overview of inventory potential problems identified for 2009

### Annex A sources

### 2011 GHG inventory review

### Lithuania

#### Abbreviations:

GPG: IPCC good practice guidance

AD: activity data, EF: emission factor, IEF: implied emission factor

KC: key category, ERT: Expert Review Team

Sector, category, sub-category (with code)	Gas	KC / non-KC	Identified inventory problem in terms of:		
			Missing estimate	Estimate provided but not in line with GPG	Estimate provided but lack of transparency
1. Energy, 1.A Fuel Combustion, Solid Fuels (1.A.1 Energy Industries, 1.A.2 Manufacturing Industries and Construction, 1.A.4 Other Sectors)	CO <sub>2</sub>	KC			X
<b>Description of problem identified:</b>  In its 2011 annual submission, Lithuania reported CO <sub>2</sub> emissions from peat combustion using an emission factor of 102 kg/GJ, which could not be fully substantiated. The full documentation for the derivation of this emission factor was not made available to the ERT during the review week.  Furthermore, this emission factor is lower than the default emission factor (106.0 kg/GJ) provided for CO <sub>2</sub> emissions from peat in the Revised 1996 IPCC guidelines. The ERT notes that the reported emissions from peat could represent a potential underestimate of CO <sub>2</sub> emissions.					
<b>Recommendation by ERT:</b>  The ERT recommends that Lithuania justify the use of its current emission factor for CO <sub>2</sub> emissions from peat combustion and provide documentation to substantiate its derivation and applicability to Lithuania. If that cannot be provided, the ERT recommends that Lithuania recalculate its emissions using the default emission factor in table 1.1 on page 1.13 of the Revised 1996 IPCC Guidelines: Reference Manual.					
<b>Response / Information by Party:</b> <a href="#">Emissions from peat combustion were recalculated using default emission factor (106.0 kg/GJ) provided for CO<sub>2</sub> emissions from peat in the Revised 1996 IPCC guidelines. As a result of recalculations the total energy sector emissions increased in various years from 0.008% to 0.029% and 0.016% in 2009 (results are presented in the attached file <i>Energy recalculations_2011.xls</i>).</a>					
<b>Potential problem unsolved? Rationale:</b>  <a href="#">The potential problem is resolved.</a>  <a href="#">The ERT reviewed information provided by Lithuania in response to the Saturday paper, including the resubmitted CRF tables (dated November 4, 2011). The ERT concludes that the revised emission estimates included in Lithuania's resubmitted CRF tables are calculated using the default emission factor. The ERT is satisfied that these new emission estimates were prepared following the recommended approach.</a>					

# Overview of inventory potential problems identified for 2009

## Annex A sources

### 2011 GHG inventory review

#### Lithuania

##### **Abbreviations:**

GPG: IPCC good practice guidance

AD: activity data, EF: emission factor, IEF: implied emission factor

KC: key category, ERT: Expert Review Team

Sector, category, sub-category (with code)	Gas	KC / non-KC	Identified inventory problem in terms of:		
			Missing estimate	Estimate provided but not in line with GPG	Estimate provided but lack of transparency
1. Energy, 1.A Fuel Combustion, Gaseous Fuels	CO <sub>2</sub>	KC			X
<b>Description of problem identified:</b>  <p>In its 2011 annual submission, Lithuania reported CO<sub>2</sub> emissions from gaseous fuels in the amount of 4,652.96 Gg for 2009 following the reference approach. Lithuania also reported CO<sub>2</sub> emissions from gaseous fuels in the amount of 3,792.16 Gg for 2009 following the sectoral approach. At the same time, Lithuania reported apparent energy consumption of 67.17 PJ following the reference approach and 66.65 PJ following the sectoral approach for the year 2009.</p> <p>During the review, Lithuania explained that the difference in CO<sub>2</sub> emissions (22.7 per cent) was due to the non-energy use of natural gas for ammonia production, but was not able to demonstrate this quantitatively. The ERT notes that Lithuania provided an explanation in the NIR that was not sufficiently transparent, especially with respect to the fact that the large difference in estimated CO<sub>2</sub> emissions is accompanied by such a small difference (0.79 per cent) in apparent energy consumption, as calculated by the two approaches. Therefore, the ERT considers that the difference in emissions implies a potential underestimate of CO<sub>2</sub> emissions from gaseous fuel combustion.</p>					
<b>Recommendation by ERT:</b>  <p>The ERT recommends that Lithuania improve the transparency by recalculating CO<sub>2</sub> emissions from gaseous fuels by the reference approach, appropriately taking into account the full use of natural gas for feedstocks and non-energy use (especially considering ammonia production). The ERT recommends that Lithuania provide an explanation about the non-energy use of gaseous fuels in the documentation boxes in the relevant CRF tables 1A(c) and (d) to confirm that there is no underestimate of CO<sub>2</sub> emissions calculated following the sectoral approach.</p> <p>In case Lithuania cannot demonstrate that there is no underestimation of CO<sub>2</sub> emissions, the ERT recommends that Lithuania recalculate CO<sub>2</sub> emissions from gaseous fuels following the sectoral approach.</p>					
<b>Response / Information by Party:</b> <p>After additional consultations with the Statistics Lithuania it was clarified that natural gas category “non-energy use” includes natural gas consumption for ammonia and methanol production. Emissions from these processes are reported in Industrial Processes sector, therefore evaluating natural gas balance in fuel reference approach natural gas consumed for non-energy use (i.e. consumed in industrial processes) was subtracted from the total amount included in calculations. As a result of recalculation, difference between CO<sub>2</sub> emission in reference approach and sectoral approach (from gaseous fuels) decreased to -0.50- 1.90% and for 2009 the difference was -1.12%. Difference between CO<sub>2</sub> emission in reference approach and sectoral approach (total fuels) decreased to -4.66- 1.76% and for 2009 the difference was 1.09% (results are presented in the attached file <i>Energy recalculations_2011.xls</i>).</p>					

