WRITTEN SUBMISSION FROM UKRAINE

ПОСОЛЬСТВО УКРАЇНИ У
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BOTSCHAFT DER UKRAINE IN
DER BUNDESREPUBLIK
DEUTSCHLAND

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02.08.2011

Mr. Feng Gao
Secretary
Compliance Committee
UNFCCC secretariat

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Dear Mr. Feng Gao,

In respect to our notification for the Compliance Committee's Secretariat, please find enclosed the written submission of Ukraine under Section X, paragraph 1 (b) of the annex to decision 27/CMP.1, with regard to the Question of Implementation raised by the Compliance Committee, concerning the annual GHG inventory submission of Ukraine submitted in 2010.

Alongside the written submission, please find attached the annexes covering the issues comprised and referred in the written submission.

Sincerely,

Extraordinary and Plenipotentiary
Ambassador of Ukraine
to the Federal Republic of Germany

N.Zarudna

* This document has been reissued for technical reasons

WRITTEN SUBMISSION FROM UKRAINE

Under Section X of the Annex to Decision 27/CMP.1

in response to the decision of the Compliance Committee of CC-2011-2-2/Ukraine/EB
we are pleased to submit the following submission
on behalf of the Government of Ukraine

CONTENT

Executive Summary

On 6 June 2011, the Compliance Committee received from the UNFCCC Secretariat the Report of the individual review of the annual submission of Ukraine submitted in 2010 (FCCC/ARR/2010/UKR), in which questions of implementation were listed. The questions of implementation raised concerned the functioning of the national system and fulfilment of specific requirements with regard to reporting of LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

On 29 June 2011, the Enforcement Branch of the Compliance Committee concluded its preliminary examination (CC-2011-2-2/Ukraine/EB) deciding to proceed with the questions of implementation.

In response to the decision of the Enforcement Branch of the Compliance Committee of CC-2011-2-2/Ukraine/EB, Ukraine is providing the written submission attached, where it demonstrates that the issues underlying the questions of implementation raised have been resolved:

- In the preparation of the 2011 national GHG inventory submission, Ukraine demonstrated the capability of its national system to function fully and effectively. In total, in 2011 inventory submission of Ukraine, 107 recommendations and comments of the ERT were taken into consideration. In addition, Ukraine independently improved the estimation of GHG emissions in several categories, and provided additional information to facilitate the review of its GHG inventory submission;

- Ukraine has developed a GIS-based database fully compliant with the requirements for identification of areas of land subject to LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol in accordance with paragraph 20 of annex to decision 16/CMP.1. The results of this work have been presented in the 2011 GHG inventory submission.

Based on the above, Ukraine requests the Enforcement Branch of the Compliance Committee:

1) to determine not to proceed further with Questions of Implementation raised in the report of the individual review of the annual submission of Ukraine submitted in 2010 of 6 June 2011 (CC/ERT/ARR/2011/28) and Decision On Preliminary Examination (CC-2011-2-2/Ukraine/EB)

or *alternatively*

2) to defer the decision until the initial feedback from the scheduled in-country review of annual inventory of Ukraine submitted in 2011 is available, as provided for under paragraph 11, section IX, of the annex to decision 27/CMP.1

or *alternatively*

3) to refer the Questions of Implementation to the facilitative branch for consideration with the view to provide Ukraine advice and assistance taking into account is national conditions and specific circumstances as provided for by paragraph 12, section IX, Annex to Decision 27/CMP.1.

I. Background

1. Ukraine, as a Party included in Annex I to the UN Framework Convention on Climate Change (UNFCCC), has, inter alia, the obligation to develop, periodically update, publish and provide to the Conference of the Parties through the Secretariat, the national inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases ("GHG") not controlled by the Montreal Protocol ("the national GHG inventory" or "NI"), as required by Article 4, paragraph 1, of the UNFCCC.

2. Ukraine, as a Party included in Annex I to the UNFCCC which is also a Party to the Kyoto Protocol, inter alia, has the obligation to establish a national system for estimating anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol ("the national GHG inventory system" or "NIS"), as required by Article 5, paragraph 1, of the Kyoto Protocol, as well as the obligation to submit annually the national GHG inventory as required by the UNFCCC taking into account also the requirements on provision of additional information pursuant to Article 7, paragraph 1, of the Kyoto Protocol.

3. Ukraine, in compliance with its obligations described in paragraphs 1 and 2 above, presented the national GHG inventory report ("NIR") on 12 April 2010 and tables in common reporting format ("CRF") on 13 April 2010, in accordance with the timetable established by decision 3/CP.1 and Article 7, paragraph 1, of the Kyoto Protocol. The NIR and CRF tables covered the period from the base year (1990) to 2008.

4. Ukraine resubmitted the CRF tables on 22 and 25 May 2010 and resubmitted the NIR on May 22, 2010, within the timelines stipulated by decision 15/CMP.1.

5. In accordance to the guidelines for review under Article 8, set out in the annex to decision 22/CMP.1, the centralized review of the 2010 annual submission of Ukraine was conducted from 30 August to 4 September 2010.

6. On 4 September 2010, Ukraine received from the ERT a list of potential problems («Potential Problems and Further Questions from the ERT formulated in the course of the 2010 review of the greenhouse gas inventories of Ukraine submitted in 2010", Attachment A), as provided for by paragraph 73 of the annex to decision 22/CMP.1. After the centralized review, Ukraine officially submitted revised emission estimates on 17 October 2010 in response to the list of potential problems by the ERT.

7. The ERT issued the draft report of the individual review of the annual submission of Ukraine submitted in 2010 on 15 March 2011 ("draft annual review report") and the final report ("final annual review report") on 3 June 2011. In the report, the ERT concluded that the general and specific functions of the national system of Ukraine did not operate fully in accordance with requirements set out in the annex to decision 19/CMP.1. It concluded the final report with questions of implementation.

8. On 6 June 2011, the Compliance Committee received from the UNFCCC Secretariat the Report of the individual review of the annual submission of Ukraine submitted in 2010 (FCCC/ARR/2010/UKR), in which questions of implementation were listed.

9. On 29 May 2011, the Enforcement Branch of the Compliance Committee concluded its preliminary examination (CC-2011-2-2/Ukraine/EB) deciding to proceed with the questions of implementation.

II. The scope of questions of implementation raised by the ERT

10. In the Report of the individual review of the annual submission of Ukraine submitted in 2010 (FCCC/ARR/2010/UKR) published by UNFCCC secretariat on June 3, 2011, the ERT described the scope of questions of implementation raised in connection with the 2010 inventory submission of Ukraine as paragraphs 184–186 and 188 of the report. For the benefit of the Compliance Committee, these paragraphs are reproduced below:

184. From the information contained in the NIR, CRF tables and the additional information received during and after the centralized review the ERT concludes that the Ukrainian national system does not fully comply with the guidelines for national systems under Article 5, paragraph 1 of the Kyoto Protocol (decision 19/CMP.1) and the guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol (decision 15/CMP.1). The ERT concludes that some general and specific functions of the national system did not ensure that the 2010 annual submission of Ukraine was sufficiently transparent, consistent, comparable, complete and accurate, as required by the guidelines mentioned above, the UNFCCC reporting guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF.

185. In particular, the ERT concludes that the following general and specific functions required for national systems did not operate fully in accordance with requirements set out in the annex to decision 19/CMP.1: ensure sufficient capacity for data collection for estimating anthropogenic GHG emissions by sources and removals by sinks (para. 10(b)); prepare national annual inventories and supplementary information in a timely manner in accordance with Article 5 and Article 7, paragraphs 1 and 2, and relevant decisions of the COP and/or Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (COP/MOP) (para. 10(d)); prepare estimates in accordance with the methods described in the Revised 1996 IPCC Guidelines, as elaborated by the IPCC good practice guidance and the IPCC good practice guidance for LULUCF, and ensure that appropriate methods are used to estimate emissions from key categories (para. 14(b)); collect sufficient AD, process information and EFs as are necessary to support the methods selected for estimating anthropogenic GHG emissions by sources and removals by sinks (para. 14(c)); provide ERTs 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 (para. 16(b)); and respond to requests for clarifying inventory information resulting from the different stages of the review process of the inventory information in accordance with Article 8 (para. 16(c)).

186. In this respect, the ERT notes that over the last few years Ukraine has not been able to collect the necessary AD, process information and EFs to estimate the relevant missing GHG emissions by sources and removals by sinks, as applicable. The ERT further notes that Ukraine has, in the past and current NIRs, consistently presented plans to estimate the missing GHG emissions, but these have not been implemented in its 2010 submission. The ERT also notes that in response to the list of potential problems and further questions formulated by the ERT, Ukraine stated that, as a result of economic crisis and limited public funds in the country, the investigations aimed to support the national system had not been funded and that part of the financial resources from the sale of AAUs is planned to be used for the support of the national GHG inventory.

188. The ERT also concludes from the information contained in the NIR, CRF tables and the additional information received during and after the centralized review that the Ukrainian national system is not able to ensure that areas of land subject to LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol are identifiable in accordance with paragraph 20 of annex to decision 16/CMP.1.

11. The final annual review report also acknowledges that Ukraine strongly disagrees with the conclusion of the ERT and considers that this conclusion is not justified and that the specific reasons on the basis of which the ERT has made this conclusion have not been made sufficiently transparent (paragraph 187).

12. In this regard, Ukraine draws attention of the Compliance Committee to the fact that in the final annual review report, when describing specific requirements for national systems, which in the view of ERT the national inventory system of Ukraine does not fully fulfill, the ERT names paragraphs 10 (b), 10 (d), 14 (b), 14 (c), 16 (b), 16 (c) of the annex to decision 19/CMP.1.

13. The Guidelines for review under Article 8 of the Kyoto Protocol on the issue of raising questions of implementation stipulate in paragraph 7 of the annex to decision 22/CMP.1:

If the expert review team identifies potential problems during the review, it shall put questions to the Party included in Annex I regarding these potential problems and offer advice to the Party on how to correct them.

and in paragraph 8 of the annex to decision 22/CMP.1:

Only if an unresolved problem pertaining to language of a mandatory nature in these guidelines influencing the fulfillment of commitments still exists after the Party included in Annex I has been provided with opportunities to correct the problem within the time frames established under the relevant review procedures, shall that problem be listed as a question of implementation in the final review reports.

14. Regarding the timing of the procedure, the annex to decision 22/CMP.1 stipulates in paragraphs 73 and 74 that

The expert review team shall list all problems identified, indicating which would need an adjustment, and send this list to the Party included in Annex I no later than 25 weeks from the submission due date of the annual inventory, if the inventory was submitted at least six weeks after the submission due date.

The Party included in Annex I shall comment on these questions within six weeks and, where requested by the review team, may provide revised estimates.

15. Ukraine draws attention of the Compliance Committee to the fact that in the list of potential problems identified by ERT provided to Ukraine on 4 September 2010 under paragraph 73 of the annex to decision 22/CMP.1 on the issue of the performance of the national inventory system under potential problem #2, the ERT referred to only to two paragraphs of the annex to decision 19/CMP.1. More specifically, the ERT noted the following:

In accordance to Decision 19/CMP.1 paras. 10(b) and 14(c) of the Annex, each Party shall:
"Ensure sufficient capacity for timely performance of the functions defined in these guidelines for national systems, including data collection for estimating anthropogenic GHG emissions by sources and removals by sinks and arrangements for technical competence of the staff involved in the inventory development process;"
and
"Collect sufficient activity data, process information and emission factors as are necessary to support the methods selected for estimating anthropogenic GHG emissions by sources and removals by sinks;"
In this respect the ERT notes that Ukraine over the last few years has not been able to collect the necessary activity data, process information and emission factors to estimate the relevant GHG emissions by sources and removals by sinks as applicable. The ERT further notes that Ukraine has consistently, in past and its current NIR, presented plans to estimate missing GHG emissions which have not been materialized in its 2010 submission.

16. The list of potential problems identified by ERT provided to Ukraine under paragraph 73 of the annex to decision 22/CMP.1 did not mention or make reference to paragraphs 10 (d), 14 (b), 16 (b), 16 (c) of the annex to decision 19/CMP.1 mentioned under the heading 'Questions of Implementation' in paragraph 185 of the final annual review report of Ukraine's 2010 inventory submission and referred to as part of the scope of the questions of implementation by the ERT. Contrary to the provisions of paragraphs 8 and 74 of the annex to decision 22/CMP.1, Ukraine was not given opportunity to comment on these questions or correct them.

17. Ukraine, therefore, requests the Compliance Committee to limit the consideration of questions of implementation raised in the final annual review report of Ukraine's 2010 submission to issues listed in paragraph 12 above and paragraph 188 of the final annual review report.

18. The written submission of Ukraine to the Compliance Committee hence focuses on the issues listed in paragraph 12 above and paragraph 188 of the final annual review report.

III. The National Inventory System of Ukraine

Description of the legal and institutional framework for inventory preparation

19. The legal and institutional framework supporting the national inventory system of Ukraine is made up of a number of key regulatory documents issued by the President of Ukraine and the Cabinet of Ministers of Ukraine:

- Presidential Decree No. 1239/2005, of 12 September 2005, which defines the Ministry of Environmental Protection (MEP) as coordinator of activities aimed at meeting the obligations of Ukraine under the UN Framework Convention on Climate Change and its Kyoto Protocol.
- Resolution No. 554 of the Cabinet of Ministers of Ukraine, of 21 April 2006, which establishes procedures for the operation of the national system for estimating anthropogenic emissions and removals of greenhouse gases not controlled by the Montreal Protocol, and its objectives and functions.
- Resolution No. 468 of the Cabinet of Ministers of Ukraine, of 10 April 2006, which determines the institutional framework supporting the coordination of activities aimed at meeting the requirements of the UNFCCC and the Kyoto Protocol.

The legal and regulatory framework to meet the obligations of Ukraine under the UN Framework Convention on Climate Change and its Kyoto Protocol (in the part of a national inventory of anthropogenic emissions and removals of GHGs) is presented in Annex 6.1.1. of the National Inventory Report of Ukraine submitted to the UNFCCC on 8 June 2011.

20. To ensure robust institutional support for compliance with the obligations under the UNFCCC and the Kyoto Protocol, with the Resolution of the Cabinet of Ministers of Ukraine No. 612 of 4 April 2007, the Government of Ukraine established the National Environmental Investment Agency of Ukraine (NEIA). In 2010 as part of a wider government reform, the agency was renamed the State Environmental Investment Agency of Ukraine (SEIA) and is currently coordinated by the Cabinet of Ministers through the Minister of Environment and Natural Resources of Ukraine.

21. SEIA ensures the functioning of the national greenhouse gas inventory, in particular it oversees the preparation of the annual inventory and the management of the inventory system. It is designated as the national focal point and national compiler of the greenhouse gas inventory and acts as sole national body responsible for the national inventory and its submission to the UNFCCC Secretariat. The tasks that SEIA carries out include:

- planning of the inventory preparation, as provided for in Decision 19/CMP.1;
- defining and allocating specific responsibilities in the inventory development process, including the responsibilities associated with the choice of methodologies, collection of the primary data, particularly data on the activities of ministries, departments and other entities, processing and archiving information;
- overseeing and implementing quality control and quality assurance procedures.

Specific activities ensuring fulfilment of these tasks are outlined in the Order #58 of the NEIA of 24 October 2008 "Procedures for conducting the national inventory of anthropogenic emissions of greenhouse gases by sources and absorption by sinks".

22. As part of the planning of the inventory preparation, SEIA also considers ways to improve the functioning of the national system for estimating GHG emissions and removals and the quality of preparation of the annual greenhouse gas inventories.

23. In addition to the MEP and SEIA, a wide range of government bodies and academic institutions are involved in the preparation of the greenhouse gas inventory:

- Ministries of the Cabinet of Ministers of Ukraine,
- State Committees, the Regional State Administrations (RSA),
- National Academy of Sciences (NAS) of Ukraine;
- Scientific research institutes (SRI):
  - the Ukrainian Hydrometeorological Institute (UHMI),
  - the Ukrainian Research Institute of Forestry and Agroforestry,
  - the State Enterprise "Cherkassky Research Institute of Technological and Economic Information in the Chemical Industry" (NIITEKhIM),
- commercial organizations: Environmental (Green) Investments Fund (EGIF),
- independent experts and organizations,
- public and non-governmental organizations.

24. The work on the development of greenhouse gas inventory is funded from the State Fund for Environmental Protection of Ukraine and the proceeds from the sale of Assigned Amount Units (AAUs) under the Green Investment Scheme (GIS).

25. The graphical representation of institutional arrangements supporting greenhouse gas inventory preparation and more detailed information about the institutional data providers participating in the preparation of the inventory are presented in Figure 1 and Table 1 below.

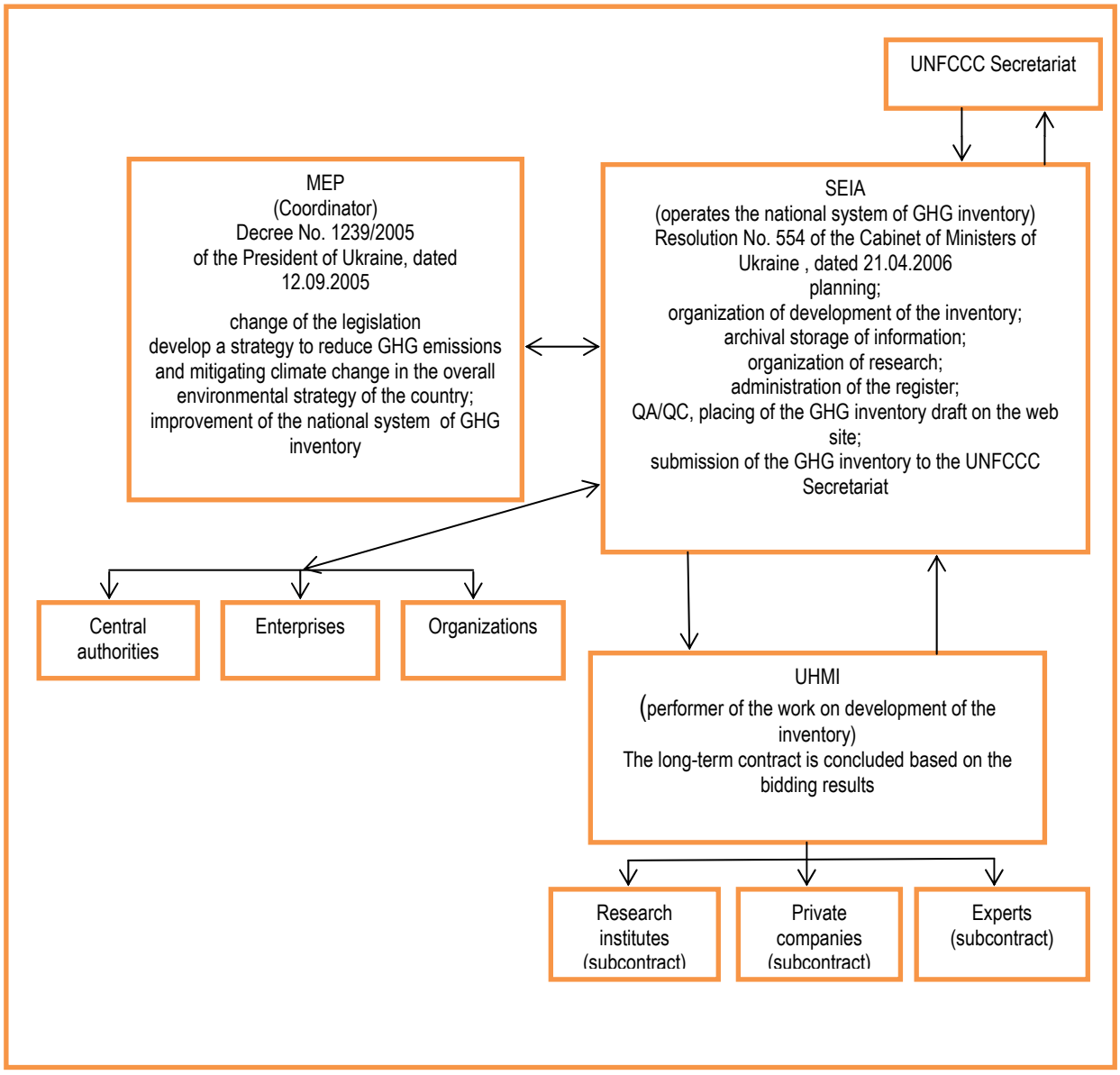


Figure 1. Institutional arrangements for GHG inventory preparation in Ukraine

Table 1. Institutional data providers participating in the preparation of GHG inventories in Ukraine.

Data provider	Description of provided activity data
State Statistics Committee of Ukraine	Amount of fuel consumed; The calorific value of basic fuels; Production volumes, imports, exports and changes in fuel stocks; Amounts of oil and natural gas transported through main oil and gas pipelines; Production, exports and imports of industrial products; The use of limestone for agriculture and for the production of sugar, soda and cement; Consumption of pig iron to produce steel; Number of animals by type and gender group in the public and private sectors; Consumption of feed to feed cows and breeding bulls of dairy herds and other cattle of agricultural enterprises and households across Ukraine and across regions; Milk production; Quantity of wool produced per sheep; Gross yield, yield capacity and total harvested area of crops; Amounts of nitrogen mineral and organic fertilizers introduced into soil; Grouping of enterprises by main indicators of livestock production; Area of felling in forestry (including fellings accordinf to their purpose by regions); Total and urban population; Information on total forest area and areas covered with forest vegetation in Ukraine; Amounts and area of application of nitrogen and organic fertilizers introduced into soil, by crop species; Total and urban population; Amount of waste of I-III hazard class of the food industry and agribusiness, placed in landfills; Average annual consumption of protein by the population of Ukraine.
Ministry of Fuel and Energy of Ukraine	The amount of fuel consumed by thermal power-stations and thermoelectric plants, as well as its calorific value; Production of oil and natural gas; Import / export of petroleum and petroleum products.
Ministry of Coal Industry of Ukraine	Production, import / export of coal.
Ministry of Industrial Policy of Ukraine	Production, export and import of industrial products; Data on the proportion of carbon in coke, conversion pig iron and steel.
Ministry of Agricultural Policy and Food	Information about the volume of activities for the period since 1990 that fall under paragraphs 3 and 4 of Article 3 of the Kyoto Protocol (to create a geobase of data for additional reporting under the Kyoto Protocol)
Ministry of Defense of Ukraine	Information about the volume of activities for the period since 1990 that fall under paragraphs 3 and 4 of Article 3 of the Kyoto Protocol (to create a geobase of data for additional reporting under the Kyoto Protocol)
The Ministry of Emergencies of Ukraine	Information about the volume of activities for the period since 1990 that fall under paragraphs 3 and 4 of Article 3 of the Kyoto Protocol (to create a geobase of data for additional reporting under the Kyoto Protocol) Data on annual average air temperature by regions and meteorological network stations of the State Committee for Hydrometeorology
Industrial enterprises	Ammonia and ferro-alloys production, as well as consumption of hydrofluorocarbons
Ministry of Construction, Architecture and Housing and Communal Services of Ukraine	Data on the amount of municipal solid waste disposed of in landfills; Data on volumes of waste household water; Information on the state of sanitation of settlements; Data on sewage management; Fuel combustion and communal services.
The State Committee of Ukraine for Water Management	Information on the volumes of wastewater subjected to local treatment, by branches of industries; Data on the area of cultivated peat soils
Ministry of Environmental Protection / State Departments of Ecology and Natural	Amounts and composition of waste incinerated at waste incineration plants in Ukraine;

Data provider	Description of provided activity data
Resources in oblasts	Data on the recovery of methane from landfills; Data on the morphological composition and density of the waste; Data on household wastewater. Information about the volume of activities for the period since 1990 that fall under paragraphs 3 and 4 of Article 3 of the Kyoto Protocol (to create a geobase of data for additional reporting under the Kyoto Protocol)
Ministry of Infrastructure	Information about the volume of activities for the period since 1990 that fall under paragraphs 3 and 4 of Article 3 of the Kyoto Protocol (to create a geobase of data for additional reporting under the Kyoto Protocol)
State Agency for Land Resources of Ukraine	Reported data on quantifiable land of Ukraine, including the report on land availability and distribution of land between land owners by types of land-use and economic activities; The Land Inventory of Ukraine.
The State Agency for Forest Resources of Ukraine	Information about the volume of activities for the period since 1990 that fall under paragraphs 3 and 4 of Article 3 of the Kyoto Protocol (to create a geobase of data for additional reporting under the Kyoto Protocol)
National University of Life and Environmental Sciences of Ukraine	The amount of excreted manure, the fraction of ash and nitrogen in dry matter of manure, by types, sex and age groups of cattle, pigs and poultry; Distribution of manure of cattle, swine and poultry per animal waste management systems; Data on the average live weight and daily gains and breeds composition of cattle; Data on the average live weight of sheep by breed and sex and age groups, herd structure, daily milk yields, energy nutrition value of milk, method of feeding, digestibility of feed and number of lambs per year from a single ewe; Data on the proportions of total nitrogen losses from manure storage in the liquid and solid forms
NSC “Institute of Agriculture UAAS”	Share values of nitrogen in aboveground crop residues; Data on losses of nitrogen due to volatilization as NH3 and NOx from the applied nitrogen fertilizers; Data on losses of nitrogen through leaching/runoff from fertilizers
The Council of Ministers of the Autonomous Republic of Crimea	Information about the volume of activities for the period since 1990 that fall under paragraphs 3 and 4 of Article 3 of the Kyoto Protocol (to create a geobase of data for additional reporting under the Kyoto Protocol)
Regional, Kiev and Sebastopol City Administrations	Information about the volume of activities for the period since 1990 that fall under paragraphs 3 and 4 of Article 3 of the Kyoto Protocol (to create a geobase of data for additional reporting under the Kyoto Protocol)

Expert capacity: Qualifications and Expertise of Inventory Preparers

26. From 2005, the annual greenhouse gas inventories were prepared by the Ukrainian Hydrometeorological Institute of the Ministry for Emergencies of Ukraine and NAS of Ukraine (UHMI) in cooperation with the Environmental (Green) Investments Fund (EGIF). The core team participating in the annual inventory submissions is comprised of 13 experienced well-qualified professionals, among them 5 PhD holders, who between them have on average over 5 years experience in GHG inventory preparation. Four of the inventory experts have successfully completed various UNFCCC GHG inventory training courses and are participating as reviewers in the reviews of the GHG inventories of Annex I countries. Brief summaries of track records and main qualifications of the core inventory team are presented in Table 2 below.

Table 2. Summaries of track records and main qualifications of the core inventory team

Sector	Expert	Qualifications/Experience
Energy	**Sergiy Skybyk**, EGIF	• Master's degree with a honors • Specialization: Heat and power engineering. • **Certificate of the UN Framework Convention on Climate Change**, confirming successful completion of courses: - National systems; - Application of adjustments; - Accounting of assigned amounts under Article 7, paragraph 4 of the Kyoto Protocol; - Review of the National registry. • **Certificate of the UN Framework Convention on Climate Change**, confirming successful completion of the UNFCCC Basic Course for the Review of Annex 1 Party Greenhouse Gas Inventories. • Professional experience since 2004 • Experience in GHG Inventory since 2008
	Oleksii Khabatiuk, SEIA	• Master's degree with a honors • Specialization: Thermal Physics. • Professional experience since 1998 • Experience in GHG Inventory since 2004
	Konstantin Tadlya, EGIF	• PhD, Thermal Physics • Professional experience since 1999 Experience in GHG Inventory since 2009
Industrial processes	**Georgiy Panchenko**, EGIF	• Ph.D, Power Distribution Systems • Diploma, Electrical engineer, electric supply of industrial enterprises, cities and agricultural sector • Certificate in the CIS Project Analysis of the Economic Development Institute of the World Bank • Certificate of the Argonne National Laboratory for successfully completed Training Course on Greenhouse Gas Mitigation Analysis of Energy Sector with use of the Energy And Power Evaluation Program • Professional experience since 1974 • Experience in GHG Inventory since 1998
	Olga Khabatyuk, EGIF	• Master's degree Specialization: Thermal Physics • Professional experience since 2002 • Experience in GHG Inventory since 2010
	Oleksandra Kolmogortseva, EGIF	• Master's degree Specialization: Hydrometeorology • Professional experience since 2008 • Experience in GHG Inventory since 2010
Agriculture	**Yuriy Pyrozhenko**, EGIF	• Master's degree • **Certificate of the UN Framework Convention on Climate Change**, confirming successful completion of the UNFCCC Basic Course for the Review of Annex 1 Party Greenhouse Gas Inventories. • **Certificate of the UN Framework Convention on Climate Change**, confirming successful completion of courses: - National systems; - Application of adjustments; - Modalities for the accounting of assigned amounts under Article 7 (paragraph 4), - Review of national registries and information on assigned amounts under the training program for members of expert review teams for the initial review under the guidelines for review under Article 8 of the Kyoto Protocol

		• Professional experience since 2002 • Experience in GHG Inventory since 2004
	Maria Bashtannik, UHMI	• Master's degree • Professional experience more than 20 years • Experience in GHG Inventory since 2004
LULUCF	**Oksana Butrym**, EGIF	• PhD • **Certificate of the UN Framework Convention on Climate Change**, confirming successful completion of the UNFCCC Basic Course for the Review of Annex 1 Party Greenhouse Gas Inventories. • **Certificate of the UN Framework Convention on Climate Change**, confirming successful completion of courses: - National systems; - Application of adjustments for lead reviewers; - Review of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol under the training programme for members of expert review teams for the initial review under guidelines for review under Article 8 of the Kyoto Protocol" • Professional experience since 1993 • Experience in GHG Inventory since 2000
	E.N.Kiptenko, UHMI	• Ph.D • Professional experience more than 20 years • Experience in GHG Inventory since 2004
	Tatiana Kozlenko, UHMI	• Master's degree • Professional experience more than 20 years • Experience in GHG Inventory since 2004
Waste sector	**Maryna Bereznytska**, EGIF	• Master's degree • **Certificate of the UN Framework Convention on Climate Change**, confirming successful completion of the UNFCCC Basic Course for the Review of Annex 1 Party Greenhouse Gas Inventories. • **Certificate of the UN Framework Convention on Climate Change**, confirming successful completion of courses: - National systems; - Application of adjustments; - Modalities for the accounting of assigned amounts under Article 7 (paragraph 4), - Review of national registries and information on assigned amounts under the training program for members of expert review teams for the initial review under the guidelines for review under Article 8 of the Kyoto Protocol • Professional experience since 1993 • Experience in GHG Inventory since 2004
QA/QC	**Yuriy Nabyvanets**, UHMI	• PhD • Professional experience more than 20 years • Experience in GHG Inventory since 2004

Quality Assurance and Quality Control

27. Implementing procedures for quality assurance and quality control (QA/QC) is part of the process of developing the greenhouse gas inventory. The QA/QC procedures implemented by Ukraine include QA/QC of the original data, emission factors and inventory results through an internal review. The emission estimates are analyzed for abnormal fluctuations in the time series and values of the indicators. The QA/QC of the inventory results is ensured through arrangements for examination of the key categories by leading experts from research and industry organizations in their respective sectors.

28. In addition, the preparation of the inventory includes:

- research on the development of national GHG emission factors for key categories;
- improvement of the methods of calculation based on the recommendations of the annual reviews and the results of national studies.

29. The preliminary version of the GHG inventory and CRF tables is made available on the website of SEIA for public organizations and all interested parties, and is sent to leading experts on GHG inventory for their comments and feedback, which can be provided within a month. After the GHG inventory has been revised in light of the received comments and recommendations, the final version of the inventory and CRF tables is sent to SEIA. SEIA carries out the final checks of the prepared GHG inventory and takes decision on submission of the final version of the GHG inventory and CRF tables to the UNFCCC Secretariat. SEIA is also the administrator of the national registry of carbon units in Ukraine.

Question of implementation

30. The list of potential problems identified by the ERT provided to Ukraine on 4 September 2010 under paragraph 73 of the annex to decision 22/CMP.1 on the issue of the performance of the national inventory system under potential problem #2 referred to paragraphs 10(b) and 14(c) of the annex to decision 19/CMP.1. Specifically, the ERT noted the following:

> *In accordance to Decision 19/CMP.1 paras. 10(b) and 14(c) of the Annex, each Party shall:*
> *"Ensure sufficient capacity for timely performance of the functions defined in these guidelines for national systems, including data collection for estimating anthropogenic GHG emissions by sources and removals by sinks and arrangements for technical competence of the staff involved in the inventory development process;"*
> *and*
> *"Collect sufficient activity data, process information and emission factors as are necessary to support the methods selected for estimating anthropogenic GHG emissions by sources and removals by sinks;"*
> *In this respect the ERT notes that Ukraine over the last few years has not been able to collect the necessary activity data, process information and emission factors to estimate the relevant GHG emissions by sources and removals by sinks as applicable. The ERT further notes that Ukraine has consistently, in past and its current NIR, presented plans to estimate missing GHG emissions which have not been materialized in its 2010 submission.*

31. Thus, in its outline of the potential problem, ERT identified two basic issues related to the functioning of the national inventory system: estimation of relevant GHG emissions and implementation of planned improvements.

32. In its response to the list of potential problems, Ukraine noted that as a result of economic crisis and limited public financing, the research activities aimed at supporting the national inventory system were not funded. However, Ukraine reported that it secured arrangements with the buyers of its Assigned Amount Units (AAUs) that allowed it to use a part of the proceeds from the sale of the AAUs to improve and support GHG inventory preparation.

Ukraine also provided specific list of improvements and additional research activities that were to be funded through this arrangement.

33. It might not have been clear from the original response, yet the arrangements that were mentioned in the response are stipulated in the actual AAU purchase contract with one of the buyers concluded in 2009 and were further integrated into Ukraine's domestic regulatory framework through Resolution # 671of the Cabinet of Ministers of Ukraine of July 28, 2010. The resolution specifies that up to 3 percent of the monetary proceeds from the executed purchase contract can be used for the needs of inventory preparation and improvement of the national GHG inventory system. Ukraine provided specific references to meetings and protocols approving the funding of the specific list of activities mentioned in paragraph 31 above.

34. While Ukraine's response focused on the achievement that Ukraine considered ground-breaking and paramount to providing financial security for the functioning of the national GHG system in the economically difficult and uncertain times for the country, it recognized that the original response provided to the ERT did not sufficiently cover the actual progress and improvements that have been made in the inventory preparations. On December 6, 2010 Ukraine provided additional extensive information about the progress and improvements achieved in the recent years.

GHG Inventory progress in 2007-2010 period

35. On 8 November 2007, Ukraine hosted an in-country review of the greenhouse gas inventory it submitted in 2006. The concluding ERT report stated: "Ukraine's GHG inventory is generally accurate, as defined in the Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories (hereinafter referred to as the UNFCCC reporting guidelines), and is consistent with the *Revised 1996 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines), the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance) and the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF). The 2006 inventory submission shows significant improvements on the major issues in all sectors, and covers all sectors and most categories." (FCCC/ARR/2006/UKR)

36. In subsequent years, despite the effects of the world's worst financial crisis in decades, which has had a very strong impact on Ukrainian economy and the financial health of the Ukrainian state, Ukraine continued the work on improving the quality of greenhouse gas inventories. Figure 2 below presents the number of improved categories in each annual inventory submission from 2007 to 2010. Furthermore, Annex A enclosed with this written submission describes in detail all improvements and developments that the inventory preparers have implemented since 2007 by years and categories.

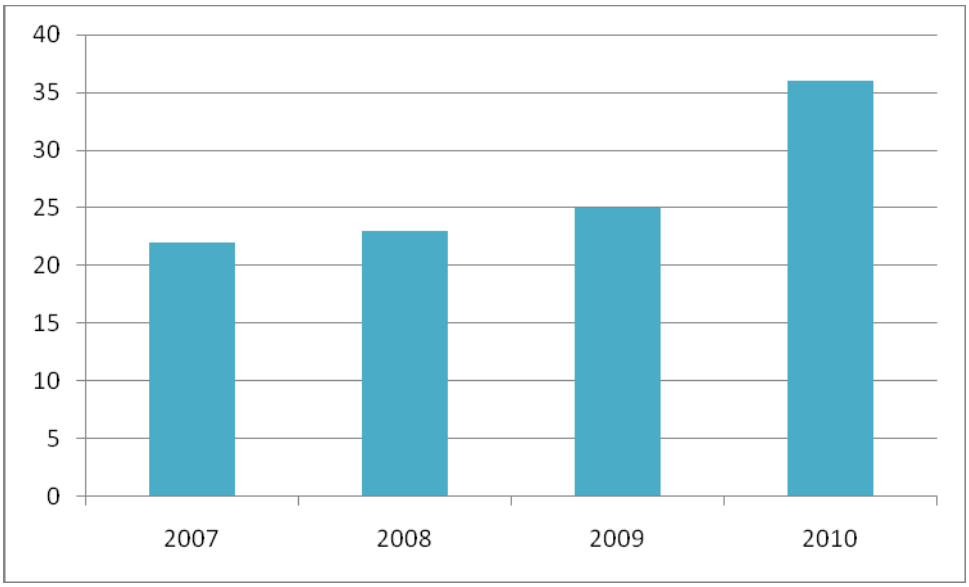


Figure 2.The number of improved categories in all sectors in GHG inventory submissions of Ukraine made in 2007-2010.

37. In February 2010, the ERT in its Report of the individual review of the annual submission of Ukraine submitted in 2009 confirmed that the national inventory system was functioning normally: "The ERT concluded that the Ukraine's national system continues to be in accordance with the requirements of national systems set out in decision 19/CMP.1." (FCCC/ARR/2009/UKR, paragraph 108).

Improvements made in the 2011 inventory submission

38. The process of the annual review of the national inventory submissions was intended by Parties to serve as a mechanism to assist them in improving their national inventories from year to year. To this end, the timeline of the review process was designed with the aim to provide sufficient time for the inventory preparers to react to the comments and recommendations of the expert review teams. Particularly, paragraph 75 of the annex to decision 22/CMP.1 states that

> *The expert review team shall prepare a draft individual inventory review report ... within eight weeks of the receipt of the comments on the questions posed and shall send the draft report to the Party concerned.*

On the issue of the conclusion of the review, paragraph 16 of the annex to decision 22/CMP.1 states

> *The annual review, including adjustment procedures as part of the review of the annual or base year inventory, shall be concluded within one year of the due date for submission of the information to be reported under Article 7, paragraph 1.*

39. Ukraine received the draft annual review report from the ERT on 15 March 2011, or 21 weeks after Ukraine provided its comments on the potential problems. This is 12 weeks longer than provided for in paragraph 75 of the annex to decision 22/CMP.1.

40. This significant deviation by the ERT from the timeline of the review determined by paragraphs 16 and 75 of the annex to decision 22/CMP.1 has put Ukraine into a difficult position with regards to incorporating the recommendations of the ERT in the 2011 inventory submission of Ukraine.

41. Nevertheless, despite the extremely short timeframe available to Ukraine to incorporate the recommendations of the ERT, Ukraine has been able to implement successfully majority of them. In total, in 2011 inventory submission of Ukraine, 107 recommendations and comments of the ERT were taken into consideration. In addition, Ukraine independently improved the estimation of GHG emissions in several categories, and provided additional information to facilitate the review of its inventory submission. Detailed information on the changes and improvements made in the 2011 inventory submission is provided in Annex B.

42. The ability of Ukraine's inventory system to react to ERT's recommendations within such short timeframe is the strongest evidence that national system of Ukraine continues to perform its functions fully and effectively.