**Potential problem unsolved? Rationale:**

**The potential problem is resolved.**

**The ERT reviewed information provided by Lithuania in response to the Saturday paper, including the resubmitted CRF tables (dated November 4, 2011). The ERT agrees with the recalculated emission estimates. It also accepts Lithuania's explanation of the difference in combustion emission estimates prepared using the sectoral and reference approaches, as provided in Lithuania's resubmitted CRF tables.**

# Overview of inventory potential problems identified for 2009

## Annex A sources

### 2011 GHG inventory review

#### Lithuania

##### **Abbreviations:**

GPG: IPCC good practice guidance

AD: activity data, EF: emission factor, IEF: implied emission factor

KC: key category, ERT: Expert Review Team

Sector, category, sub-category (with code)	Gas	KC / non-KC	Identified inventory problem in terms of:		
			Missing estimate	Estimate provided but not in line with GPG	Estimate provided but lack of transparency
2. Industrial processes, 2.F Consumption of Halocarbons and SF <sub>6</sub> , 2.F.1 Refrigeration and air conditioning equipment	HFCs	KC (Consumption of HFCs identified as KC)	X		
<b>Description of problem identified:</b>  Lithuania did not estimate HFC emissions from transport refrigeration (part of the category refrigeration and air conditioning equipment) for the entire time series in the 2011 annual submission. However, Lithuania reported in Section 4.7 on Planned improvements of the 2011 National Inventory Report that it will estimate HFC emissions from transport refrigeration in its next annual submission.  The ERT considers that the omission of HFC emissions from transport refrigeration leads to an underestimation of HFC emissions from refrigeration and air conditioning equipment.					
<b>Recommendation by ERT:</b>  The ERT recommends that Lithuania estimate HFC emissions from transport refrigeration (sub-category of refrigeration and air conditioning equipment) by collecting the missing activity data and using the available IPCC methodology contained in Chapter 3.7.4 on Stationary refrigeration sub-source category of the IPCC Good Practice Guidance, which provides guidance on transport refrigeration.  In case the activity data cannot be collected, within 6 weeks, following the Article 8 guidelines, the Party may wish to consider making a preliminary emission estimate using an average emission rate from a cluster of countries based on a driver such as population. In case the cluster of countries approach is used for the preliminary estimate, the ERT recommends that for its 2012 annual submission Lithuania collect the national activity data and estimate and report HFC emissions by using the methodology contained in Chapter 3.7.4 on Stationary refrigeration sub-source category of the IPCC Good Practice Guidance, which provides guidance on transport refrigeration.					



**Response / Information by Party:**

HFC emissions from transport refrigeration were evaluated using Tier 2 bottom-up approach. The data on transport refrigerators including vehicle age were provided by a transport vehicles registration company *Regitra*. Parameters for emission calculations were taken from Revised 1996 IPCC Guidelines: average amount of HFC in transport refrigeration systems 8 kg, annual leakage rate 17%, average equipment lifetime 15 years. For estimating emissions of separate components, data on consumption of specific HFCs by two leading Lithuanian transport refrigeration service companies were used. Estimated emissions (in tonnes) are provided in the table below:

	1995	1996	1997	1998	1999	2000	2001	2002
HFC-125	0.00	0.01	0.02	0.03	0.06	0.12	0.25	0.49
HFC-134a	0.00	0.01	0.01	0.03	0.06	0.12	0.23	0.46
HFC-143a	0.00	0.01	0.02	0.04	0.07	0.15	0.29	0.58
<b>Total Gg CO<sub>2</sub> eq</b>	<b>0.03</b>	<b>0.07</b>	<b>0.13</b>	<b>0.26</b>	<b>0.52</b>	<b>1.05</b>	<b>2.10</b>	<b>4.18</b>

	2003	2004	2005	2006	2007	2008	2009
HFC-125	0.74	1.17	1.47	1.90	2.48	2.92	3.05
HFC-134a	0.70	1.09	1.38	1.78	2.32	2.74	2.86
HFC-143a	0.88	1.39	1.75	2.26	2.94	3.47	3.63
<b>Total Gg CO<sub>2</sub> eq</b>	<b>6.35</b>	<b>9.96</b>	<b>12.57</b>	<b>16.22</b>	<b>21.12</b>	<b>24.91</b>	<b>26.06</b>

The overall impact of this recalculation (inclusion of emission from transport refrigeration) in 2009 is an increase in 26.06 Gg CO<sub>2</sub> eq, equivalent to 1.18 per cent of emission from the industrial processes sector.