Estimation of relevant GHG submissions

43. In the wording of the potential problems identified by ERT during the centralized review, ERT mentions that

> *Ukraine over the last few years has not been able to collect the necessary activity data, process information and emission factors to estimate the relevant GHG emissions by sources and removals by sinks as applicable*

Ukraine understands this to be reference to absence of estimates of emissions of HFCs, PFCs, SF_6 in category Consumption of Halocarbons and SF_6, on the basis of which the ERT recommended adjustments as a result of the 2010 annual inventory review.

44. In its response to the potential problems identified by ERT (Annex C), Ukraine testified that it is not a producer of HFCs, PFCs and SF6 and that the lack of activity data is preventing it from estimating the relevant emissions. It also mentioned that it plans to improve the estimation of emissions in this category in the shortest future. Furthermore in its response to the draft annual review report (Annex D), Ukraine explained to the ERT that while emissions in some of the subcategories in this category were successfully estimated in 2011 inventory submission, it was impossible to estimate emissions in other subcategories of this category on the basis of local data due to the national circumstances. The ERT did not accept this response.

45. Ukraine has accepted the adjustments recommended by the ERT for the lack of any better estimates. It will seek dialogue with ERT during the up-coming in-country review on how to further improve the way it handles emission estimates in the category, however Ukraine reaffirms that in some of the subcategories of the category Consumption of Halocarbons and SF6, no amount of effort that the inventory preparers can put into finding the data locally would make it possible to estimate the relevant emissions.

46. Ukraine would like to draw the attention of Compliance Committeeto the fact that Ukraine is not unique in not estimating some of the emission sources. Within the framework of the 2010 national inventory submissions, the number of emission sources not estimated by Ukraine was comparable to the number of sources not estimated in other countries. Table 3 below provides information on completeness of the Parties' submissions in 2010, quantifying the number of emission subcategories that were not estimated (notation 'NE') on the basis of their CRF submissions.

47. Most importantly, in the 2011 inventory submission, Ukraine has reduced the number of not-estimated emissions sources from 295 to 72, of them 19 emissions sources were estimated despite the lack of applicable IPCC methodologies, which clearly demonstrates Ukraine's ability collect the necessary activity data, process information and emission factors to estimate the relevant GHG emissions by sources and removals by sinks.

Table 3 – Completeness of 2010 inventory submissions of selected Annex I Parties.
Based on CRF submissions of relevant Parites, TABLE 9(a) "Completeness - information on notation keys".

Country	Quantity of NE notation keys	Explanation provided
United States of America	324	
Ukraine	295	
Netherlands	289	No data available
Denmark	263	
Estonia	240	Due to lack of activity data, the estimation has not been carried out
Latvia	236	
Belarus	227	There are no available data
Iceland	206	
Canada	203	
New Zealand	200	
Russian Federation	195	

National circumstances and the timing of GHG inventory improvements

48. In its assessment that the national inventory system of Ukraine does not fully fulfill its general and specific functions, the ERT mainly relies on assumption that Ukraine's slow response to recommendations from the ERT is an indication of inadequate functioning of the Ukraine's national inventory system and that no work has been ongoing because the results have not been made available in the 2010 submission:

> *The ERT further notes that Ukraine has consistently, in past and its current NIR, presented plans to estimate missing GHG emissions which have not been materialized in its 2010 submission.*

These assumptions are incorrect.

49. Any national inventory system is dynamic and cannot be perfect by default. As evidenced by the mandatory section "Planned improvements" in the inventory submission template, virtually any country preparing GHG inventories is planning and implementing improvements of its GHG inventory, as does Ukraine. The improvements made by Ukraine in years 2007-2010 are presented in Annex A.

50. Furthermore, Ukraine draws attention of the Compliance Committee to the improvements made in its 2011 inventory submission, which are detailed in Annex B. In total, 107 recommendations and comments of the ERT were taken into consideration. In addition, Ukraine independently improved the estimation of GHG emissions in some of the reported categories, and provided additional information to facilitate the review of its inventory submission. These dramatic improvements would not have been possible without the preparatory work that has been ongoing in 2008 - 2010.

51. Addressing past issues and recommendations of the ERT regarding improvements in the national GHG inventory was an activity that involved the collection and processing of new statistical information as well as ensuring the availability of data for all years since 1990. This is a task that took both time and resources and could not have been achieved without the cooperation between a number of national organizations and experts. This has been the focus of our work over the last few years in our sustained efforts to improve our national system and to ensure that it complies with the requirements in the annex to decision 19/CMP.1.

52. By taking the time necessary to ensure the implementation of recommendations of the ERT, Ukraine has been in compliance with the provisions of the CMP guidance and guidelines while ensuring that the improvements have been done in the most responsible, cost-effective and efficient manner possible.

53. While Ukraine recognizes that the way it has dealt with improvements in its inventory may have been different from the way other countries improve their inventories, this is the flexibility awarded to the Parties by the Article 10 of Kyoto Protocol:

> *All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, … shall:*
> *(a) Formulate, where relevant and to the extent possible, cost-effective national and, where appropriate, regional programmes to improve the quality of local emission factors, activity data and/or models which reflect the socio-economic conditions of each Party for the preparation and periodic updating of national inventories of anthropogenic emissions by sources and removals by sinks…*

as well as by the 2000 Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories:

> *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.*

54. As a country undergoing the process of transition to a market economy, Ukraine, like other countries in the region, has faced certain technical, institutional and organizational barriers which explain why data collection and research activities aimed at improvement of the national inventory submissions have experienced issues with full and wstimely financing.

55. Ukraine draws the attention of the Compliance Committee to the fact that the GDP per capita in Ukraine is not only the lowest among all countries of Annex I but is also significantly lower than the per capita GDP in many countries not included in Annex I (see Fig. 2 and 3). Overall, on the GDP per capita indicator, Ukraine is ranked 102th among 183 countries in the world.

56. Disregard for the national circumstances of the individual countries contradicts the letter and the spirit of the Kyoto Protocol. Moreover, it puts disproportionate emphasis on the issues related to the functioning of the national GHG inventory systems in poorest Annex I countries such as Bulgaria, Romania, and Ukraine.

57. While Ukraine fully and unreservedly accepts its responsibility to continually improve and update its annual inventory submissions, it stresses the importance of recognition of the Parties' national circumstances in assessment of their abilities and relative performance.

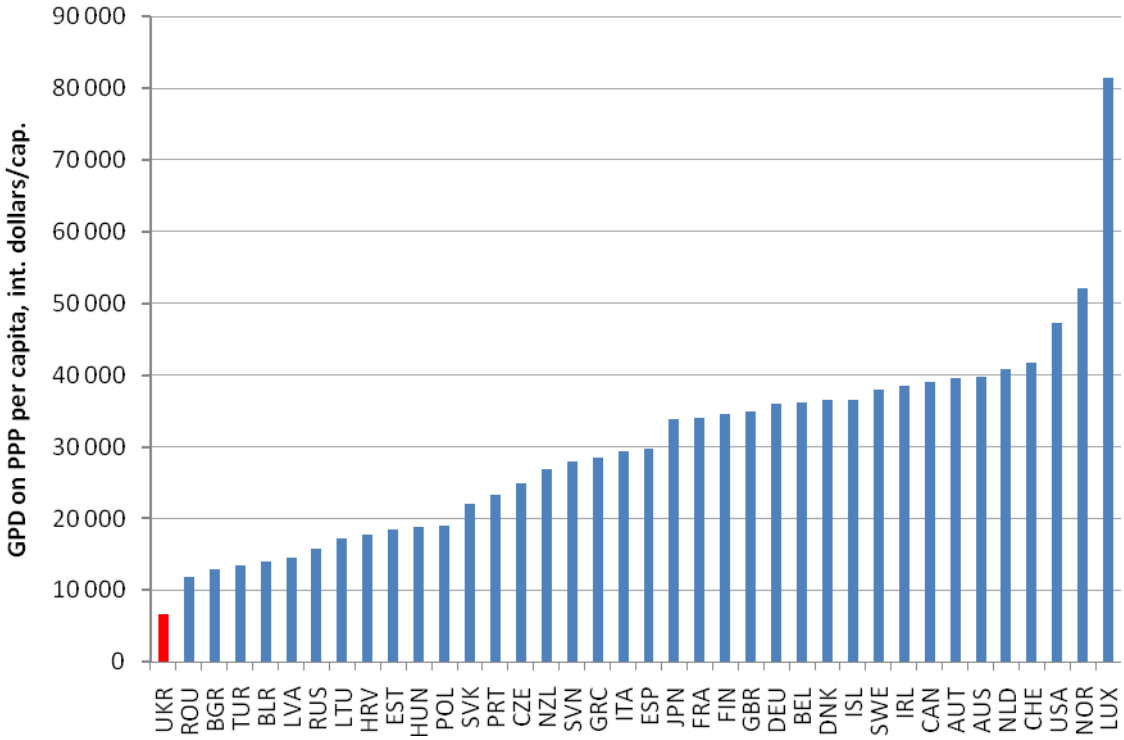


Figure 3. Per capita GDP in Annex I Parties that also parties to the Kyoto Protocol.[†]

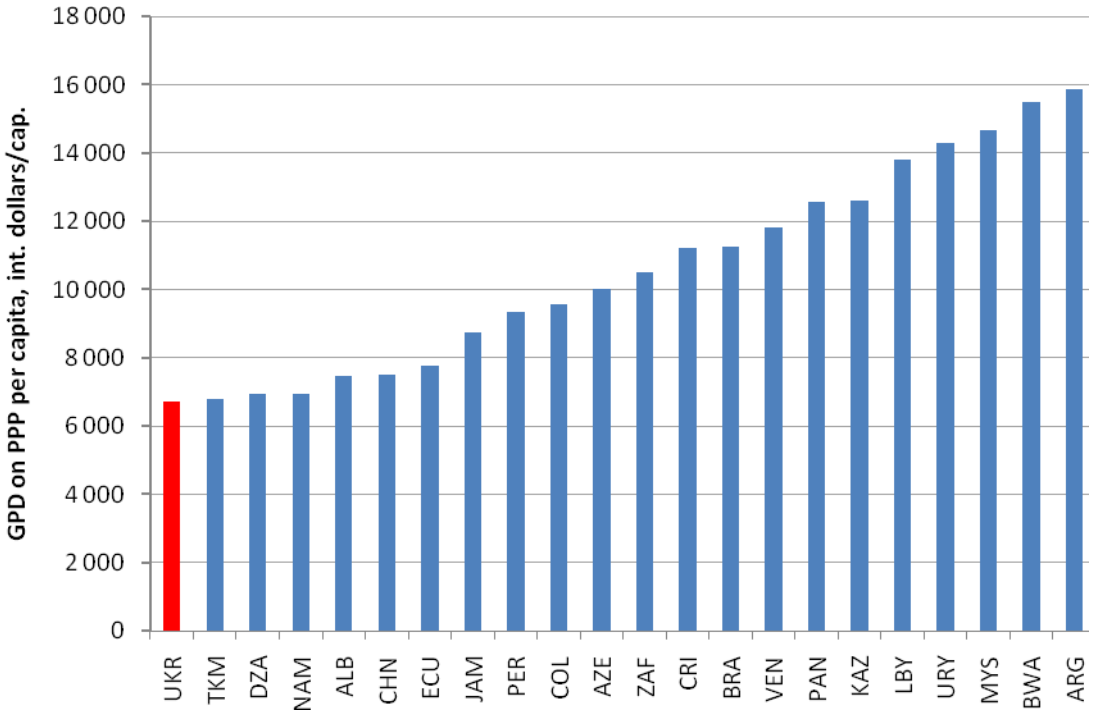


Figure 4. Per capita GDP in some of the non-Annex I countries and Ukraine.[‡]

[†] International Monetary Fund, World Economic Outlook Database, April 2011
[‡] International Monetary Fund, World Economic Outlook Database, April 2011

IV. Reporting of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

58. In the final annual review report of Ukraine's 2010 inventory submission, the ERT concluded from the information contained in the NIR, CRF tables and the additional information received during and after the centralized review that the Ukrainian national system is not able to ensure that areas of land subject to LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol are identifiable in accordance with paragraph 20 of annex to decision 16/CMP.1.

59. Ukraine, in its responses to the list of potential problems provided to the ERT on 17 October 17 2010 and in its responses to the draft annual review report of Ukraine's 2010 inventory submission, informed the ERT that it was undertaking activities to create a GIS-based database to account for and estimate the emissions and removals resulting from LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol. The 2011 inventory submission of Ukraine presents the results of the development of this database with the status of April 2011.

60. The database fully complies with the requirements for identification of land areas in accordance with paragraph 20 of annex to decision 16/CMP.1. Approximately a third of the country's forests (3,3 million hectares) have been processed in the GIS database according to the accounting requirements of level 2 (detailed description for separate lands with the activity according to 3.3-3.4), the rest of the country's forests are estimated according to the requirements of level 1.

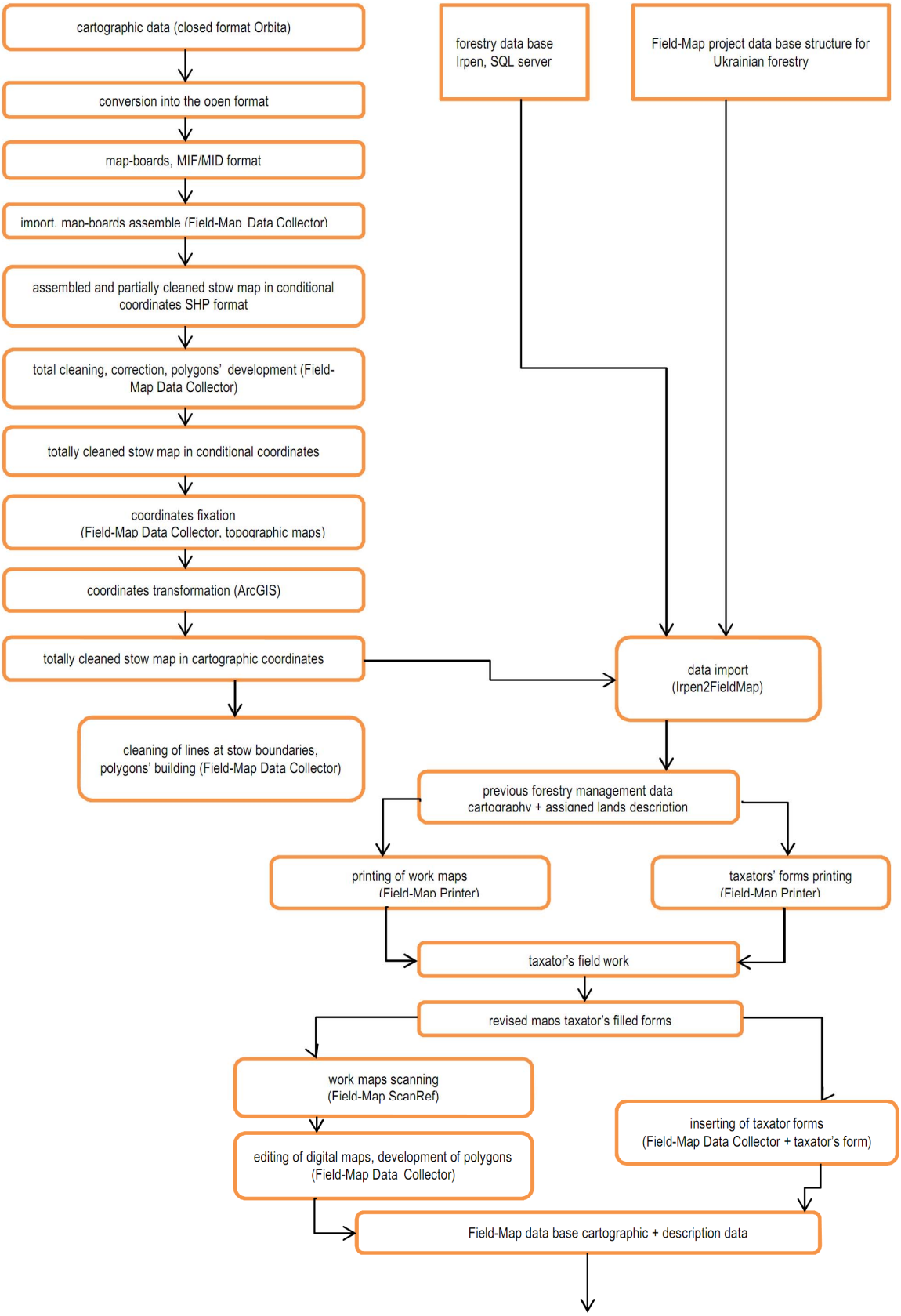
61. Table 4 below lists availability of georeferenced forest data by regions of Ukraine as of April 2011.

Table 4. Availability of georeferenced data by regions of Ukraine

ADMINISTRATIVE REGION	Area, hectares
Lugansk region	326269
Zhytomyr region	749729
Zakarpatska region	495772
Zaporizhiyaregion	66748
Kyiv region	319750
Kirovograd region	124458
Poltava region	126792
Rivne region	653407
Sumska region	140818
Kharkiv region	271461
Chernyhiv region	34398
TOTAL	**3309602**

62. Theoretical and practical work on the development the GIS forestry database is out in the Ukrainian Research Institute of Forestry and Forest Melioration named after G.M. Vysotsky. The Institute's specialists elaborated technologies for GIS application for forest

inventory on the basis of GE Small World GIS as the central forestry database server. In the framework of Czech-Ukrainian Project TechInLes, technology has been developed on the basis of Field-Map GIS to convert existing cartographic data in outdated formats into GIS-layers. The fields of GIS data base were filled by using the data from previous forestry management plans, printing out working maps and forest inventory sheets, and by adding new and revised data into the GIS data base.



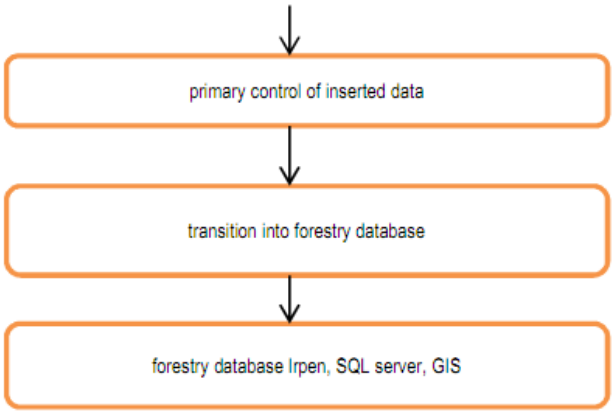


Figure 5. Forest GIS Scheme of Field-Map technology used in Ukraine

63. The National Forest Inventory Service (Production Association "Ukrderzhlisproekt") has elaborated the structure of relational database in Microsoft SQL environment- It is gradually filled in with the data accumulated in the object database. Cartographical data for around of 9,8 mln. ha have been inserted during many years into out-dated closed format "AIKS Lisgosp Orbita" but at present PA "Ukrderzhlisproekt" has started Field-Map software to convert these data into the open GIS format. The new datasets from field forest inventory are also placed to into the open GIS format.

64. Figures 6 – 12 provide examples of submitting information about LULUCF activity for the purpose of developing reporting under items 3.3-3.4 of Kyoto Protocol starting from cartographic illustration on the level of Ukraine as a whole (Figure 7) with further transmission to the bottom level for demonstration of the detailization of submitted information.

65. In the Field-Map database about afforestation and reforestation in the country (for all of 25 Ukrainian regions) data for the period 1990 – 2010 are collected for the State Forests Enterprises that belong to the State Agency of Forest Resources. As of March 2011 data base contains 213586 records on afforestation and artificial reforestation, among them 26192 records on afforestation, artificial reforestation – 187394 records (Figure 5). For 20-year period database contains information about afforestation on the area of 169452 hectares, artificial reforestation - 446825 hectares with cartographical reflection at the level of State Forests Enterprises.

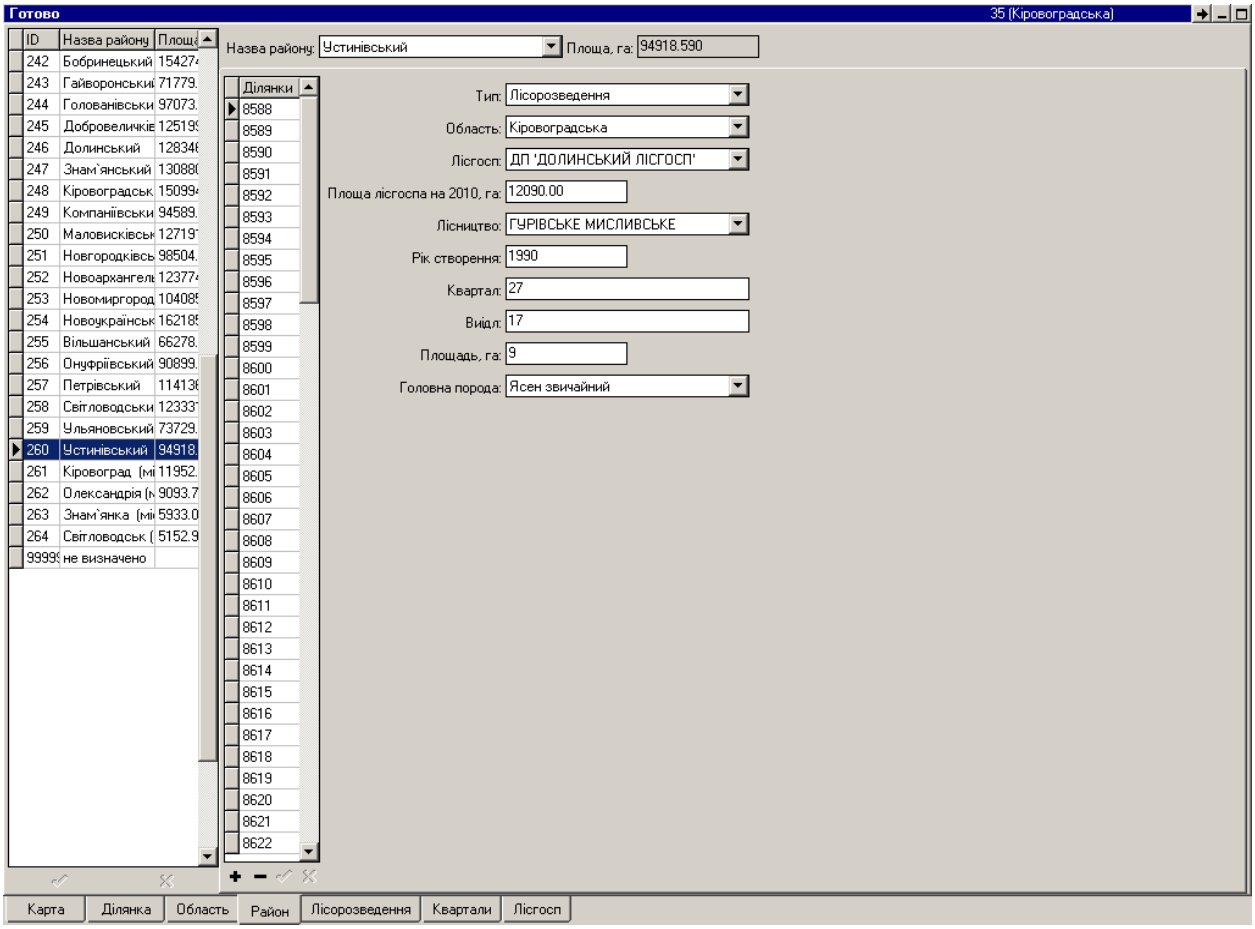
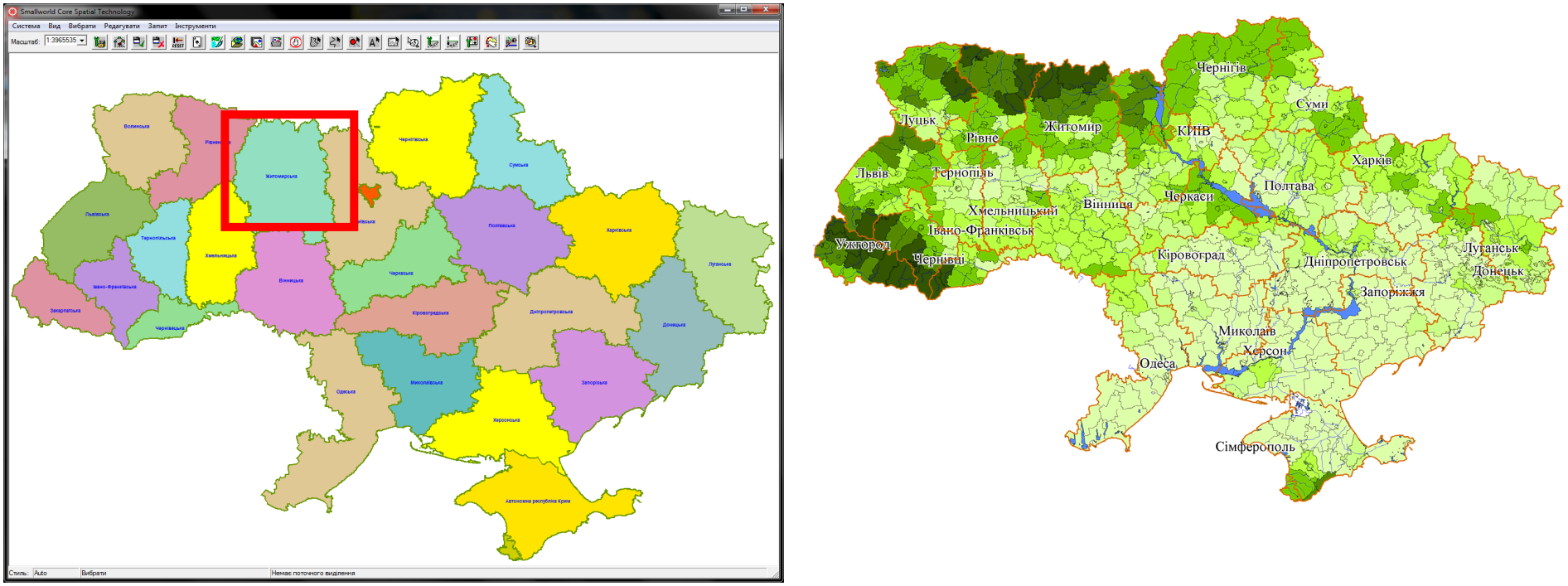
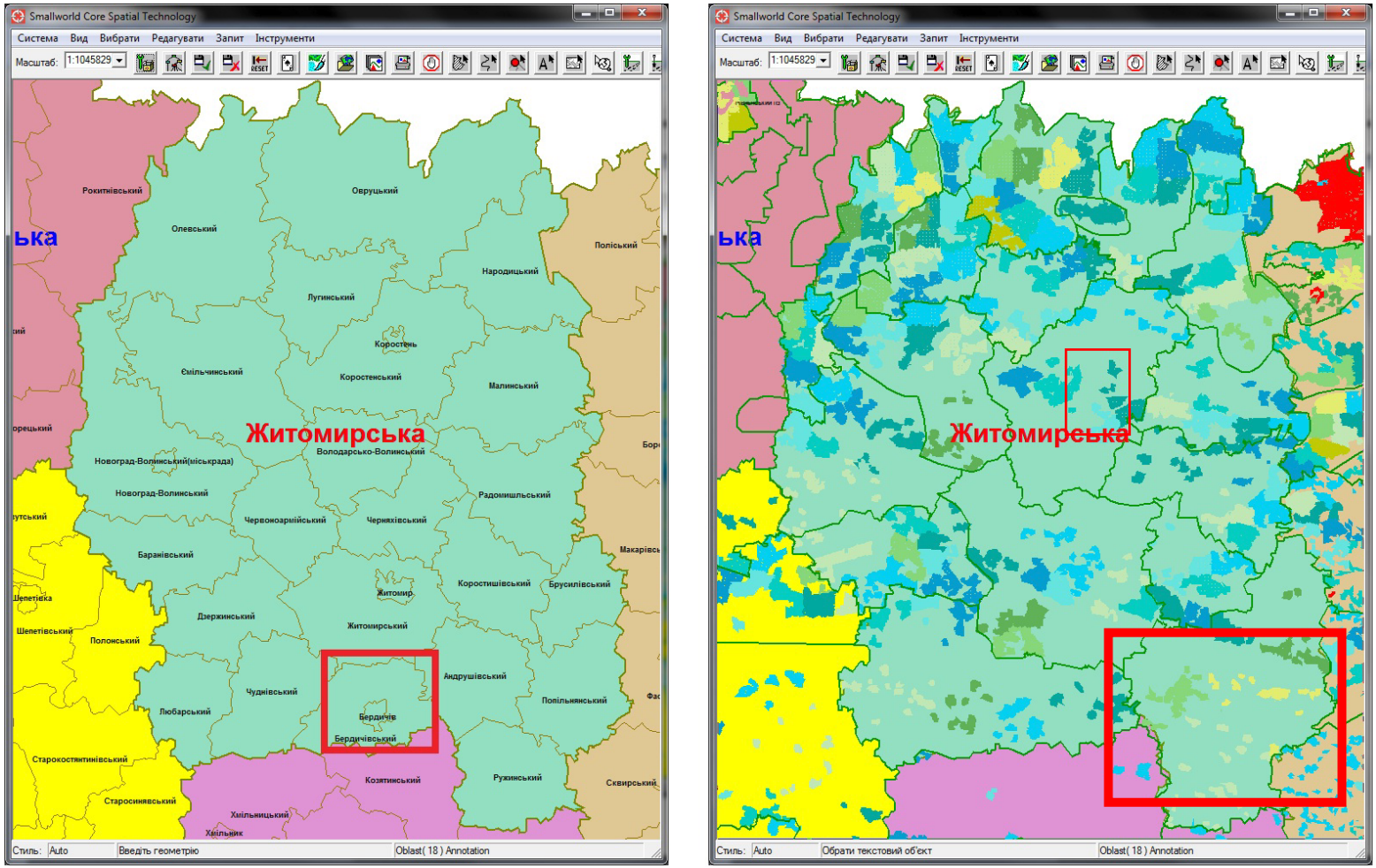


Figure 6. Example of Field-Map data base about afforestation and reforestation (1990-2010)



a) b)

Figure 7. Example of cartographical georeferenced data: a) administrative division of Ukraine; b) map of Ukrainian cover by administrative units.



a) b)

Figure 8. Example of GIS database support:
a) Zhytomyr region administration division; b) map of Zhytomyr region forests.

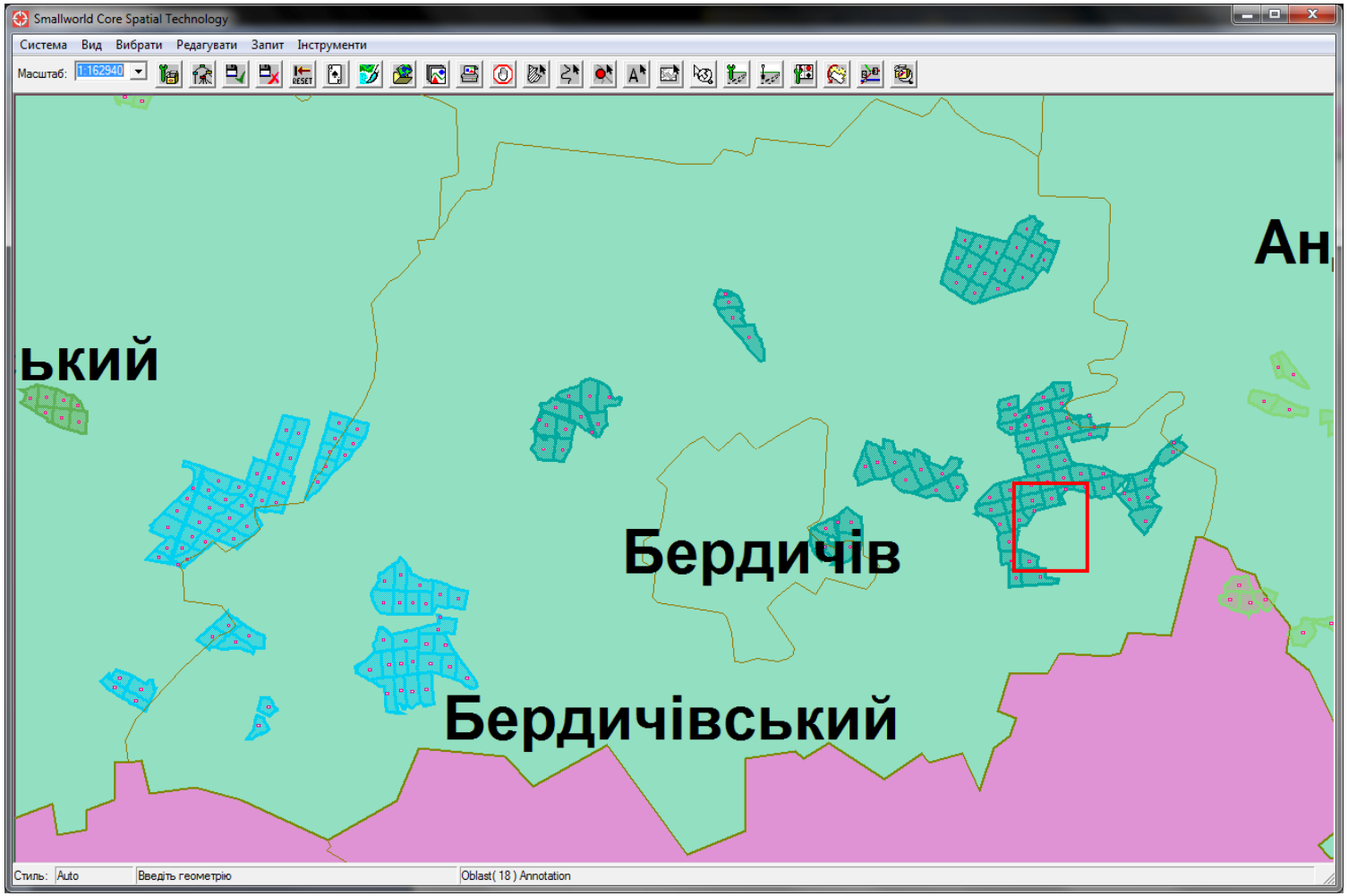


Figure 9. Example of GIS database support on the level of administration region.

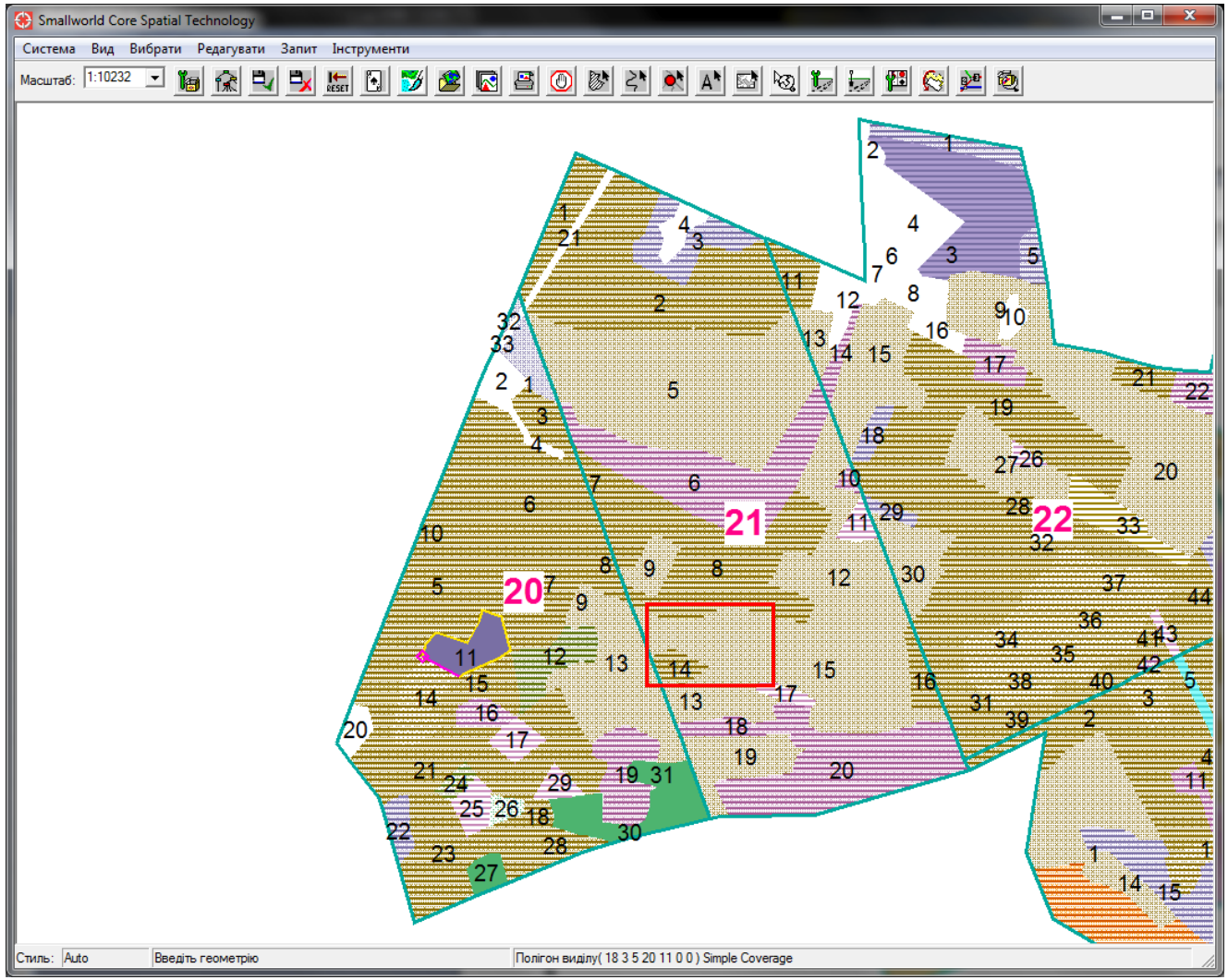


Figure 10. GIS database support on the level of forest compartments and sub-compartments.