**Potential problem unsolved? Rationale:**

**The potential problem is resolved.**

**The ERT reviewed information provided by Lithuania in response to the Saturday paper, including the resubmitted CRF tables (dated November 4, 2011). The ERT agrees with the revised emission estimates and concludes that emissions are estimated using the Revised 1996 IPCC Guidelines and are consistent for the entire time series.**

## ANNEX 2

### List of the Lithuanian participants of the in-country review of Lithuania's 2011 Inventory Submission

Name	Position
Dr. Aleksandras Spruogis	Vice-Minister of Environment
Vitalijus Auglys	Director of the Pollution Prevention Department at the Ministry of Environment, Chairman of the National GHG inventory preparation Commission (thereafter Commission)
Dr. Inga Konstantinavičiūtė	Senior Scientist at Lithuanian Energy Institute, Member of the Commission, responsible for energy sector (except transport)
Dr. Steigvilė Byčenkienė	Senior Scientist at the Institute of Physics, Member of the Commission, responsible for energy sector (transport)
Dr. Simonas Valatka	Consultant of the public body Centre for Environmental Policy, Member of the Commission, responsible for industry sector (industrial processes, solvents and other products use), previously responsible for energy sector
Lina Balkelytė	Consultant of the public body Centre for Environmental Policy, Member of the Commission, responsible for industry sector (industrial processes, solvents and other products use)
Dr. Remigijus Juška	Chief Science Research of the Animal Science of the Lithuanian University of Health Sciences, Member of the Commission, responsible for agriculture sector
Audrius Petkevičius	Director of the State Land Fund, Member of the Commission, responsible for LULUCF (non-forest land)
Dr. Ričardas Beniušis	Group Leader at the Department of National Forest Inventory of the State Forest Service, Member of the Commission, responsible LULUCF (forest land)
Dr. Romualdas Lenkaitis	Consultant of the public body Centre for Environmental Policy, Member of the Commission, responsible for waste sector
Dr. Albertas Kasperavičius	Deputy Director of the State Forest Service
Prof. Albertas Kuliešius	Chief Desk Officer of the Department of National Forest Inventory of the State Forest Service
Nerijus Kupstaitis	Head of the Forestry Development Division of the Forest Department of the Ministry of Environment
Eglė Kairienė	Chief Desk Officer of the Environment Status Assessment Department of the Environmental Protection Agency, responsible for the national GHG inventory preparation
Stasilė Znutienė	Head of the Climate Change and Hydrometeorology Division of the Pollution Prevention Department at the Ministry of Environment, the Lithuanian National Focal Point to the UNFCCC;
Jolanta Merkelienė	Chief Desk Officer of the Climate Change and Hydrometeorology Division of the Pollution Prevention Department at the Ministry of Environment, responsible for the supervision of the national GHG inventory preparation
Justė Akmenskytė	Chief Desk Officer of the Lithuanian Environmental Investment Fund, National GHG Registry Administrator
Arvydas Andreikėnas	Head of Energy Statistics Division of the Lithuanian Statistics Department
Rasma Ramoškaitė	Third Secretary of the Strategic Sectors Policy Division of the Economic Security Policy Department, Ministry of Foreign Affairs

## ANNEX 3

### List of improvements made in response to recommendations provided in the 2009 and 2010 ARR

ERT recommendations	Source of the recommendation	How recommendation was addressed	Which submission addressed/will address recommendation
<b>Sector: Energy</b>			
The ERT recommends that Lithuania include in its NIR detailed descriptions of the EFs and estimation methods used, explanations for the notation keys used, an analysis of the emission trends, detailed explanations for recalculations, and information on improvement activities and planned improvements, in accordance with the UNFCCC reporting guidelines.	ARR 2009, ARR 2010	More descriptions on EFs, estimation methods used, explanations on recalculations and planned improvements were added in NIR.	2011
The ERT recommends that Lithuania relocate emission from the solid fuel consumption for peat briquettes production to the subcategory manufacture of solid fuels and other energy industries.	ARR 2010	Further analysis revealed, that peat briquettes are produced from peat, but neither peat nor peat briquettes are used as energy source in production process. Hence, solid fuel consumption in manufacture of solid fuel was reported as “NO”, not “IE” in the CRF.	2011
The ERT recommends that the Party provide, in an annex to the NIR, a clear explanation and the NCVs that were applied.	ARR 2010	The table with NCVs applied (for year 2009) was added.	2011
In order to improve transparency and enable comparison of the two approaches, the ERT recommends that Lithuania exclude feedstocks and all non-energy fuel use from the calculations in the reference approach and apply the corresponding CO <sub>2</sub> EFs as used in the sectoral approach. In addition, the ERT recommends that the Party include, in an annex to the NIR: explanations for any observed differences between the estimates calculated using the two approaches; and an overview of the national energy balance.	ARR 2009, ARR 2010	Consistent EFs for all fuels between the sectoral approach and the reference approach were used in submission. More information on Lithuania’s energy balance is added, for transparency reasons Energy balance 1990-2009 data (LT Energy balance 1990-2009.xls) is attached to the submission. Natural gas balance in fuel reference approach was re-evaluated responding to the Saturday paper. Natural gas consumed for non-energy use was subtracted from the total amount included in calculations. As a result of recalculation, difference between CO <sub>2</sub> emission in reference approach and sectoral approach (from gaseous fuels) decreased to -0.50- 1.90% and for 2009 the difference was - 1.12%.	2011
The ERT recommends that Lithuania include explanations for any differences between the data from Statistics Lithuania and those from the IEA	ARR 2009, ARR 2010	Explanation on differences between IEA and CRF data on coal mines is provided in NIR.	2011
The ERT recommends that Lithuania check the tiers in the	ARR 2010	Tiers used for Lithuania’s estimates on bunker fuels emission were	2011