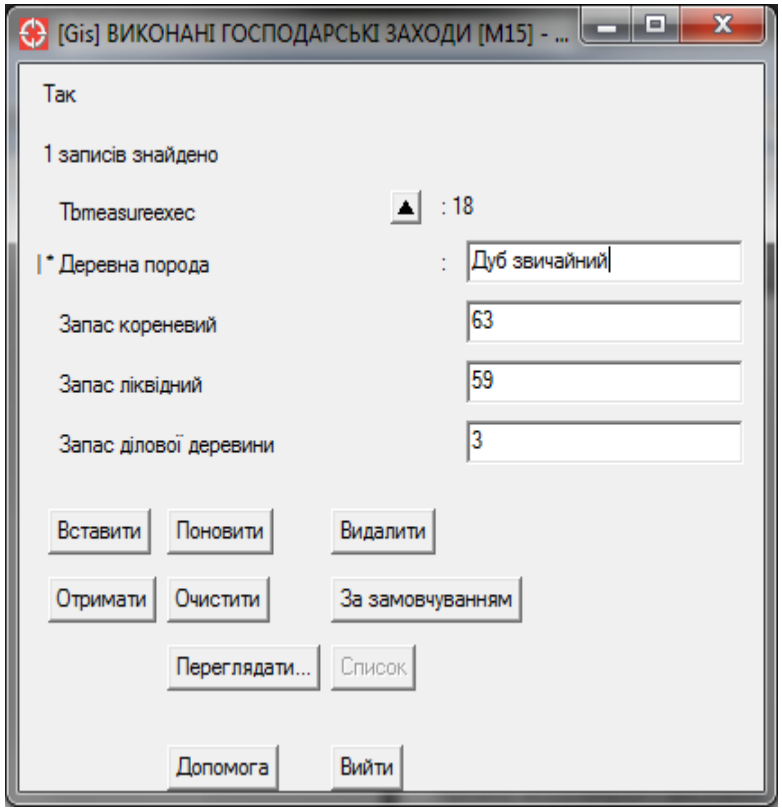
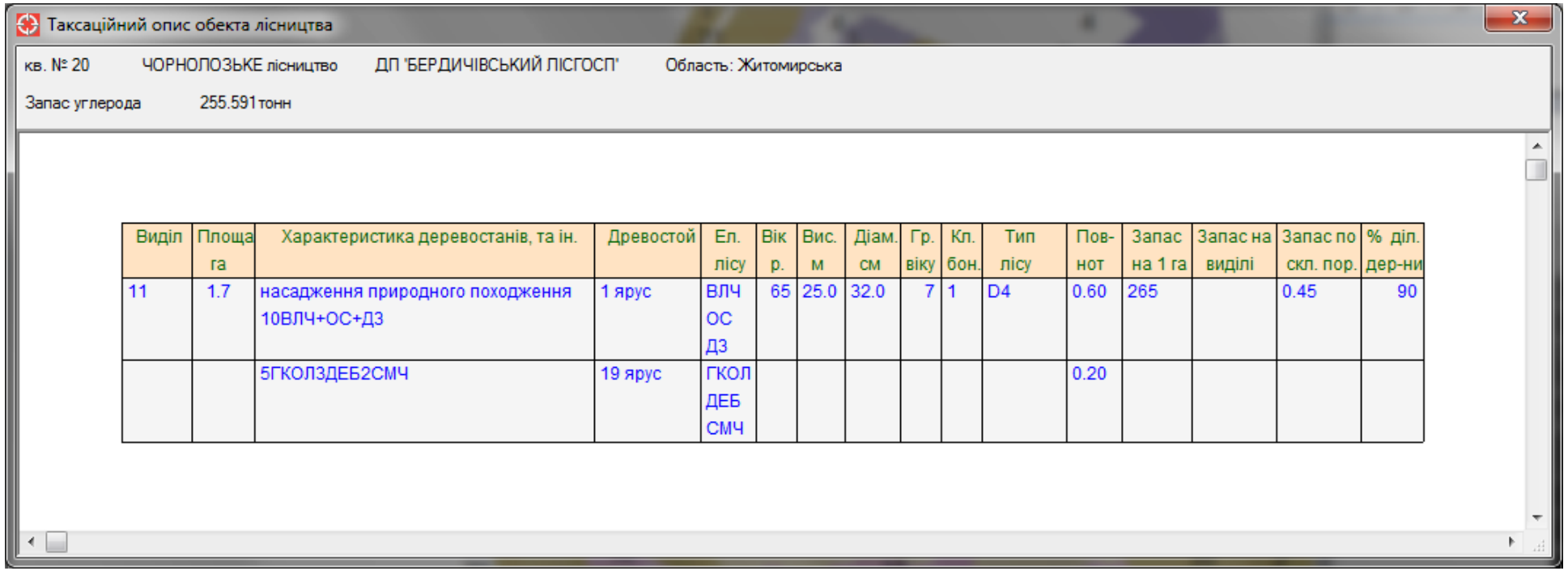


Figure 11. Example of GIS database: sample of information about growing stock on a forest plot.



Таксаційний опис обекта лісництва

кв. № 20 ЧОРНОЛОЗЬКЕ лісництво ДП "БЕРДИЧІВСЬКИЙ ЛІСГОСП" Область: Житомирська

Запас углерода 255.591 тонн

Виділ	Площа га	Характеристика деревостанів, та ін.	Древостой	Ел. лісу	Вік р.	Вис. м	Діам. см	Гр. віку	Кл. бон.	Тип лісу	Пов-нот	Запас на 1 га	Запас на виділі	Запас по скл. пор.	% діл. дер-ни
11	1.7	насадження природного походження 10ВЛЧ+ОС+ДЗ	1 ярус	ВЛЧ ОС ДЗ	65	25.0	32.0	7	1	D4	0.60	265		0.45	90
		5ГКОЛ3ДЕБ2СМЧ	19 ярус	ГКОЛ ДЕБ СМЧ							0.20				

Figure 12. Example of the taxation description of forest sub-compartment (the header of table indicates information about: Number of sub-compartment; Area hectares; Characteristics of stands, etc. Stands Forest elements; Age; Years; Height, Meters; Diameter, cm; Age group; Class of bonitet; Forest type; Density; Stock per 1 ha; Stock on sub-compartment; Stock according species; % industrial timber).

Conclusions

66. As a country undergoing the process of transition to a market economy, Ukraine has faced certain technical, institutional and organizational challenges in recent years. These challenges characterize the national circumstances and conditions of Ukraine. Various provisions of the Convention and its Kyoto Protocol, decisions of the COP and the CMP, the IPCC guidelines and the IPCC good practice guidance recognize the different national circumstances of all Parties and provide for flexibility on how to accommodate for them.

67. Ukraine emphasizes that it has successfully overcome the challenges it has experienced historically and has made substantial improvements in its 2011 GHG inventory submission, resolving the majority of the issues and recommendations included by the ERT in the 2010 annual inventory review report, including the issues covered by the scope of questions of implementation raised by the ERT.

68. During the preparation of the 2011 national GHG inventory submission, Ukraine demonstrated the capability of its national system to react to the comments and the recommendations by expert review teams. In total, in 2011 inventory submission of Ukraine, 107 recommendations and comments of the ERT were taken into consideration. In addition, Ukraine independently improved the estimation of GHG emissions in several categories, and provided additional information to facilitate the review of its GHG inventory submission.

69. Since 2007, Ukraine has been developing a GIS-based database fully compliant with the requirements for identification of areas of land subject to LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol in accordance with paragraph 20 of annex to decision 16/CMP.1. The results of this work have been presented in the 2011 GHG inventory submission.

70. Ukraine recognizes that the focus of the annual review conducted in 2010 was the 2010 annual GHG inventory submission. At the same time it notes that the purpose of the review of national systems is, inter alia, the provision of the Compliance Committee with reliable information on national systems as stipulated by subparagraph c) of paragraph 96 of the Annex to Decision 22/CMP.1.

71. As a result of the review taking longer than provided for in the annex to decision 22/CMP.1, more than a year has passed since the start of the review. The information presented by ERT in the final annual review report no longer corresponds to the actual state of affairs in the national system of Ukraine.

72. Ukraine further notes that the Conclusions and recommendations of the Seventh meeting of inventory lead reviewers (Bonn, Germany, 10-12 March 2010), states that "detailed review of the national system can be undertaken only through an in-country review".[4]

73. According to paragraph 99 of the annex to decision 22/CMP.1, "based on any findings during the individual inventory review and on findings relating to reported changes in national systems considered by the expert review team to be

[4] http://unfccc.int/files/national_reports/annex_i_ghg_inventories/review_process/application/pdf/con_rec7.pdf

potentially significant in relation to an identified problem in the inventory of the Party included in Annex I, the expert review team may request an additional country visit to review the relevant components of the national system in conjunction with an in-country inventory review."

74. In this context, Ukraine proposes, in accordance with paragraph 99 of the annex to decision 22/CMP.1 and recommendations adopted at the Seventh meeting of inventory lead reviewers, to conduct additional review of the national inventory system of Ukraine with the aim of examining the relevant components of the national system in connection with the review of the national GHG inventory of Ukraine.

75. Ukraine also informs the Compliance Committee that an in-country review of the 2011 inventory submission is scheduled to take place in Ukraine from 10 October to 15 October 2011, and invites to combine the additional review under paragraph 99 of the annex to decision 22/CMP.1 with the already scheduled review of the 2011 inventory submission.

76. Based on the above, Ukraine requests the Enforcement Branch of the Compliance Committee:

1) to determine not to proceed further with Questions of Implementation raised in the report of the individual review of the annual submission of Ukraine submitted in 2010 of 6 June 2011 (CC/ERT/ARR/2011/28) and Decision On Preliminary Examination (CC-2011-2-2/Ukraine/EB)

or *alternatively*

2) to defer the decision until the initial feedback from the scheduled in-country review of annual inventory of Ukraine submitted in 2011 is available, as provided for under paragraph 11, section IX, of the annex to decision 27/CMP.1

or *alternatively*

3) to refer the Questions of Implementation to the facilitative branch for consideration with the view to provide Ukraine advice and assistance taking into account is national conditions and specific circumstances as provided for by paragraph 12, section IX, Annex to Decision 27/CMP.1.

Annexes

Annex A: GHG Inventory improvements made by Ukraine during preparation of 2007 – 2010 annual submissions

No.	Category	Short description of the revision made in comparison with previous year's submission
2007		
1	1.A.3.a «Civil aviation»	Emissions from fuel combustion by International aviation were excluded from Civil aviation emissions.
2	1.B.1.a.1 «Coal mining and handling – Underground mines»	Methane emissions and volumes of recovered methane in 1990-2004 were refined.
3	1.B.2.B.iii «Natural Gas - Distribution»	The length of gas distribution system was refined for whole time series 1990-2004. So methane emissions in the category 1.B.2.B.3 «Natural Gas - Distribution» were recalculated.
4	1.B.2.B.ii «Natural Gas - Production» and 1.B.2.C.2.2 «Venting and Flaring – Natural Gas»	The volume of gas production in 2004 was refined. So methane emissions in the category 1.B.2.B.2 «Natural Gas - Production» and 1.B.2.C.2.2 «Venting and Flaring – Natural Gas» were recalculated.
5	1.C.1 «International Bunkers - Aviation»	Emissions from fuel combustion by International aviation were estimated first time.
6	2.B.1. "Ammonia Production"	The activity data were corrected consideration ERT comments.
7	4.A.1 "Cattle"	Tier 3 approach instead of Tier 2 for estimation of methane emissions for cattle enteric fermentation was used.
8	4.A.7 "Mules and Asses"	Methane emissions from mules and asses enteric fermentation were estimated for the first time.
9	4.B.1 "Cattle"	Inclusion of calves up to 1 year old in the subcategory «Other cattle». Weighted average values of volatile solid excretion rates were estimated for this subcategory.
10	4.B.7 "Mules and Asses"	Methane emissions from mules and asses manure management were estimated for the first time.
11	4.B.11 "Anaerobic lagoons"	Inclusion of calves up to 1 year old in the subcategory «Other cattle». Weighted average values of nitrogen excretion rates were estimated for this subcategory.
12	4.B.13 "Anaerobic lagoons"	Inclusion of calves up to 1 year old in the subcategory «Other cattle». Weighted average values of nitrogen excretion rates were estimated for this subcategory.
13	4.B.14 "Other AWMS"	Inclusion of calves up to 1 year old in the subcategory «Other cattle». Weighted average values of nitrogen excretion rates were estimated for this subcategory. Inclusion of mules and asses in GHG emissions estimation.
14	4.D.1.2 "Animal manure applied to soils"	Inclusion of calves up to 1 year old in the subcategory «Other cattle». Weighted average values of nitrogen excretion rates were estimated for this subcategory. Inclusion of mules and asses in GHG emissions estimation.
15	4.D.1.4 "Crop residue"	Correction of regression factors used for the calculation of N from residues of winter wheat and sugar beet; Use of regression factors and N fraction for rape on annual grasses (instead of peas) because they are biologically similar to rape.
16	4.D.2 "Pasture, Range and Paddock manure"	Inclusion of calves up to 1 year old in the subcategory «Other cattle». Weighted average values of nitrogen excretion rates were estimated for this subcategory. Inclusion of mules and asses in GHG emissions estimation.
17	4.D.3.1 "Atmospheric deposition"	Inclusion of calves up to 1 year old in the subcategory «Other cattle». Weighted average values of nitrogen excretion rates

No.	Category	Short description of the revision made in comparison with previous year's submission
		were estimated for this subcategory. Inclusion of mules and asses in GHG emissions estimation.
18	4.D.3.2 "Nitrogen leaching and run-off"	Inclusion of calves up to 1 year old in the subcategory «Other cattle». Weighted average values of nitrogen excretion rates were estimated for this subcategory. Inclusion of mules and asses in GHG emissions estimation.
19	6.A Solid Waste disposal on Land	Clarification of activity data, taking into account data on industrial wastes of agriculture and food industry, exported to MSW DS, application of some national data for refining of the emission factors
20	5. LULUCF	Improvement of IPCC Approach 2 used to determines area of Land-Use change categories.
21	5.B.1 "Cropland remaining Cropland"	Used Tier 2 for carbon stock change calculation for pool of mineral soils. Elaboration of data base of area for main types of Ukrainian soils per regions and climatic zone. This data base included information about the content of humus and carbon divided per the main agriculture plants (3 species) and information about coefficients of different types and intensity of human activity on agriculture soils.
22	5.C.1 "Grassland remaining Grassland"	Used Tier 2 for carbon stock change calculation for pool of mineral soils. Elaboration of data base of area for main types of Ukrainian soils per regions and climatic zone. This data base included information about the content of humus and carbon divided per the main agriculture plants (3 species) and information about coefficients of different types and intensity of human activity on agriculture soils.
2008		
1	1.A.3.b "Road Transportation"	Improvement of approach used to evaluate the consumption of motor fuels led to recalculation of emissions. Balance method applied in current inventory allowed better captures of emissions in this category and increased the overall accuracy of the emissions estimates.
2	1.A.3.a «Civil aviation»	Tier 3 method was applied in calculations.
3	1.A.3.e.i "Pipeline Transport"	Activity data were refined based on revised data for 1998-2005 obtained from "Ukrtransgaz" SE (the main operator of Ukrainian gas transmission system).
4	1.B.1.a «Coal mining and handling»	Methane emissions from surface and underground coal mining in 2005 were refined on the basis of updated data on the coal production.
5	1.B.2.B.iii «Natural Gas – Transmission»	Data on installed capacity of gas compressor units were refined that led to appropriate emissions recalculation.
6	1.C.1 «International Bunkers - Aviation»	Tier 3 method was applied for International aviation emissions estimation.
7	2.A.6. "Road Paving with Asphalt"	The NMVOC EF from Revised 1996 IPCC Guidelines was corrected.
8	4.A.1 "Cattle"	More precise average methane conversion rate value was utilized.
9	4.A.10 "Fur farming"	Methane emissions from fur animal's enteric fermentation were estimated for the first time.
10	4.A.10 "Rabbits"	Methane emissions from rabbit's enteric fermentation were estimated for the first time.
11	4.B.7 "Mules and asses"	More precise data about amount of mules and asses in 2005 were utilized.
12	4.B.8 "Swine"	Data about manure allocation per AWMS were revised for the period 1990-2005.
13	4.B.10 "Fur farming"	Methane emissions from fur animal's manure management were estimated for the first time.

No.	Category	Short description of the revision made in comparison with previous year's submission
14	4.B.10 “Rabbits”	Methane emissions from rabbit’s manure management were estimated for the first time.
15	4.B.11 “Anaerobic lagoons”	Data about swine manure allocation per AWMS were revised for the period 1990-2005.
16	4.B.12 “Liquid systems”	Data about swine manure allocation per AWMS were revised for the period 1990-2005.
17	4.B.13 “Solid storage and Dry lot”	Data about swine manure allocation per AWMS were revised for the period 1990-2005. Fur animals and rabbits were included in GHG Inventory for the first time.
18	4.B.14 “Other AWMS”	Data about swine manure allocation per AWMS were revised for the period 1990-2005. More precise data about amount of mules and asses in 2005 were utilized.
19	4.D.1.2 “Animal manure applied to soils”	Data about swine manure allocation per AWMS were revised for the period 1990-2005. Fur animals and rabbits were included in GHG Inventory for the first time. More precise data about amount of mules and asses in 2005 were utilized.
20	4.D.2 “Pasture, Range and Paddock Manure”	More precise data about amount of mules and asses in 2005 were utilized.
21	4.D.3.1 “Atmospheric deposition”	Correction of data about amount of synthetic fertilizers applied in 2005. Data about swine manure allocation per AWMS were revised for the period 1990-2005. Fur animals and rabbits were included in GHG Inventory for the first time. More precise data about amount of mules and asses in 2005 were utilized.
22	4.D.3.2 “Nitrogen leaching and run-off”	Correction of data about amount of synthetic fertilizers applied in 2005. Data about swine manure allocation per AWMS were revised for the period 1990-2005. Fur animals and rabbits were included in GHG Inventory for the first time. More precise data about amount of mules and asses in 2005 were utilized.
23	5.B.1 “Cropland remaining Cropland” 5.C.1 “Grassland remaining Grassland”	The nation methodology has been elaborated for assessment the carbon stock change for mineral soil pool. This methodology based on calculation of nitrogen balance flow with recalculation to carbon by using C:N relationship. This methodology has been used for preparing Ukrainian inventory report and previously passed testing with the official soils expert conclusions. Add to this method was published in monographs, scientific journals, conference proceedings. Method uses wide statistic base according: - harvesting all agriculture crops; - manure and nitrogen fertilization inputted under crops; - types of soils under different crops; - mechanic compositions of different soils; - nitrogen and humus content in different soils. Each of these statistic parameters indicated per administrative regions and climatic zone of Ukraine. Add to these our method uses wide scale national coefficients and different national circumstances according Ukrainian agriculture traditions, historical practice and other aspects.
2009		
1	1.C.1 «International Bunkers - Navigation» and 1.A.3.d «Navigation»	As a result of QC procedures, the methane emission factor, which has been used in the calculation of emissions from navigation for the entire time series, was corrected.
2	1.A «Stationary combustion», 1.B «Fugitive» and «International Bunkers -	Recalculations due to activity data refinement for 2006.