<b>ERT recommendations</b>	<b>Source of the recommendation</b>	<b>How recommendation was addressed</b>	<b>Which submission addressed/will address recommendation</b>
Revised 1996 IPCC Guidelines and the IPCC good practice guidance and provide detailed description on the method applied in the NIR of its next annual submission.		checked and corrected in the CRF (Tier 1 is used for the estimation of emission from fuels used as bunker fuels).	
The ERT recommends that the Party's energy experts from the Lithuanian Energy Institute and Statistics Lithuania work together to address the time-series inconsistency of the AD on aviation fuels so as to ensure a consistent set of AD for the Party's emission estimates.	ARR 2009, ARR 2010	By 2012 year submission Statistics Department possibilities to address the time-series inconsistency of the AD on aviation fuels will be investigated and reported accordingly in the next NIR.	2012
The ERT recommends that Lithuania provide additional information in its NIR on the approach it has taken in relation to estimating emissions from the consumption of feedstocks and non-energy use of fuels, in particular from coke use, in order to increase transparency and avoid the possibility of double counting or underestimating these GHG emissions. The ERT also recommends that Lithuania report emissions from the consumption of feedstocks and non-energy use of fuels under the industrial processes sector, as recommended in the IPCC good practice guidance.	ARR 2010	Information on the approach taken in relation to estimating emissions from the consumption of feedstocks and non-energy use of fuels is provided in the NIR. Emission from the consumption of feedstocks and non-energy use of fuels is reported under the industrial processes sector: coke used for cast iron production was subtracted from energy production in other non-specified category and added to cast iron production category (already done in 2010 submission), emission from ammonia production with the natural gas used as feedstock is reported under industrial processes as well.	2011
The ERT recommends that Lithuania conduct a study to develop country-specific EFs which accurately reflect the carbon content and other physical properties of the fossil fuel consumed in the country, rather than rely on EFs derived from data for other Parties. The ERT recommends that Lithuania check the tiers in the Revised 1996 IPCC Guidelines and the IPCC good practice guidance and, provide detailed description on the method applied in the NIR of its next annual submission.	ARR 2009, ARR 2010	According to the EU assistance project "Capacity building implementing the Kyoto protocol requirements in Lithuania" study on EF's in energy sector was conducted in 2008. The results of the study in Annex 4 concluded that country-specific EFs for fuel combustion should be left unchanged (Study in English is available at: <a href="http://www.am.lt/VI/index.php#a/7941">http://www.am.lt/VI/index.php#a/7941</a> ). Additionally, country specific CO <sub>2</sub> EFs were developed for 2011 submission, based on research data from the Lithuanian oil refinery JSC "Orlen Lietuva".	2011
The ERT recommends that Lithuania provide relevant information on the national energy balance and information on how fuel consumption data are included in the calculations in the next annual submission.	ARR 2010	Detailed energy consumption data for the entire time series (1990–2009) is attached to the NIR (LT Energy balance 1990-2009. xls). More descriptions on how fuel consumption data are included in the calculations were added in the NIR.	2011
Explanatory information on AD for road transportation category was not provided in the NIR. The ERT recommends that the Party provide a transparent description of AD such as how AD are collected in the NIR of its next annual submission.	ARR 2010	Explanatory information on how AD to calculate road transportation emissions is provided in the NIR.	2011
The ERT recommends that Lithuania estimate emissions of	ARR 2009	Emissions of CO <sub>2</sub> and CH <sub>4</sub> from natural gas transmission using	2010

ERT recommendations	Source of the recommendation	How recommendation was addressed	Which submission addressed/will address recommendation
CO2 and CH4 from natural gas storage using a country specific EF if available or the default EFs from the IPCC good practice guidance for natural gas transmission and storage (shown in table 2.16 of the IPCC good practice guidance).		default EF of the IPCC good practice guidance are included in the submission.	
The ERT recommended that the Party estimate emissions from other leakage of natural gas using country-specific EFs if available or the default EFs for gas consumption in the former Union of Soviet Socialist Republics (USSR) and Central and Eastern European countries from the Revised 1996 IPCC Guidelines.	ARR 2009	Emissions from natural gas distribution were calculated by using emission factors provided in the IPCC Good Practice Guidelines (2000) and based on pipeline length. It should be assumed that emissions from natural gas distribution cover emissions at residential and commercial sectors and in industrial plants and power stations. Therefore these emissions were not calculated separately and marked with notation key “IE”.	2010
The ERT considered that emissions from off-road vehicles and machinery have been underestimated, particularly in the case of CH4 and N2O emissions, and recommended that the Party select appropriate AD and include the estimates, calculated using the EFs for mobile combustion, under the corresponding separate subcategory.	ARR 2010	Emissions from off-road vehicles are reported in this submission.	2011
The ERT recommends that Lithuania provide a clear explanation in the NIR of its next annual submission on how emissions from military aviation are allocated.	ARR 2010	Explanation on how emissions from military aviation are allocated in CRF is included in the NIR.	2011
<b>Sector: Industry</b>			
The ERT recommends that Lithuania clarify if reported as “NE” is correct for the following categories: CO2 emissions from asphalt roofing and from road paving with asphalt, CH4 and N2O emissions from glass production, CO2 emissions from food and drink and N2O emissions from other under solvent and other product use. There are no estimations provided for any emissions from consumption of halocarbons and SF6 for the years 1990–1994, which are reported as “NO” and not applicable (“NA”).	ARR 2010	CO2 emissions from asphalt roofing and from road paving with asphalt, CH4 and N2O emissions from glass production, CO2 emissions from food and drink are not estimated (reported “NE”) due to no IPCC methodology is available to calculate these emissions. For this submission, N2O emissions from N2O use in anesthesia was calculated for the first time. It is planned to reassess F-gases emissions for the years 1990–1994. If the analysis will show, that emissions occurred during this period, emissions will be calculated using extrapolation for the next submission (NIR 2012).	2011, 2012
The ERT recommends that Lithuania verify production and EF data provided by the industry using, for instance, data from the European Union emissions trading scheme.	ARR 2009, ARR 2010	Clinker production data reported in GHG inventory was verified with the data provided in company’s report to EU ETS. Further verification of production and EFs data provided by the industry in EU ETS reports and data used in GHG inventory is planned for the next submission.	2011, 2012

ERT recommendations	Source of the recommendation	How recommendation was addressed	Which submission addressed/will address recommendation
The ERT recommends that Lithuania verify the reported 5 per cent calcinated fraction and provide an explanation for the difference between its plant-specific CKD correction factor (1.00065 per cent) and the default value from the IPCC good practice guidance (2 per cent).	ARR 2010	This recommendation is included to the GHG inventory improvement plan and will be addressed in the NIR 2012.	2012
The ERT recommends that Lithuania improve its description of the methodology used to calculate CO <sub>2</sub> emissions from ammonia production in its next NIR. The ERT noted that the carbon content of natural gas fluctuated over the time series; therefore, it also recommends that Lithuania verify and explain the wide range of carbon contents (0.40–0.52 kg C/m <sup>3</sup> ) and report on this.	ARR 2009, ARR 2010	Data on carbon content of natural gas used for ammonia production is provided in the NIR. The reasons of fluctuations of carbon content in natural gas are explained.	2011
The ERT recommends Lithuania to improve the EFs used for the calculation of emissions from nitric acid production using measured data.	ARR 2009, ARR 2010	Emission from nitric acid production was recalculated using plant specific emission factors for all time series.	2011
The ERT recommends to estimate HFC emission from fire extinguishers.	ARR 2009	HFC emission from fire extinguishers was calculated.	2010
The ERT recommends that Lithuania calculate and report estimates of HFC, PFC and SF <sub>6</sub> emissions (actual and potential) from consumption of halocarbons for mobile air-conditioning, domestic and transport refrigeration, metered dose inhalers, and solvent and semiconductor manufacture.	ARR 2010	HFCs emissions (actual) from consumption of halocarbons for mobile air-conditioning, domestic refrigeration, metered dose inhalers and “other use of HFCs” were estimated in this submission. Emission from semiconductor manufacture is not occurring in Lithuania and reported “NO”. In response to the list of the potential problems and further questions raised in the Saturday paper, HFC emission from from transport refrigeration is estimated.	2011
The ERT recommends that Lithuania re-evaluate the leakage rates on the basis of type of application and account for emissions of F-gases remaining in products at decommissioning. The ERT also recommends that Lithuania investigate whether all sources of SF <sub>6</sub> emissions from electrical equipment are covered in the inventory and include emission estimates and a description of the estimation methodology used.	ARR 2009, ARR 2010	This recommendation is included to the GHG inventory improvement plan and will be addressed in the NIR 2012.	2012
The ERT recommends that Lithuania prepare and report estimates of emissions from metal production in its next inventory submission, in accordance with the IPCC good practice guidance.	ARR 2009	Emissions from pig iron production is reported.	2010

ERT recommendations	Source of the recommendation	How recommendation was addressed	Which submission addressed/will address recommendation
CO2 emissions from solvent and other product use were estimated from NMVOC emissions. The actual values and relevant assumptions are not described in the NIR, so it is difficult to assess them. The ERT recommends that the Party evaluate the method used to calculate these CO2 emissions and provide relevant information in the NIR.	ARR 2009	Methodology to estimate CO2 emissions from solvent and other product use was described in the NIR.	2010
<b>Sector: Agriculture</b>			
Since Lithuania has rabbits and an increasing number of fur animals, the ERT encourages Lithuania to estimate emissions from “other” livestock.	ARR 2009, ARR 2010	CH4 and N2O emissions from fur-bearing animals (foxes, polar foxes, minks), nutria’s and rabbits under the enteric fermentation and manure management categories were reported.	2011
Rice cultivation, prescribed burning of savannas and field burning of agricultural residues were reported as “NO”. In order to improve transparency, the ERT recommends that Lithuania include the reference in the NIR which supports the fact that such activities do not occur in Lithuania.	ARR 2009, ARR 2010	References explaining that such activities do not occur in Lithuania were added.	2011
The ERT recommends that Lithuania include in the NIR the disaggregated population data on non-dairy cattle used in the calculation of relevant emission estimates for the entire time series, detailed information about the production characteristics of the cattle used to calculate the gross energy intake, as well as detailed information on country-specific parameters.	ARR 2009, ARR 2010	Disaggregated population data on non-dairy cattle, the formula used for the calculation of the gross energy intake is provided in the NIR.	2011
The NIR contains undocumented assumptions and expert judgements as well as references whose relevance to the inventory data is not described. The ERT recommends that Lithuania provide information on all assumptions applied (such as climate conditions) and expert judgements, and the relevant references in the NIR.	ARR 2009, ARR 2010	Information on climate conditions, relevant references are provided in the NIR.	2011
The ERT recommends that the CH4 EFs calculated for manure management for each subcategory of non-dairy cattle be presented in table 6.12 of the NIR.	ARR 2009, ARR 2010	CH4 EF for manure management was calculated on aggregated level for non-dairy cattle, therefore it can’t be presented for each subcategory.	2011
In order the allocation of manure to AWMS reflects the changes which have taken place within agricultural activities since 1990, the ERT recommends that Lithuania update the values used for the 1990–2006 period or, if necessary, apply estimated values using extrapolation for that period.	ARR 2010	The values of allocated manure to different animal waste management systems were recalculated using extrapolation for 1990-2006 period.	2011