No.	Category	Short description of the revision made in comparison with previous year's submission
	Navigation»	
3	1.A.3.e.i "Pipeline Transport"	As a result of QC procedures, the N_2O emission factor, which has been used in the calculation of emissions from pipeline transport for the entire time series, was corrected.
4	1.A «Stationary combustion»	As a result of QC procedures, the CO_2 emission factor, which has been used in the calculation of emissions from biomass combustion, was corrected
5	2.B.1. "Ammonia Production"	The data on natural gas consumption for ammonia production were obtained from enterprises.
6	2.B.4.1. "Calcium Carbide Production"	The initial data were obtained from enterprises.
7	2.C.2. "Ferroalloys Production"	The research of national CO2 emission factors from the ferroalloys production was provided
8	2.F.1.a. "Consumption of Halocarbons in Refrigeration Equipment"	The hydrofluorocarbons inventory for emissions from production and use of household refrigerators and refrigeration equipment for autonomous commercial applications was provided.
9	4.A.3 "Sheep"	Tier 2 method instead of tier 1 for estimation of methane emissions from sheep enteric fermentation was applied.
10	4.A.7 "Mules and asses"	More precise data about amount of mules and asses for 2005-2006 were utilized.
11	4.B.7 "Mules and asses"	More precise data about amount of mules and asses for 2005-2006 were utilized.
12	4.B.11 "Anaerobic lagoons"	Data about swine manure allocation per AWMS were revised for the 2006.
13	4.B.13 "Solid storage and Dry lot"	Data about swine manure allocation per AWMS were revised for the 2006.
14	4.D.1.1 "Synthetic fertilizers"	Country-specific data about N losses in form of NH_3 and NO_x were used.
15	4.D.1.2 "Animal manure applied to soils"	Data about swine manure allocation per AWMS were revised for the 2006.
16	4.D.1.3 "N-fixing crops"	Shifting to country-specific methodology for estimation of GHG emissions from N-fixation.
17	4.D.1.4 "Crop residue"	Crops that previously were not considered in calculations are to be included in GHG Inventory. More precise data about amount of nitrogen in roots of soya and sorghum were applied.
18	4.D.1.5 "Cultivation of histosols"	More precise data about area of cultivated histosols were calculated.
19	4.D.2 "Pasture, Range and Paddock Manure"	More precise data about mules and asses population for 2005-2006 were applied.
20	4.D.3.1 "Atmospheric deposition"	Country-specific data about N losses from synthetic fertilizers in form of NH_3 and NO_x were used. More precise data about mules and asses population for 2005-2006 were applied. Data about swine manure allocation per AWMS were revised for the 2006.
21	4.D.3.2 "Nitrogen leaching and run-off"	Country-specific data about N losses as a result of leaching and run-off from synthetic fertilizers applied were used. More precise data about mules and asses population for 2005-2006 were applied. Data about swine manure allocation per AWMS were revised for the 2006.
22	4G "Indirect N_2O emissions from manure management"	GHG emissions in this category were accounted for the first time.
23	6.A Solid Waste disposal on Land	Uncertainty reduction in the category from 303% down to 107.1% due to the definition of national emission factors (did not lead to recalculations)

No.	Category	Short description of the revision made in comparison with previous year's submission
24	5. LULUCF	Refurbished statistic information about all areas of Land-Use Categories.
25	5B.1 “Cropland remaining Cropland” 5C.1“Grassland remaining Grassland”	Refurbished statistic information about total areas of Land-Use Category and about harvested areas. The crosscutting check conducted with comparing with area values which used in Agriculture Sector.
2010		
1	1.A.1.a “Public electricity and heat production”	Country specific oxidation factors for coal combustion at thermal power plants of Ukraine in 2006 – 2008 were developed. In result of their applying, emissions in category “Public electricity and heat production” in 2006-2007 were recalculated.
2	1.A.1.a “Public electricity and heat production”	Emissions from biogenic waste incineration were estimated first time.
3	1.A.3.b “Road Transportation”, 1.B.2.b.iii «Natural Gas - Transmission» and 1.B.2.b.iv «Natural Gas - Distribution»	Recalculations due to activity data refinement for 2007.
4	1.B.2.b.iii «Natural Gas – Transmission» and 1.B.2.c. Venting - ii. Gas	Pursuant to the recommendations of the ERT regarding separation of emissions from natural gas transmission between the Fugitive and Venting (the categories 1.B.2.b. Natural Gas - iii. Transmission and 1.B.2.c. Venting - ii. Gas, respectively) Ukraine, in response on list of potential problems, conducted the allocation of data about emissions presented in the official submission in the category 1.B.2.b. Natural Gas - iii Transmission per categories 1.B.2.b. Natural Gas - iii. Transmission and 1.B.2.c. Venting - ii. Gas.
5	2.B.2. “Adipic Acid Production”	The quality control of inventory was carried out with one of the leading Ukrainian specialists in this field involved who did not participate in inventory preparation.
6	2.B.2. “Nitric Acid Production”	The quality control of inventory was carried out with one of the leading Ukrainian specialists in this field involved who did not participate in inventory preparation.
7	2.B.4.1. “Silicon Carbide Production”	The initial data were obtained from enterprises.
8	2.C.1. “Iron and Steel Production”	CO2 emission recalculations in this category were performed due to the adjustment of data on carbon content in coke, iron and steel.
9	2.C.2. “Ferroalloys Production”	The quality control of inventory was carried out with one of the leading Ukrainian specialists in this field involved who did not participate in inventory preparation.
10	2.A.3. “Limestone and Dolomite Use”	Limestone production and use balance of Ukraine was developed.
11	4.A.1 “Cattle”	Average annual data about livestock population instead of statistical data as of 1 January of each year were used. More precise statistical data about cattle heads for 2004 and 2007 were applied (use of final data instead of tentative values). Statistical data about feed consumption for cattle in 2005-2006 were corrected. More accurate data about average live-weight and amount of feed consumed for fattening cattle and breeding bulls were utilized.
12	4.A.3 “Sheep”	Data about milk yields were corrected. More accurate data about feeding situation were applied.
13	4.A.10 “Fur farming”	More precise emission factors were used.
14	4.A.10 “Rabbits”	More precise emission factors were used.

No.	Category	Short description of the revision made in comparison with previous year's submission
15	4.B.1 “Cattle”	Average annual data about livestock population instead of statistical data as of 1 January of each year were used. More precise statistical data about cattle heads for 2004 and 2007 were applied (use of final data instead of tentative values).
16	4.B.3 “Sheep”	Average annual data about livestock population instead of statistical data as of 1 January of each year were used. Country-specific data about manure allocation per AWMS were applied.
17	4.B.4 “Goats”	Average annual data about livestock population instead of statistical data as of 1 January of each year were used. Country-specific data about manure allocation per AWMS were applied.
18	4.B.6 “Horses”	Average annual data about livestock population instead of statistical data as of 1 January of each year were used. Country-specific data about manure allocation per AWMS were applied.
19	4.B.8 “Swine”	Average annual data about livestock population instead of statistical data as of 1 January of each year were used.
20	4.B.9 “Poultry”	Average annual data about livestock population instead of statistical data as of 1 January of each year were used.
21	4.B.10 “Rabbits”	Average annual data about livestock population instead of statistical data as of 1 January of each year were used.
22	4.B.10 “Fur farming”	Average annual data about livestock population instead of statistical data as of 1 January of each year were used.
23	4.B.11 “Anaerobic lagoons”	Average annual data about livestock population instead of statistical data as of 1 January of each year were used. More precise statistical data about cattle heads for 2004 and 2007 were applied (use of final data instead of tentative values).
24	4.B.12 “Liquid systems”	Average annual data about livestock population instead of statistical data as of 1 January of each year were used.
25	4.B.13 “Solid storage and Dry lot”	Average annual data about livestock population instead of statistical data as of 1 January of each year were used. More precise statistical data about cattle heads for 2004 and 2007 were applied (use of final data instead of tentative values). Country-specific data about sheep, goats and horses manure allocation per AWMS were applied. Correction of nitrogen excretion rates with manure of rabbits and fur animals.
26	4.B.14 “Other AWMS”	Average annual data about livestock population instead of statistical data as of 1 January of each year were used. Country-specific data about sheep, goats and horses manure allocation per AWMS were applied.
27	4.D.1.2 “Animal manure applied to soils”	Average annual data about livestock population instead of statistical data as of 1 January of each year were used. More precise statistical data about cattle heads for 2004 and 2007 were applied (use of final data instead of tentative values). Country-specific data about sheep, goats and horses manure allocation per AWMS were applied. Correction of nitrogen excretion rates with manure of rabbits and fur animals. Correction of data about N losses in result of manure storage per AWMS and its application to soils.
28	4.D.1.3 “N-fixing crops”	Allocation of GHG emissions from N-fixation to category 4.D.1.4 “Crop residue”.
29	4.D.1.4 “Crop residue”	More precise data about harvested areas and crop yields for a number of crops were utilized. Inclusion of additional amount of nitrogen that returned to soils with sideline products of some crops.
30	4.D.1.5 “Cultivation of	Usage of more reliable data (in the view of scope

No.	Category	Short description of the revision made in comparison with previous year's submission
	histosols"	completeness) about cultivated area.
31	4.D.2 "Pasture, Range and Paddock Manure"	Average annual data about livestock population instead of statistical data as of 1 January of each year were used. More precise statistical data about cattle heads for 2004 and 2007 were applied (use of final data instead of tentative values). Country-specific data about sheep, goats and horses manure allocation per AWMS were applied. Correction of nitrogen excretion rates with manure of rabbits and fur animals.
32	4.D.3.1 "Atmospheric deposition"	Average annual data about livestock population instead of statistical data as of 1 January of each year were used. More precise statistical data about cattle heads for 2004 and 2007 were applied (use of final data instead of tentative values). Country-specific data about sheep, goats and horses manure allocation per AWMS were applied. Correction of nitrogen excretion rates with manure of rabbits and fur animals. Correction of data about N losses in result of manure storage per AWMS and its application to soils.
33	4.D.3.2 "Nitrogen leaching and run-off"	Average annual data about livestock population instead of statistical data as of 1 January of each year were used. More precise statistical data about cattle heads for 2004 and 2007 were applied (use of final data instead of tentative values). Country-specific data about sheep, goats and horses manure allocation per AWMS were applied. Correction of nitrogen excretion rates with manure of rabbits and fur animals. Correction of data about N losses in result of manure storage per AWMS and its application to soils.
34	4G "Indirect N_2O emissions from manure management"	Average annual data about livestock population instead of statistical data as of 1 January of each year were used. More precise statistical data about cattle heads for 2004 and 2007 were applied (use of final data instead of tentative values). Country-specific data about sheep, goats and horses manure allocation per AWMS were applied. Correction of nitrogen excretion rates with manure of rabbits and fur animals as well as N losses in form of NH_3 and NO_x from livestock manure.
35	6.A Solid Waste disposal on Land	In 2008 the expert opinion was received with a refinement of MCF values for Ukraine for 2005-2008 periods. The values were based on new data obtained during field investigations at the MSWDS of Ukraine
36	5. LULUCF	The detailed data base used for area all of Categories. The information was used per regions opposed to total value of Ukrainian land-Use Categories. So, detailed matrixes for land-use transition were elaborated for all regions (25).

Annex B: GHG Inventory improvements made by Ukraine during preparation of 2011 annual submission

#	Para in ARR2010	Recommendation character	Sector	Category	Brief description of the ERT recommendation/notification	Corrected in Ukrainian submission 2011
1	12	STR REC	Energy	1B2A	The ERT noted that categories reported by Ukraine as "NE" include: fugitive CO2 and CH4 emissions from oil exploration (and, when relevant, N2O emissions)	Yes
2	12	STR REC	Energy	1B2A	The ERT noted that categories reported by Ukraine as "NE" include: CO2 emissions from oil production	Yes
3	12	STR REC	Energy	1B2A	The ERT noted that categories reported by Ukraine as "NE" include: CO2 and CH4 emissions from oil venting	Yes
4	12	STR REC	Energy	1B2A	The ERT noted that categories reported by Ukraine as "NE" include: CO2 and N2O emissions from oil flaring (reported as "included elsewhere" ("IE"))	Yes
5	12	STR REC	Energy	1B2B	The ERT noted that categories reported by Ukraine as "NE" include: CO2 and CH4 emissions from natural gas exploration	Yes
6	12	STR REC	Energy	1B2B	The ERT noted that categories reported by Ukraine as "NE" include: CO2 and CH4 emissions from venting of natural gas	Yes
7	12	STR REC	IP	2F	The ERT noted that categories reported by Ukraine as "NE" include: HFC, PFC and SF6 emissions from foam blowing, fire extinguishers, aerosols/metered dose inhalers and solvents	Yes
8	12	STR REC	LULUCF	5A1	The ERT noted that categories reported by Ukraine as "NE" include: CO2 emissions from dead organic matter and mineral soils in forest land remaining forest land	Yes

#	Para in ARR2010	Recommendation character	Sector	Category	Brief description of the ERT recommendation/notification	Corrected in Ukrainian submission 2011
9	12	STR REC	LULUCF	5	The ERT noted that categories reported by Ukraine as “NE” include: CO2, CH4 and N2O emissions from biomass burning on land converted to forest land, on land converted to cropland, on forest land converted to cropland, on grassland and on wetlands	Yes
10	12	REC	Energy	1B2B	CO2 emissions from natural gas transmission are reported as “not occurring” (“NO”). The ERT considers that some of these emissions are likely to occur in the country.	Yes
11	12	REC	IP	2F1	HFC, PFC, and SF6 emissions from refrigeration and air conditioning equipment (except for HFC-134a) are reported as “not occurring” (“NO”). The ERT considers that some of these emissions are likely to occur in the country.	Yes
12	13	REC ADJ	IP	2F	Ukraine reported HFC, PFC and SF6 emissions from foam blowing, fire extinguishers, aerosols/metered dose inhalers and solvents under the category consumption of halocarbons and SF6 as "NO".	Yes
13	14	STR REC	LULUCF		Complete its reporting under Article 3, paragraphs 3 and 4, of the Kyoto Protocol	Yes
14	16	CONCL	NIS		national system of Ukraine requires urgent improvements to address the issues mentioned above in order to comply with the requirements set out in the annex to decision 19/CMP.1 including: ensuring the transparency and completeness of the inventory; timeliness of submission; supporting compliance with Kyoto Protocol commitments relating to the estimation of anthropogenic GHG emissions by sources and removals by sinks under Article 3, paragraphs 3 and 4; and responding to any issues raised by the inventory review process under Article 8 of the Kyoto Protocol (decision 22/CMP.1).	Yes

#	Para in ARR2010	Recommendation character	Sector	Category	Brief description of the ERT recommendation/notification	Corrected in Ukrainian submission 2011
15	19	REC	NIS		the list and role of private companies in the national system is not clarified in the NIR	Yes
16	26	STR REC REITER	Energy	1AA	for the years 1991-1997 the inventory lacks complete data on fuel consumption by category, which the Party explained was caused by changes that occurred in the Ukrainian statistical system.	Yes
17	27	REC	QA/QC		information in the NIR does not include an annual schedule for the implementation of QA/QC procedures	Yes
18	28	REC	QA/QC		include all related information about the recommendations made by independent reviewers and how the recommendations were addressed in the inventory compilation	Yes
19	30	STR REC	Energy	1AA	the reporting for the energy sectors still lacks transparency	Yes
20	30	STR REC	IP	2C1	the reporting for the industrial processes sectors still lacks transparency	Yes
21	30	STR REC	IP	2	the transparency of the AD and EFs used in the industrial processes sector decreased in the 2010 submission, because limited information was provided for some categories due to the confidentiality of data, and also because of the aggregation of these categories with likely non-confidential categories, with no additional explanations on the increased confidentiality provided in the NIR	Yes
22	32	STR REC REITER	LULUCF		the land representation in the LULUCF sector and the identification of areas under KP-LULUCF activities are not consistent and reporting in the sectoral LULUCF and KP-LULUCF CRF tables is not transparent	Yes
23	29	STR REC REITER	Agriculture	4	Explanations for the country-specific parameters (e.g. FracGASF) used in the agriculture sector had not been improved	Yes

#	Para in ARR2010	Recommendation character	Sector	Category	Brief description of the ERT recommendation/notification	Corrected in Ukrainian submission 2011
24	35	STR REC	Energy	1AA	number of strong recommendations in the previous review report have not yet been implemented, particularly those relating to the transparency of AD and EFs in the energy and industrial processes sectors, the provision of the energy and coke balances	Yes
25	35	STR REC	IP	2C1	number of strong recommendations in the previous review report have not yet been implemented, particularly those relating to the transparency of AD and EFs in the energy and industrial processes sectors, the provision of the energy and coke balances	Yes
26	35	STR REC	LULUCF		improvements required for LULUCF and KP-LULUCF reporting (e.g. ensuring a consistent land representation and identification of areas of KP-LULUCF activities in line with the IPCC good practice guidance for LULUCF and reporting of information on the geographical location of the areas used for calculation of the units of land subject to afforestation, reforestation, deforestation and forest management activities)	Yes
27	35	STR REC	LULUCF		verify its country-specific approach, based on the balance of nitrogen (N) fluxes, and to estimate emissions and removals from soils (preferably by comparing the current method with the tier 2 approach in the IPCC good practice guidance for LULUCF) for the key category cropland remaining cropland	Yes
28	36	Ukraine Ident	Energy	1AA	The development of country-specific EF CO2 emissions from combustion of natural gas	Yes
29	36	Ukraine Ident	Energy	1B	The development of country-specific EF CH4 fugitive emissions from natural gas leakage from end-users	Yes

#	Para in ARR2010	Recommendation character	Sector	Category	Brief description of the ERT recommendation/notification	Corrected in Ukrainian submission 2011
30	36	Ukraine Ident	IP	2C2	The development of country-specific EF CO2 emissions from ferroalloys	Yes
31	36	Ukraine Ident	IP	2B3	The development of country-specific EF CO2 emissions from adipic acid production	Yes
32	36	Ukraine Ident	IP	2B1	The improvement of AD and parameters ammonia production	Yes
33	36	Ukraine Ident	IP	2F8	The improvement of AD and parameters SF6 use in electrical equipment	Yes
34	36	Ukraine Ident	LULUCF	5	The improvement of AD and parameters the updating of the areas of forest land, cropland and grassland (areas of different soil types by climatic zone)	Yes
35	37	ERT Ident	LULUCF		The provision of the information on the structure of the national system for the compilation and reporting of KP-LULUCF activities	Yes
36	37	ERT Ident	LULUCF		The provision of a matrix of land-use conversions for the LULUCF sector for the representation of areas of land-use categories;	Yes
37	37	ERT Ident	LULUCF		The improvement of the national system to ensure that areas of land subject to LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol are identifiable in accordance with paragraph 20 of the annex to decision 16/CMP.1;	Yes
38	37	ERT Ident	General		The reporting of all relevant AD used in the inventory, particularly for the energy and industrial processes sectors, including the energy and coke balances;	Yes
39	37	ERT Ident	IP	2	The aggregation of confidential AD and emissions in a coherent way for confidential categories in the industrial processes sector	Yes
40	41	REC REITER	Energy	1AA	provide relevant information on the national energy balance, and use the splicing techniques recommended in the IPCC good practice guidance	Yes

#	Para in ARR2010	Recommendation character	Sector	Category	Brief description of the ERT recommendation/notification	Corrected in Ukrainian submission 2011
41	41	STR REC	Energy	1AA	develop and use country-specific CO2 EFs and oxidation factors	Yes
42	41	ENCOUR	Energy	1AA	develop and use country-specific CH4 and N2O Efs	Yes
43	44	ENCOUR	Energy	1	improve the implementation of QA/QC procedures and verification activities, in particular using tier 2 QC procedures for key categories and to provide the relevant information in the NIR	Yes
44	46	REC REITER	Energy	1AA	the value of the losses factor for different fuels and the amount of losses in the transformation of different fuel types are not provided in the NIR. Therefore, the ERT could not assess whether they have been properly included in calculations and reported in the CRF tables.	Yes
45	49	REC REITER	Energy	1AB	further explore the possible reasons for the difference in the estimates for emissions from the consumption of solid fuels	Yes
46	49	REC REITER	Energy	1AC	clarify whether double counting of carbon stored in products has occurred, whether or not emission sources were included in calculations using the reference approach and whether emission estimates calculated using the sectoral approach have been overestimated	Yes
47	49	REC REITER	Energy	1AB	provide detailed data for the production, import, export and consumption of coke and coking coal (a coke balance is not provided in the current submission)	Yes
48	49	REC REITER	Energy	1AB	explain clearly and in detail the reasons for the differences between the reference and sectoral approaches	Yes
49	49	REC	Energy	1AB	clarify in the NIR the reasons for discrepancies (RA & SA) and the steps taken to minimize them.	Yes

#	Para in ARR2010	Recommendation character	Sector	Category	Brief description of the ERT recommendation/notification	Corrected in Ukrainian submission 2011
50	50	REC	Energy	1C1A	International bunker fuels: improve the consistency of the time series of data (1991-1995)	No
51	50	ENCOUR	Energy	1C1A	International bunker fuels: develop country-specific EFs for its calculations	No
52	51	REC REITER	Energy	1C1B	The ERT recommends that Ukraine examine and improve its method and the appropriate use of AD, and report transparently and in detail the calculations made for marine bunkers and domestic navigation in the NIR of its next annual submission.	Yes
53	52	REC	Energy	1AB	provide a mass balance of coking coal and coke	Yes
54	52	REC	Energy	1AB	provide a mass balance natural gas	Yes
55	52	REC REITER	Energy	1AA1C	provide further information on the method used to calculate and allocate emissions from coke production and use	Yes
56	53	REC REITER	Energy	1AD	Feedstocks and non-energy use of fuels: explain more clearly the estimation methods used and include supporting background data	Yes
57	54	REC	Energy	1AA2	further improve transparency, Ukraine provide further information on how it allocates and reports fuels and their emissions under stationary combustion, in particular in the manufacturing industries and construction category	Yes
58	54	REC	Energy	1A	use country-specific CO2 EFs for key categories in accordance with the IPCC good practice guidance	Yes
59	55	REC	Energy	1B2C	use the appropriate notation key for venting of natural gas in its next annual submission, as well as check the proper use of notation keys for all categories and gases in accordance with the UNFCCC reporting guidelines	Yes