<b>ERT recommendations</b>	<b>Source of the recommendation</b>	<b>How recommendation was addressed</b>	<b>Which submission addressed/will address recommendation</b>
The ERT recommends that Lithuania correct the data and information in CRF table 4.B(a) on MCFs by making them consistent with the relevant figures from the NIR or with the appropriate notation keys.	ARR 2010	The data and information in CRF table 4.B(a) is made consistent with relevant figures in the NIR.	2011
In order to ensure time-series consistency, the ERT recommends that the Party undertake recalculations of the data series of volatile solid excretion rates for the 1990–2007 period, using national data based on the approach applied to the estimation for 2008.	ARR 2010	In order to ensure time-series consistency, recalculations of the data series of volatile solid excretion rates for the 1990-2007 period using national data were performed.	2011
The ERT recommends that Lithuania either report in the relevant CRF table the adjusted values for N input from fertilizers, calculated following equation 4.22 from the IPCC good practice guidance, or provide an explanation for the difference in the IEF in the NIR and the documentation box of the relevant CRF table.	ARR 2009, ARR 2010	Adjusted values for N input from fertilizers were reported in the relevant CRF table.	2011
The ERT recommends that Lithuania report in its NIR the types of crop covered in its inventory and, if possible, report the production data by crop type in CRF table 4.F.	ARR 2009, ARR 2010	Information on types of crop considered in the calculation of emissions from N-fixing crops and from crop residue is provided.	2011
The ERT recommends that Lithuania provide in the NIR the relevance of the term “Ekoagross” in relation to the annual data on the area of organic soils cultivated areas, considering also the relevant definitions provided in the IPCC good practice guidance. Additionally, the ERT recommends that the Party undertake recalculations for the period 1990–2006 of the data series on the area of organic cultivated soils in a similar manner as for those undertaken for the 2007–2008 period.	ARR 2010	The emissions from histosols were recalculated using reliable activity data in NIR 2011. “Ekoagros” data on the area of organic soils is not longer used.	2011
The ERT recommends that the Party include in its NIR a description of the relevance of “UAB Agrochema” as well as information on the consistency of the data provided by UAB Agrochema and by IFIA.	ARR 2010	The description of the relevance of “UAB Agrochema” as well as information on the consistency of the data provided by UAB Agrochema and by IFIA is included in the NIR.	2011
The ERT recommends that Lithuania improve the transparency of the NIR by reporting all the elements pertaining to the calculation of FracGRAZ.	ARR 2010	Elements pertaining to the calculation of FracGRAZ are provided.	2011
The ERT recommends that Lithuania use the updated MCFs from table 4.10 of the IPCC good practice	ARR 2009	Recalculation by changing the MCFs relevant to dairy cattle, non-dairy cattle, swine and liquid/slurry and pit storage considering the revised	2010



ERT recommendations	Source of the recommendation	How recommendation was addressed	Which submission addressed/will address recommendation
Guidance.		values presented in table 4.10 of the IPCC good practice guidance was implemented.	
The ERT recommends that Lithuania perform cross-cutting checks of country-specific EFs against the IPCC defaults and the EFs used by other Parties with similar national conditions, as well as of data on cattle population from the domestic animal register against corresponding official statistical data, and explain any significant differences.	ARR 2009	As part of the QC activities specific to the category enteric fermentation the comparison of the data sets at the level of the dairy cattle and of the total cattle, considering the data provided from the domestic animal registry and by the Department of Statistics, as well as comparison of the EFs, considering also the associated data on milk yield and weight data from the neighbouring countries was implemented.	2010
The values of FracNCRBF applied in the emission from N-fixing crops and crop residues calculation process by Lithuania were inconsistent (0.3 and 0.012 for N-fixing crops and crop residues, respectively). The ERT recommends that Lithuania calculate emissions using a consistent value of FracNCRBF for both N-fixing crops and crop residues.	ARR 2009	The value of 0.03 kg N/kg dry biomass, as provided in table 4.19 of the Revised 1996 IPCC Guidelines, for FracNCRBF, for the calculation of emissions from N-fixing crops and from crop residue was made consistent.	2010
<b>Sector: LULUCF</b>			
The ERT recommends that Lithuania estimate all mandatory categories of the LULUCF sector (such as cropland, grassland) in order to make its reporting on LULUCF complete. The ERT recommends that Lithuania improve land-use change time-series consistency by correcting the data for the early 1990s to reflect the application of uniform definitions of land uses throughout the reporting period. The ERT also recommends that Lithuania review its land classification system and ensure that all lands are reported under the appropriate land categories.	ARR 2009, ARR 2010	Data on land categories in LULUCF sector is under harmonization as a result of cooperation between the State Land Fund and the State Forest Service experts, as to ensure consistent time series and land representation. Land use data harmonization will be implemented also during development of the studies, which are envisaged in Lithuania's action plan to improve LULUCF reporting. We expect that the results of the analysis for area data harmonization will be provided in NIR 2012 submission.	2012
The ERT recommends that Lithuania ensure that the estimation methods implemented are capable of identifying land-use changes at the appropriate (0.1 ha) scale for the minimum forest area selected.	ARR 2009, ARR 2010	According to Lithuanian legislation, land-use changes and minimum forest areas are identified at the 0,1 ha scale, which is also consistent with datasets used for the GHG estimation.	2011
The ERT recommends that Lithuania provide, in its next annual submission, a thorough explanation of each of the methodological changes that resulted in the recalculations that occurred between 2009 and 2010 for the LULUCF sector.	ARR 2010	Explanations on methodological changes and newer datasets resulted in the recalculations performed between 2010 and 2011 were provided in NIR 2011.	2011
The ERT noted that the EFs for forest fires that are listed in	ARR 2010	EFs used for forest fires were reviewed and emissions were	2011

ERT recommendations	Source of the recommendation	How recommendation was addressed	Which submission addressed/will address recommendation
table 3A.1.15 are typically higher than the factors listed in the NIR. The ERT recommends that Lithuania review the EFs used for this category and provide explanations for the choice of the EFs applied.		recalculated.	
<b>Sector: Waste</b>			
N <sub>2</sub> O emissions from waste incineration are reported as “NE”. The ERT encourages Lithuania to use other reliable means of developing N <sub>2</sub> O EFs in accordance with the IPCC good practice guidance and estimate N <sub>2</sub> O emissions.	ARR 2009, ARR 2010	N <sub>2</sub> O emissions from waste incineration were calculated.	2011
The ERT recommends that Lithuania provide explanations with regard to the rationale for the selection of the methane generation rate constant.	ARR 2009, ARR 2010	Explanation with regard to the selection of the methane generation rate constant is included.	2011
The ERT recommends that Lithuania provide the amount of recovered CH <sub>4</sub> from wastewater handling and a detailed explanation of the methodology used for the estimation of CH <sub>4</sub> emissions and their recovery to improve transparency.	ARR 2010	The amount of recovered CH <sub>4</sub> from wastewater handling and explanation of the methodology used for the estimation of CH <sub>4</sub> emissions is added.	2011
The ERT recommends that Lithuania update the estimation equation used to calculate CH <sub>4</sub> emissions from wastewater handling according to IPCC GPG.	ARR 2010	This recommendation is included to the GHG inventory improvement plan and will be addressed in the NIR 2012.	2012
The ERT recommends that Lithuania improve transparency by providing a more detailed description of the regression analysis for AD in 1990 and AD trends from 1990 to 2008 with reference to the change in population and economic growth.	ARR 2010	Explanation is included in the NIR, that AD for year 1990 was evaluated by linear extrapolation of 1991-1993 data. Detailed description of the AD trends from 1990 to 2009 with reference to the change in population and economic growth will be provided in the next annual submission.	2011
The ERT recommends that Lithuania provide the reason for the recalculation of CO <sub>2</sub> emissions from waste incineration for 2004 to 2007, which resulted in a 52.8 per cent decrease in the estimate for 2007 compared with the 2009 submission, provide a description of the changed method, and the result of recalculation in the NIR and in CRF table 8(b).	ARR 2010	The reason for the recalculation in waste incineration sector performed in 2009 submission is provided.	2011
The ERT recommends that Lithuania include explanation on fluctuations of CO <sub>2</sub> emissions from incineration of hazardous waste.	ARR 2010	More information on waste incineration conditions in Lithuania is added.	2011

ERT recommendations	Source of the recommendation	How recommendation was addressed	Which submission addressed/will address recommendation
<b>Sector: KP-LULUCF</b>			
The ERT recommends that Lithuania put in place the necessary arrangements to report emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, in accordance with these requirements set out in paragraph 5 to 9 of the annex to decision 15/CMP.1 in its next annual submission.	ARR 2010	Lithuania put a lot of efforts to improve KP-LULUCF reporting during 2010 and 2011. Institutional arrangements for the national system to ensure that report emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, are reported in accordance with requirements of decision 15/CMP.1 were put in place. In 2011 submission Lithuania reported emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol. Land under the Convention and KP-LULUCF were reported consistently and requirement not to double count land areas subject to KP-LULUCF activities has been implemented. In response to the Saturday paper 2011, Lithuania developed action plan to improve reporting on KP-LULUCF (in particular to ensure that areas of land subject to KP-LULUCF activities are identifiable), which is currently under the implementation.	2011, 2012

## **ANNEX 4**

### **Information about implemented measures pursuant to the Action Plan to improve LULUCF reporting of Lithuania**

Legal acts adopted in December 2011:

- Order of the Minister of Environment and Minister of Agriculture on Approval of Action plan to improve LULUCF reporting of Lithuania (adopted on 16-12-2011, No D1-987/3D-927)
- Order of the Minister of Environment on Approval of Harmonised Principles for LULUCF reporting.

Prepared ToR and announced procurement tenders of the following studies: “Forest land changes in Lithuania during 1990-2011” and “Changes of areas of croplands, grasslands, wetlands, settlements and other lands in Lithuania during 1990-2011”. The ToR summaries are provided below.

### **TERMS OF REFERENCE of the Study “Forest land changes in Lithuania during 1990-2011”**

#### **1. Background**

The study is launched implementing United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol requirements in order to comprehensively identify and quantify areas specific to Land use, land use change and forestry (LULUCF) activities annually in the period of 1990-2011.