#	Para in ARR2010	Recommendation character	Sector	Category	Brief description of the ERT recommendation/notification	Corrected in Ukrainian submission 2011
60	56	REC	Energy	1B2C	recommends that Ukraine use these data sources for future annual submissions and transparently document the methodology, EFs and AD used for the revised calculations	Yes
61	57	REC	Energy	1AA3B	The ERT noted that the IEF for CH4 for liquefied petroleum gas (LPG) in road transportation reported by Ukraine in the CRF tables is equivalent to that reported for natural gas and appears to be taken from the default EF for natural gas in table 1-7 of the Reference Manual of the Revised 1996 IPCC Guidelines (50 kg/TJ). This is not the correct EF to use for calculating CH emissions from LPG used by road transportation	Yes
62	58	STR REC	Energy	1AA3B	The ERT noted that the N2O EF used in the calculations for gasoline cars (0.6 kg/TJ) for the complete time series is below the IPCC default range (1ñ20 kg/TJ) and that the EF used for diesel cars (0.6 kg/TJ) for the complete time series is below the IPCC default range (3ñ4 kg/TJ). Ukraine has not provided information in a transparent manner on the number of new and used vehicles equipped with different technologies that would justify the use of lower or higher EFs. Some age and technology classes of vehicles have significantly higher N2O emissions and the EFs used in the inventory may not be representative of the actual condition of the vehicle fleet, and may lead to an underestimation of emissions from some vehicle age and technology classes	Yes
63	62	REC	IP	2F2	"NO" be reported for foam blowing if all the imports are referred to open-cell foams, otherwise if at least part of the imports are referred to closed-cell foams, emissions should be estimated.	Yes

#	Para in ARR2010	Recommendation character	Sector	Category	Brief description of the ERT recommendation/notification	Corrected in Ukrainian submission 2011
64	63	REC ADJ	IP	2F	ERT recommended that Ukraine check whether these subcategories and other subcategories and relevant related gases under consumption of halocarbons and SF6 occur in the country, in particular for the subcategory refrigeration and air conditioning equipment; and for those categories and gases occurring in the country provide estimates in accordance with the IPCC good practice guidance.	Yes
65	65	STR REC	IP	2	aggregate emissions in a coherent and systematic way so that emissions corresponding to confidential categories are grouped under the same category where their AD are reported, that fewer categories are reported as confidential and allow provision of data in future reviews at the request of ERT.	Yes
66	67	REC	IP	2A2	for 1990-2003 data for lime production disaggregated into types of lime were not available and the country-specific ratio for hydrated/quicklime of 2004 (55/45) was used for all these years. However, since 2004, data disaggregated by type of lime have been available and applied, resulting in some CO2 IEF fluctuations after 2004 (0.6-2.5%). However, these data were not provided in the NIR.	Yes
67	68	REC	IP	2A2	the CRF tables report an IEF of 0.6526 t/t for lime production in 2008, which is lower than the default values (0.75 t/t for high-calcium quicklime and 0.86 t/t for dolomitic lime). The ERT considers that, in the CRF tables, Ukraine reported total lime production as AD even though emissions were estimated using a default 0.97 correction factor for hydrated lime, as recommended in the IPCC good practice guidance.	Yes

#	Para in ARR2010	Recommendation character	Sector	Category	Brief description of the ERT recommendation/notification	Corrected in Ukrainian submission 2011
68	69	REC	IP	2A3	The NIR explains that Ukraine estimated emissions from limestone and dolomite use in metal production and glass production. However, the CRF tables present only limestone use as AD under this category. During the centralized review, in its response to the ERT questions regarding the provision of data on dolomite use, Ukraine explained that because glass production is confidential, dolomite data are also confidential and thus cannot be reported or provided. This exclusion of the amount of dolomite used led to a higher CO2 IEF (0.4845 t/t), although default EFs were used to estimate emissions (0.440 t/t for limestone and 0.477 t/t for dolomite)	Yes
69	70	REC	IP	2A2	The ERT noted a mistake in the estimation of total consumption of limestone in table 4.2 of the NIR, which might have led to an underestimation of emissions	Yes
70	72	STR REC REITER	IP	2C1	provide a coke balance (carbon in coke) to increase the transparency of the estimates and ensure that there is no double counting or omission of emissions.	Yes

#	Para in ARR2010	Recommendation character	Sector	Category	Brief description of the ERT recommendation/notification	Corrected in Ukrainian submission 2011
71	73	REC	IP	2	Ukraine reports that the AD for silicon carbide and soda ash production are confidential. CRF table 2(I).A-G reports aggregated CO2 emissions for soda ash use and carbide production (both silicon and calcium, as explained in the NIR). CH4 emissions from silicon carbide production are reported under the aggregated category ethylene and other production, but the AD for this category do not include silicon carbide production. The NIR provides methodological explanations only for calcium carbide production and use. The ERT concluded that the reporting of emissions from carbide production is not transparent and not in line with the IPCC good practice guidance, and the fact that the categories were not aggregated in a systematic way makes it difficult for the ERT to assess the consistency, comparability and accuracy of estimates.	Yes

#	Para in ARR2010	Recommendation character	Sector	Category	Brief description of the ERT recommendation/notification	Corrected in Ukrainian submission 2011
72	74	REC	IP	2B	The ERT noted that the AD for nitric acid production and adipic acid production are reported as "C", while N2O IEFs are reported as "IE". N2O emissions for these two categories are reported aggregated under one category. The NIR reports that the IPCC default EF was used to estimate emissions from adipic acid production and country-specific EFs were used for nitric acid production, which the Party states are in line with the average of the IPCC default range (2-19 kg/t). During the centralized review, Ukraine provided the ERT with the country-specific EF of 4.5 t/t, which is equal to the default value in the IPCC good practice guidance for atmospheric pressure plants. The NIR reports that emission estimates were assessed by an independent expert, although no further information or descriptions are provided, for example on the abatement technology used in the country.	Yes
73	78	REC	Agriculture	4	provide justifiable explanations on fluctuations of emissions time series with supporting charts or tables when necessary	Yes
74	79	REC REITER	Agriculture	4A	There is no descriptive information on uncertainty analysis or on the methodologies used for calculating the uncertainties of estimates performed using tier 3 methods for CH4 emissions from enteric fermentation	Yes
75	80	REC	Agriculture	4	report clearly and accurately the increase or decrease resulting from the recalculations for categories and for the sector, as well as the impact on the national total.	Yes
76	83	ENCOUR	Agriculture	4A	provide more detailed explanations in methodologies used to estimate the EFs.	Yes
77	83	ENCOUR	Agriculture	4A	conduct a peer review of country-specific EFs and document the results in the NIR	Yes

#	Para in ARR2010	Recommendation character	Sector	Category	Brief description of the ERT recommendation/notification	Corrected in Ukrainian submission 2011
78	84	REC	Agriculture	4A	The CH4 IEFs for non dairy cattle for 1990-2008 (ranging from 0.87 to 15.14 kg/head/year) fluctuate every year. The 2008 value (2.17 kg/head/year) is 85.6 per cent lower than the value in 1990. As explained in the NIR, this is due to changes of AWMS practices, mainly in modern dairy farms which have been built in recent years; however, the ERT notes that the explanation is not sufficiently clear.	Yes
79	87	REC	Agriculture		The ERT noted that no explanations have been provided in the NIR on the differences of area cultivated organic soils or on the reliability of the data used for the current inventory.	Yes
80	90	REC	LULUCF		provide a detailed explanation on the assumptions and approaches used to detect land converted to forest land.	Yes
81	90	STR REC	LULUCF		include in its reporting all mandatory land-use conversions	Yes
82	91	REC	LULUCF		classify temporary fallow under the cropland category in accordance with the IPCC good practice guidance for LULUCF.	Yes
83	92	REC	LULUCF		estimate and report N2O emissions from N fertilization of forest land if AD related to this activity are available	Yes
84	92	REC REITER	LULUCF		CO2 emissions from the application of limestone on grassland have been reported also as "NE", and the Party explained in the CRF tables that the data for the application of limestone on grassland are not available.	Yes

#	Para in ARR2010	Recommendation character	Sector	Category	Brief description of the ERT recommendation/notification	Corrected in Ukrainian submission 2011
85	93	REC	LULUCF		provide additional information on the method and assumptions used in the uncertainty assessment, to clarify how values, especially those based on expert judgement, are selected, considering that the reported values are considerably lower than the uncertainty default values	Yes
86	95	STR REC	LULUCF		The ERT noted discrepancies between that forest land areas reported in the NIR (table П3.2.20) and those reported in the CRF tables;	Yes
87	96	REC	LULUCF		Ukraine provided a table showing distribution of administrative districts by the different natural zones.	Yes
88	96	STR REC REITER	LULUCF		ERT notes that the information provided is not sufficient to allow an evaluation of the carbon stock changes estimates	Yes
89	98	REC REITER	LULUCF		verify its estimates (preferably by comparing the current method with the tier 2 approach in the IPCC good practice guidance for LULUCF)	Yes
90	98	STR REC	LULUCF		provide additional information explaining the emissions/removals trend of cropland soils and the methodology used in the estimates, focussing on the relation C:N used	Yes
91	99	STR REC	LULUCF		Ukraine used a country-specific approach, based on the balance of N fluxes, to estimate emissions and removals from soils, similar to the approach used for the cropland remaining cropland category. The ERT noted a significant difference (300.6 per cent of decrease) in the estimate of CO2 emissions and removals from the grassland remaining grassland category in 2007, between the 2009 and 2010 submissions.	Yes

#	Para in ARR2010	Recommendation character	Sector	Category	Brief description of the ERT recommendation/notification	Corrected in Ukrainian submission 2011
92	100	REC	LULUCF		Ukraine reported carbon stock changes in living biomass and in dead organic matter (not mandatory) as "NE" for the period 1990-2008, explaining that data on perennial trees do not exist in Ukraine.	Yes
93	110	REC ADJ	IP	2F1	HFC and PFC emissions from refrigeration and air-conditioning equipment	Yes
94	110	REC ADJ	IP	2F2	HFC emissions from foam blowing	Yes
95	110	REC ADJ	IP	2F3	HFC and PFC emissions from fire extinguishers	Yes
96	110	REC ADJ	IP	2F4	HFC emissions from aerosols/metered dose inhalers	Yes
97	139	CONCL	LULUCF		During the centralized review, the ERT noted that in Ukraineís reporting, land uses and land-use changes are not properly represented, resulting in overlapping areas of different categories and conversion categories, leading to double counting and consequently to a potential overestimation of removals by sinks and underestimation of emissions by sources. ERT considered that Ukraine did not meet the mandatory requirements regarding the national system for Article 3, paragraphs 3 and 4, of the Kyoto Protocol in its 2010 submission, or the mandatory reporting requirements included in decision 15/CMP.1	Yes
98	142	REC	LULUCF		approach 1 for representing land areas which Ukraine intends to use does not meet the land area identification requirements under the Kyoto Protocol; in fact, approach 1 can only be applied to reporting method 1 if additional spatial data at the required spatial resolution are available as a result of re-compiling the inventory information, and if the gross land-use transitions (rather than the net changes in land-use categories) are quantified (IPCC good practice guidance for LULUCF, section 4.2.2.3.1, page 4.25).	Yes

#	Para in ARR2010	Recommendation character	Sector	Category	Brief description of the ERT recommendation/notification	Corrected in Ukrainian submission 2011
99	143	CONCL	LULUCF		ERT notes that the national system is not able to ensure a consistent land representation, or to ensure that areas of land subject to LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol are identifiable in accordance with paragraph 20 of annex to decision 16/CMP.1	Yes
100	144	REC	LULUCF		2010 submission Ukraine has not accounted for all carbon stock changes in the following mandatory carbon pools: dead wood (for the units of land subject to afforestation, reforestation and deforestation activities); and litter, dead wood and soil (for the units of land subject to forest management activities). The ERT noted that a Party may choose not to account for a given pool in a commitment period if transparent and verifiable information is provided that the pool is not a net source (para. 21 of the annex to decision 16/CMP.1). The ERT also noted that Ukraine did not provide transparent and verifiable information demonstrating that these unaccounted pools were not net sources of emissions. Therefore Ukraine did not meet the mandatory reporting requirements stated in decisions 15/CMP.1 and 16/CMP.1.	Yes

#	Para in ARR2010	Recommendation character	Sector	Category	Brief description of the ERT recommendation/notification	Corrected in Ukrainian submission 2011
101	145	STR REC	LULUCF		Ukraine provided a document containing an expert opinion relating to the carbon stocks in the dead wood, litter and soil pools in forest. In the ERTís view, this study and the graph reported on ìDynamics of carbon stocks in modal pine plantations on left-bank of wooded steppe regions in Ukraineî do not demonstrate that the dead wood, litter and soil pools are not net sources of emissions for the Ukrainian national territory, as carbon stocks are correlated to different management practices and climatic conditions and a single study (on plantations) cannot be representative of the national territory.	Yes
102	147	REC	LULUCF		Ukraine provided information on its forest definition and forest management rules in its 2010 annual submission and in responses the Party provided to the ERT during the centralized review. However, the ERT considered that the information provided did not demonstrate that activities of planting, seeding and/or human-induced promotion of natural seed sources have been carried out in the units of land in conversion to forest (para. 1(b) and 1(c) of the annex to decision 16/CMP.1).	Yes

#	Para in ARR2010	Recommendation character	Sector	Category	Brief description of the ERT recommendation/notification	Corrected in Ukrainian submission 2011
103	148	REC	LULUCF		Ukraine also indicated that afforestation activities in Ukraine are conducted according to: Instructions for designing, acceptance, recording and evaluating the quality of the cultivatedsites (approved by the Ministry of Forestry of Ukraine on 8 July 1997, No. 62) and Rules offorest reproduction (approved by the Cabinet of Ministers of Ukraine on 1 March 2007, No.303). Under these requirements, special documentation for projects of afforestation shouldbe prepared for each case and for different periods of this activity, according to the requirements of the law. Ukraine also indicated that this documentation may be used for the demonstration of direct human-induced components. In the ERTís view, the response provided by Ukraine does not address the potential problem. In particular, no information has been supplied to demonstrate that all natural regeneration of forests is the consequence of direct human-induced activities or that a decision was taken to allow trees to grow as a promotion of natural seed sources on each unit of land reported under afforestation and reforestation activities. Therefore the ERT considers this problem as unresolved.	Yes
104	151	STR REC	LULUCF		Ukraine reported carbon stock changes in above-ground biomass, litter and soil pools, but the Party reported below-ground carbon stock changes as ìIEî and did not provide estimates for the dead wood pool.	Yes
105	152	STR REC	LULUCF		Ukraine did not report GHG emissions from biomass burning. During the centralized review, Ukraine clarified that data on burned areas are available only for land covered by forest, without distinction between area under afforestation/reforestation or forest management activities. Ukraine also acknowledged the need to conduct special	Yes

#	Para in ARR2010	Recommendation character	Sector	Category	Brief description of the ERT recommendation/notification	Corrected in Ukrainian submission 2011
106	153	CONCL	LULUCF		In its 2010 submission, Ukraine did not provide information on emissions and removals of GHG from lands harvested during the first commitment period following afforestation and reforestation on these units of land since 1990. Therefore, the ERT considered that Ukraine did not meet the mandatory reporting requirements stated in paragraph 8(c) of the annex to decision 15/CMP.1 and recommended that the Party provide this required information.	Yes
107	154	STR REC	LULUCF		Ukraine reported carbon stock changes in above-ground biomass, litter and soil pools, but the Party reported below-ground carbon stock changes as "IE" and did not provide estimates for the dead wood pool.	Yes

Annex C: Response of Ukraine to the Potential Problems and Further Questions from the ERT formulated in the course of the 2010 review of the greenhouse gas inventories of Ukraine submitted in 2010. ERT assessment of the Response of Ukraine

Kyiv, 16 October 2010

Response of Ukraine to the Potential Problems and Further Questions from the ERT formulated in the course of the 2010 review of the greenhouse gas inventories of Ukraine submitted in 2010

ERT assessment of the Response of Ukraine

For the ERT

Ms. Tatiana Tugui
Lead Reviewer

Mr. Leif Hockstad
Lead Reviewer

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 18 October 2010.

National System

#1 Potential problem/question:

National systems shall ensure that areas of land subject to land use, land-use change and forestry activities under Article 3, paragraphs 3 and 4, 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, of the Kyoto Protocol (Decision 16/CMP.1 - para. 20).

The ERT noted that Ukraine does not meet this mandatory reporting requirement under Article 3, paragraphs 3 and 4 in its 2010 submission.

Recommendation by the ERT:

The ERT recommends that Ukraine provide information in accordance with the requirements of para. 20 of Decision 16/CMP.1.

Response of Ukraine

Ukraine has started a special investigation for elaboration of the data base with a cartographic component. The research institute will provide for the institutional aspects of this activity. Ukraine adopted the Approach 1 for providing information whereby the geographical boundaries include units of the territory of lands with the numerous activities realized. The final result of the mentioned above investigation will be a data base on the administrative districts level with indicated boundaries of region and forestries. Ukrainian administrative regions consist of administrative districts. The data base will include information not only on current condition of 3.3-3.4 activities, but on time series as well. The content of the future cartographic material for all Ukrainian forestries will be the same as shown on the Figs.1 and 2. The initial moment depends on the start moment of official Forestry documented entries but in any case the start date of activity will be after 1990. The detailed data base about quality and quantity of 3.3 and 3.4 activities will be developed in the tables shape. It is noted that Ukrainian forestries are collecting most of necessary information and reporting about several aspects of this work to the State Forestry Committee of Ukraine.
The first results of this investigation indicated below (see Figures 1and 2 and Tables 1 and 2). At present Ukraine has conducted the questionnaire survey of Ukrainian forestries. The level of the administrative boundaries of the regions is chosen as spatial unit for providing information in this document. The data in this document are aimed at the demonstration of Ukraine's capacity. Ukraine has opportunity to elaborating a systematical information data base in accordance with the requirements of the paragraph 6(b) of Decision 15/CMP.1. Ukraine has got all aspects of necessary data but these regard forestry alone.

Ukrainian national inventory system conducted the recalculations for KP-LULUCF activities and attached resubmissions results (CRF tables for KP-LULUCF).

ERT assessment

Ukraine provided new data on Afforestation, Reforestation and Deforestation activities in the period 1998–2008, and resubmitted CRF tables for KP-LULUCF.

Comparing the resubmitted data (KP-UKR-2010-2008-v3.1.xls) and the previously submitted data (KP-UKR-2010-2008-v2.3.xls), it can be noted that the AR area was reported to be 229 kha against 1074 kha of the previous submission, D area passed from 29 kha previously reported to 10 kha. Regarding Article 3.4 activities (Forest Management), the area reported in the resubmission was equal to 10098 kha against the 8148 kha previously reported.

The emissions/removals related to Article 3.3 activities have decreased by 80.7%, while the removals for Article 3.4 activities (Forest Management) have increased by 33.2%.
According to the ERT, the recalculations, and the consequent resubmission, is not addressing the raised issue, considering that the recalculated data are not resulting from the "special investigation" on the articles 3.3 and 3.4 activities, that just started in Ukraine.

The ERT would like to remind Ukraine that according to the IPCC good practice guidance for LULUCF, approach 1 for representing land areas does not meet the land area identification requirements under the Kyoto Protocol; in fact approach 1 can only be applied to Reporting Method 1 if additional spatial data at the required spatial resolution are available as a result of re-compiling the inventory information, and if the gross land-use transitions (rather than the net changes in land-use categories) are quantified (IPCC good practice guidance for LULUCF, section 4.2.2.3.1, page 4.25). The ERT recommends Ukraine to check the availability of additional spatial data as noted in the IPCC good practice guidance for LULUCF section 4.2.2.3.1.

In the ERT's view, **Ukraine does not meet the mandatory reporting requirement under Article 3, paragraphs 3 and 4, of the Kyoto Protocol in its 2010 submission** indicated above in the identification of potential problem; in particular, **the national system is not able to ensure a consistent land representation, or to ensure that areas of land subject to land use, land-use change and forestry activities under Article 3, paragraphs 3 and 4, are identifiable (Decision 16/CMP.1 - para. 20)**.

The ERT considers this problem as unresolved.