#### **2. Objective**

The main objective of the study: to identify forest land areas and their changes in Lithuania during 1990-2011 following the requirements of Good Practice Guidance for Land Use, Land-Use Change and Forestry, IPCC 2003. Forest land areas and their changes to be identified (annually in 1990-2011):

- forest land remaining forest land (FF), forest management (FM),
  - out of them forest land areas converted to forest land less than 20 years before (LF),
- afforested areas with human induce (A1, R1),
  - out of them areas where forest never grew before the afforestation for at least 50 years (A1)
- naturally afforested areas (A2, R2),
  - out of them areas where forest never grew before the afforestation for at least 50 years (A2)
- deforested areas (D),

#### **3. Study object and material**

The study object is all Lithuanian forest land territory during 1990-2011 years.

The main data sources to be used: National forest inventory (NFI), executed on 16 325 systematically distributed permanent sample plots, and Lithuanian Republic state Forest cadastre, Standwise forest inventory databases, orthophoto maps (S 1:10 000), satellite images and archive material backwards to 1946-1949.

#### **4. Methods**

Forest land areas and their changes (LF, A/R/D) should be assessed using country-wise mapping and sample based (on the NFI sample plots grid) techniques. Sample based methods are to be used for the assessment of LULUCF activities under the Convention, and country-wise mapping – for the assessment of LULUCF activities under Article 3.3 and 3.4 of the Kyoto Protocol.

The data of NFI direct measurements in the field should be used to identify forest land use category (described above and coded: FF, FM, LF, A1, A2, R1, R2, D) in the period from the start of NFI measurements in 1998 until 2011. The information about land use before the start of NFI back to 1990 should be retrieved using Forest Cadastre database, available aerial photography material and dendrochronological analysis methods.

In the course of analysis of available cartographical material (State Forest Cadastre databases, SFI maps, archive orthophoto maps, etc.), the GIS based databases (vector and raster format files) of annually afforested, reforested, deforested areas and areas remaining under forest management during 1990-2011 should be prepared.

#### **5. Terms**

Preparation of land use change matrix for LULUCF (forest part) – until 1 March, 2012.

Finalization of the study – until 1 May, 2012.

#### **6. Required outputs**

*(on annual base for the period 1990-2011):*

- to make area calculations and prepare land use change matrix;
- to identify and distinguish units of land subject to activities under Article 3, paragraph 3, which would otherwise be included in land subject to elected activities under Article 3, paragraph 4, under the provisions of paragraph 8 of the annex to decision 16/CMP.1;
- to prepare GIS layers of afforested, reforested and deforested (A/R/D) areas and areas remaining under forest management;
- to prepare report showing considered land unit changes;
- to elaborate proposals on land use definitions harmonization and development of the harmonized methodology for the data evaluation and estimation of removals and emissions for LULUCF sector according to the UNFCCC and the Kyoto Protocol requirements.

### **TERMS OF REFERENCE of the Study “Changes of areas of croplands, grasslands, wetlands, settlements and other lands in Lithuania during 1990-2012”**

#### **1. Background**

The study is launched implementing United Nations Framework Convention on Climate Change (UNFCCC) requirements in order to comprehensively identify and quantify areas specific to Land use, land use change and forestry (LULUCF) activities annually in the period of 1990-2011.

#### **2. Objective**

The main objective of the study: to identify land use annual changes in Lithuania during 1990-2011 following the requirements of Good Practice Guidance for Land Use, Land-Use Change and Forestry, IPCC 2003. Land use changes should be identified (annually in 1990-2011) analyzing all available historical data on land uses in statistical and graphical form and assessing historical data collection methods. Actions to be performed:

- analysis of data sources and land use data collection,
- identification of land areas on sample plots,

- compilation of sample plots data bases,
- analyses of croplands, grasslands, wetlands, settlements and other lands statistics,
- justification of research methodology and harmonization of applied methods.

### **3. Study object and material**

The study object is all Lithuanian land territory during 1990-2011 years.

The main data sources to be used: 1990 year land areas analogical inventory plans; 1995-98, 2005-06, 2009-10 digital orthophotomaps S 1:10 000 (ORT10LT), Lithuanian land fund statistical data, Land areas and croplands declaration database.

### **4. Methods**

Land areas and their changes should be assessed basing on National Forestry Inventory sample plots grid and using land fund statistical data, digital orthophotomaps, satellite images and Land areas and croplands declaration database. Analysis will be executed on 11 thousand systematically distributed permanent sample plots. Sample based methods are to be used for the assessment of LULUCF activities under the Convention.

In the course of analysis, land-use change matrix (annual change of areas of croplands, grasslands, wetlands, settlements and other lands) in Lithuania during 1990-2011 should be prepared. Proposals on land use definitions harmonization used 1990-2011 and the development of the harmonized methodology for the data evaluation and estimation of removals and emissions for LULUCF sector according to the UNFCCC requirements will be elaborated.

### **5. Terms**

Preparation of land use change matrix for LULUCF (non-forest land areas) – until 1 March, 2012.

Finalization of the study – until 1 June, 2012.

### **6. Required outputs**

*(on annual base for the period 1990-2011):*

- to make area calculations and prepare land use change matrix;
- to identify annual change of areas of croplands, grasslands, wetlands, settlements and other lands;
- to prepare report showing considered land unit changes;
- to elaborate proposals on land use definitions harmonization and development of the harmonized methodology for the data evaluation and estimation of removals and emissions for LULUCF sector according to the UNFCCC requirements

*The entire ToR documents are available in Lithuanian language.*

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