#2 Potential problem/question:

In accordance to Decision 19/CMP.1 paras. 10(b) and 14(c) of the Annex, each Party shall:

"Ensure sufficient capacity for timely performance of the functions defined in these guidelines for national systems, including data collection for estimating anthropogenic GHG emissions by sources and removals by sinks and arrangements for technical competence of the staff involved in the inventory development process;"

and

"Collect sufficient activity data, process information and emission factors as are necessary to support the methods selected for estimating anthropogenic GHG emissions by sources and removals by sinks;"

In this respect the ERT notes that Ukraine over the last few years has not been able to collect the necessary activity data, process information and emission factors to estimate the relevant GHG emissions by sources and removals by sinks as applicable. The ERT further notes that Ukraine has consistently, in past and its current NIR, presented plans to estimate missing GHG emissions which have not been materialized in its 2010 submission.

Recommendation by the ERT:

The ERT recommends that Ukraine ensure the collection of sufficient activity data, process information and emission factors in order to estimate all missing GHG emissions as noted in the inventory related problems section, as stipulated in para. 10(b) and 14(c) of the Annex to Decision 19/CMP.1, for those categories in which emissions are known to occur in the country and for which methodologies to estimate emissions are available in the Intergovernmental Panel on Climate Change (IPCC) Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories and the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.

Response of Ukraine

As a result of economic crisis and limited public financing, the investigations aimed at supporting of the national system were not funded. Currently, part of the financial sources from the AAUs sale is planned to be used for support of the National GHG Inventory. Investigations planned to be financed are listed below (Attachment B). Investigations listed in Attachment B were examined and approved by scientific and technical council of National Environmental Investment Agency of Ukraine (protocol #4.10 from 21.09.2010) and Interagency workgroup (protocol #2/2010 from 24.09.2010), and during the period from 27 September to 01 October 2010 were approved by the Japanese Party as the investigations that will be implemented under support of funds received by Ukraine from the sale of the assigned amount units from 2009 to 2010.
Research Institutes for investigations executing will be determined on the tender basis in accordance with Ukrainian legislation.

ERT assessment

The ERT considered the response of the Party given to the potential problem #2 above, about conformity of the national system of Ukraine to paragraphs 10(b) and 14(c) of the annex to decision 19/CMP.1. In its consideration the ERT took into account the responses of Ukraine given to inventory related potential problems for missing estimates in the energy and industrial processes sectors, as well as the ability of the national system for reporting under Article 3, paragraphs 3 and 4, of the Kyoto Protocol (potential problems #1 for national system and potential problems #1-3 for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol).

The ERT concluded that Ukraine does not meet the mandatory reporting requirements under Article 3, paragraphs 3 and 4, of the Kyoto Protocol and that the national system is not able to ensure a consistent land representation, neither ensuring that areas of land subject to land use, land-use change and forestry activities under Article 3, paragraphs 3 and 4, are identifiable (decision 16/CMP.1 - para. 20). Further the ERT noted that missing estimates in the industrial processes sector are not provided and the problem was not resolved in the course of the review.

As noted by the ERT in the description of the potential problem for national system #2, over the last few years Ukraine has not been able to provide estimations for missing categories and has consistently presented plans to improve its reporting in the next submission. Due to the fact that the same response has been provided by Ukraine to the list of potential problems for several years and that the Party stated its intention first to sale the assigned amounts units and after that finance investigations to be able to estimate missing mandatory categories, **the ERT concluded that national system of Ukraine does not perform its functions in accordance to the Decision 19/CMP.1, paras 10(b) and 14(c).**

The ERT considers this problem as unresolved.

Calculation of the commitment period reserve

Potential problem(s)/question(s):
Ukraine has reported that its commitment period reserve is 2,180,026,350 t CO_2 eq, based on emissions from the latest inventory year (reported in its 2009 submission). This is not in line with Decision 11/CMP.1, which stipulates that Parties shall use the most recently reviewed inventory (if lower than the CPR estimated based on 90% of their assigned amount). This inventory should at this stage be the 2008 one (2010 submission) and not the 2007 one.

Recommendation by the ERT:

The ERT recommends that Ukraine revise its commitment period reserve in accordance with Decision 11/CMP.1 using the 2008 inventory of its 2010 submission.

Response of Ukraine
Ukraine has reported that its commitment period reserve is 2138995595 t CO2eq, based on emissions from 2008 year (reported in its 2010 submission). The information and calculation description is given in Chapter 12 and placed on the UNFCCC official submission portal on August 16, 2010, before the centralised review week started.

During the preparation of response to the "Potential Problems and Further Questions from the ERT formulated in the course of the 2010 review of the greenhouse gas inventories of Ukraine submitted in 2010" the total of CO2 equivalent emissions without LULUCF had changed due to recalculations in category «1. B. 2. b. Natural Gas - iii. Transmission». Please, find revised CPR value:

427842682.2 tonnes CO2 eq. x 5 = 2139213411 tonnes CO2 eq.

Real reserve on 30.12.2009 equal 4544475399 tonnes CO2 eq.
So calculated CPR lover than real reserve.

ERT assessment
The ERT considered the revised CPR value provided by Ukraine and noted that the value is correctly calculated.

However, the ERT would like to inform Ukraine that this value would be changed as a result of the adjustments procedures that the ERT intends to conduct in accordance with the Article 8 review guidelines under the Kyoto Protocol, see potential problem on Consumption of Halocarbons and SF_6 below.

Activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

Description of potential problems identified:

#1 - Not reported mandatory pools:
Each Party included in Annex I shall account for all changes in the following carbon pools: above-ground biomass, below-ground biomass, litter, dead wood, and soil organic carbon. A Party may choose not to account for a given pool in a commitment period if transparent and verifiable information is provided that the pool is not a source (para. 6(e) of Annex to Decision 15/CMP.1).

Ukraine, in its 2010 submission, did not account for the dead wood pool, for the units of lands subject to the Article 3.3 activities; for the lands subject to the Forest Management activities (Article 3.4) Ukraine did not account for the litter, dead wood and soil pools.

When not accounting for pools, without providing transparent and verifiable information that the not accounted pools are not sources, Ukraine is not meeting the mandatory reporting requirements stated in Decisions 15/CMP.1 and 16/CMP.1.

Recommendation by the ERT:
The ERT recommends to provide the required information indicated above.

Response of Ukraine
Ukraine has started the special investigation for assessment of quantity and dynamics of carbon content in litter and dead wood pools in forest of different climatic zones.

ERT assessment
Ukraine provided an "expert opinion" relating to the carbon stocks in dead wood, litter and soils pools in forest. In particular, Ukraine referred to a study[5] on the dynamics of carbon stocks in plantations. According to the ERT, the abovementioned study (and the reported figure) **does not demonstrate that the dead wood, litter and soils pools are not net sources**, for the Ukrainian national territory, as carbon stocks are correlated to the different management practices and to climatic conditions and a single study (on plantations) cannot be representative of the national territory. This study does not consider the effects of harvesting at the end of a production cycle and during the following years with low biomass on that land. In ERT's view, **the provided response by Ukraine does not address the potential problem**. **In particular, the requested demonstration and supporting additional information have not been provided.** As stated by the Party, a forest monitoring system, with continuous observations, has to be implemented to supply supporting information required by rules under the Kyoto Protocol.

The ERT considers this problem as unresolved.

#2 - Direct human induced activities under Article 3.3
The inclusion of a land (and related emissions by sources and removals by sinks occurring on that land) in the Article 3.3 reporting, is specifically guided by the presence of a direct human-induced activity (see Decision 16/CMP.1, para. 1). Consequently, carbon stock changes and non-CO_2 emissions reported under Afforestation and Reforestation shall result from direct human-induced land-use change activities (see Article 3.3 of the Kyoto Protocol). For this reason Parties are requested (see Decision 15/CMP.1, para. 8) to report information on the nature of activity/ies occuring on each unit of land converted from other uses to forest in order to demonstrate that the conversion is directly human-induced.

Ukraine provided information on the forest definition and forest management rules in its 2010 submission and the responses provided to the ERT during the review week.

The ERT has the concern that the provided information does not demonstrate that activities of planting, seeding and/or human-induced promotion of natural seed sources have been carried out in the units of land in conversion to forest (see Decision 16/CMP.1, para. 1). The ERT is of the view that this may lead to an overestimation of removals by sinks in the areas under Afforestation and Reforestation activities.

Recommendation by the ERT:
The ERT recommends that Ukraine provide documentation regarding that all afforestation and reforestation activities included in the identified units of land under these activities, are directly human induced.

[5] Inventory of greenhouse gases in land use and forestry sector". Monograph / I.F.Buksha, O.V.Butrym, V.P.Pasternak. KhNAU. – Kharkiv, 2008. – 232 p.

Relevant documentation may include forest management records or other documentation that demonstrates that a decision had been taken to replant or to allow forest regeneration by other means and demonstrates whether planting, seeding and/or human-induced promotion of natural seed sources had been applied.

Response of Ukraine
Ukraine has started the special investigation for elaborating of the data base with the cartographic component. These date base will include the information evidences of direct human component in these types of activities.

The activities of afforestation in Ukraine is conducted according by: Instructions for designing, acceptance, recording and evaluating the quality of the cultivated sites (Approved by the Ministry of Forestry of Ukraine from 08.07.97 N 62); Rules of forest reproduction (Approved by the Cabinet of Ministers of Ukraine of March 1, 2007 N 303). The special project documentation should be prepared for each cases of afforestation for different periods of this activity according the demands of the low. These documentations may be used for demonstration of direction human-induced components.

ERT assessment
According to the IPCC GPG for LULUCF and in accordance with paragraph 8.(c) of the annex to decision 15/CMP.1: Parties shall report "*information that demonstrates that activities under Article 3, paragraph 3, began on or after 1 January 1990 and before 31 December of the last year of the commitment period, and are directly human-induced*", and demonstrate that activities reported under Art. 3.3 are directly human-induced, in order to distinguish units of land under Afforestation/Reforestation activities from areas subject to natural colonization.
In the ERT's view, **the provided response by the Party does not address the potential problem**. **In particular, no information has been supplied to demonstrate that all natural regeneration of forests is the consequence of direct human-induced activities or that a decision was taken to allow trees to grow as a promotion of natural seed sources on each unit of land reported under Afforestation and Reforestation activities** (see decision 16/CMP.1, para. 1).

The ERT considers this problem as unresolved.

#3 - Information on emissions and removals of greenhouse gases from lands harvested
In its 2010 submission, Ukraine did not provide information on emissions and removals of greenhouse gases from lands harvested during the first commitment period following afforestation and reforestation on these units of land since 1990. Therefore Ukraine is not meeting the mandatory reporting requirements stated in the Annex to Decision 15/CMP.1 (para.8.c).

Recommendation by the ERT:
The ERT recommends to provide the required information indicated above.

Response of Ukraine
Ukraine had conducted the calculation of greenhouse gases from lands harvested during the first commitment period following afforestation and reforestation on these units of land since 1990. The results of these calculations had showed in CRF-tables (5(KP-I)A.1.2) of submission 2010 and the information was presented in the NIR, chapter 11.3.1.1.

But Ukraine has started the special investigation for elaborating of the data base with the cartographic component. The data about lands harvested during the first commitment period following afforestation and reforestation on these units of land since 1990 will be included. In this document included data for the aim of the demonstration of Ukrainian capacity for

elaborating the systematically information base data according the requirements of the paragraph 8(c) of Decision 15/CMP.1. Ukraine has all aspect of necessary data but these only on the level of forestry.

At this moment Ukraine has conducted the questionnaires survey of Ukrainian forestries. Ukrainian national inventory system conducted the recalculations for KP-LULUCF activities and attached resubmissions results (CRF tables for LULUCF-KP) with recalculated results in table "5(KP-I)A.1.2".

ERT assessment
The ERT considers this issue addressed by the response of the Party and recommends Ukraine to report the given explanation in the next annual submission.

Inventory related potential problems

With reference to the inventory review guidelines under the Kyoto Protocol, the ERT requests that additional information and/or revised estimates for the 2008 greenhouse gas (GHG) inventory corresponding to the potential problems identified in this paper be forwarded to the ERT, through the UNFCCC secretariat, not later than by 18 October 2010.

Should Ukraine decide to submit by 18 October 2010, in response to some or all potential problems, revised estimates of its GHG emissions, the ERT requests that the revised estimates contain the following:

- Relevant background information and a descriptive summary of the revisions made by Ukraine in its 2010 inventory submission, in particular in the year 2008 with respect to CH_4 emissions from Natural Gas -Venting (1.B.2.c) from the Energy sector and HFCs, PFCs and SF_6 emissions from Consumption of Halocarbons and SF_6 from the Industrial Processes sector (see Attachment A);

- A complete resubmission of the 2010 CRF tables, reflecting the revised estimates through the Secretariat's web-portal;

- Ukraine's revision of the calculation of the commitment period reserve, based on the revised emissions reported for 2008, if the calculation of the commitment period reserve is based on the inventory data and not the assigned amount.

ATTACHMENT A

Overview of inventory potential problems identified for 2008

Annex A sources

2010 GHG inventory review

Ukraine

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
Energy, Oil and Natural Gas, Natural Gas - Venting (1.B.2.c)	CH_4	Level, Trend	X		

Description of problem identified:

The NIR states that the country specific emission factor (EF) for CH_4 emissions (6458 m3/km) for natural gas transmission (1.B.2.b.iii) includes all fugitive emissions related to this activity, and thus Ukraine reports Venting from gas transmission as NE in the CRF tables.

In response to a question raised by the ERT, Ukraine informed the ERT that in their opinion the country-specific EF covers both fugitive and venting emissions for natural gas transmission, citing language on natural gas production in Table 2.16 of the IPCC GPG. Thus in CRF tables, Venting emissions were reported as NE to avoid double-counting.

The ERT is of the view that the use of Ukraine's country-specific EF for fugitive emissions to also estimate venting emissions is not in line with the IPCC GPG in regards to estimating venting emissions from gas transmission. The ERT considers this case as an underestimation noting that the IPCC GPG Table 2-16 provides separate emission factors for fugitives and venting from gas transmission.

Recommendation by ERT:

1. Check that the activity (venting) does occur in Ukraine. If not, change notation key to not occurring (NO). Ukraine must provide information to substantiate that it does not occur Venting in the country.
2. Make sure that the emissions from Venting are not already included under any other category in the inventory. If so, change notation key to included elsewhere. Provide information demonstrating that the activity is included elsewhere (IE).
3. The ERT recommends that Ukraine calculate and report on venting CH_4 emissions from the gas transmission system using CS EF if available or GPG default EF for venting.

Response / Information by Party:

1. Ukraine checked activities associated with venting in Ukraine, and confirms that this type of activity (venting) takes place during the transmission of natural gas.
2. Ukraine confirms that in the official submission of 2010 emissions from venting during the transmission of natural gas are included in the category 1.B.2.b. Natural Gas - iii. Transmission. Utilization of the notation key NE in the category 1.B.2.c. Venting - ii. Gas is false and does not reflect this fact. It is correct to use the notation key IE within the category 1.B.2.c. Venting - ii. Gas with notification that the emissions estimation data are included into 1.B.2.b. Natural Gas - iii. Transmission.
3. Pursuant to the recommendations of the ERT regarding separation of emissions from natural gas transmission between the Fugitive and Venting (the categories 1. B. 2. b. Natural Gas - iii. Transmission and 1. B. 2. c. Venting - ii. Gas, respectively), and taking into account paragraph 2 above, Ukraine utilized the recommendations of section 2.7.1 GPG2000 and conducted quality control of initial data and methodological approaches.

For performing of quality control procedure an independent expert not involved in the development of the GHG Inventory from the profile inst itute (Institute of Gas of the National Academy of Sciences of Ukraine), Ph.D. Gurevich N.A. was engaged. Expert analyzed the open literature sources, national sectoral normative documents in the field of regulation of emissions during the natural gas transmission, as well as reports of the State gas transmission company Ukrtransgaz considering the equipment configuration, operating modes as well as consumption and losses of natural gas during its transmission. Quality control act is attached.

According to verification results, values of total methane emissions during natural gas transmission (category 1.B.2.b. Natural Gas - iii. Transmission) are in a good agreement with the independent evaluation data. Results of the comparison are given in the table below (Gg CH_4).

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
1.B.2.b. Natural Gas - iii. Transmission submission 2010	208.7	210.9	215.0	217.2	218.1	219.9	220.8	221.4	222.3	223.5	224.8
Expert judgement, Including	227.4	225.4	222.8	225.5	224.7	228.5	232.1	232.3	229.8	225.1	226.8
- Fugitive	106.5	107.7	110.1	111.3	111.6	112.4	112.8	113.4	113.9	114.5	114.5
- Venting	120.9	117.7	112.7	114.2	113.1	116.1	119.3	119.0	115.8	110.5	112.3
Difference	**8.2%**	**6.4%**	**3.5%**	**3.6%**	**2.9%**	**3.8%**	**4.9%**	**4.7%**	**3.3%**	**0.7%**	**0.9%**

The difference between the estimates from 2010 official submission and expert judgement is in the range of 0.7-8.2%, which is noticeably lower than the emissions uncertainty in the category as a whole (44%), as defined in Section 3.3.2.3 of NIR. Discrepancies found are also significantly lower than the evaluative range of data uncertainty (25-50%) concerning operation with gas, as defined in Section 2.7.1.6 GPG2000.

Taking into account the foregoing, Ukraine considers that data about emission estimations from category 1.B.2.b. Natural Gas - iii. Transmission that are presented in 2010 submission:

a) cover the methane emissions both Fugitive and Venting from natural gas transmission;

b) give an absolute estimate of emissions that is in a good agreement.

Ukraine, following the recommendations of ERT, conducted the allocation of data about emissions presented in the official submission in the category 1.B.2.b. Natural Gas - iii. Transmission per categories 1.B.2.b. Natural Gas - iii.

Transmission and 1.B.2.c. Venting - ii. Gas. Reallocated estimates are represented in the official resubmission.
Taking into account the minor discrepancies in the previously made estimations of emissions and the above mentioned estimates of the expert, which is absorbed by the uncertainty of estimations and following the general principles of the conservative emission estimations within the commitment period, Ukraine decided to recalculate and resubmit the emission data in these categories based on the expert opinion data.
Ukraine recalculate the emission data on period 1990-2008 for consistency.
Resubmission led to emissions increasing in the category 1.B.2 Fugitive Emissions from Oil, Natural Gas and Other Sources at 0.1-2 % for the period 1990-2008.

Potential problem unsolved? Rationale:

In considering the Ukrainian response, and reviewing the activity data, emission factors and total emissions now reported in the CRF, 17 October 2010 submission, the ERT considers this issue resolved.

Overview of inventory potential problems identified for 2008

Annex A sources

2010 GHG inventory review

Ukraine

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
Industrial processes, Consumption of Halocarbons and SF6, Refrigeration and air conditioning (2.F.1), Foam Blowing (2.F.2.), Fire extinguishers (2.F.3.), Aerosols/Metered dose inhalers (2.F.4.), Solvents (2.F.5)	HFCs, PFCs, SF_6	**Non-KC**	X		x

Description of problem identified:

Ukraine did not report neither actual nor potential emissions of HFCs, PFCs and SF_6 from air conditioning equipment (reported as NO - not occurring). The NIR of Ukraine's 2010 submission includes planned improvements to estimate emissions from air conditioning equipment in the next submission.

Ukraine did not report neither actual nor potential emissions of HFCs, PFCs and SF_6 from foam blowing, fire extinguishers, aerosols/metered dose inhalers and solvents under category Consumption of Halocarbons and SF_6.

Recommendation by ERT:

Check that the activity does occur in the country for all categories and relevant gases under Consumption of Halocarbons and SF_6, in particular for Refrigeration and Air Conditioning (2.F.1). If not, change notation keys to not occurring (NO). Ukraine must provide information to substantiate that it does not occur.
For the rest of activities under Consumption of Halocarbons and SF_6 that occur in the country, Ukraine should collect AD and estimate HFCs, PFCs and SF_6 emissions using the approaches recommended in Chapter 3.7 of the IPCC GPG.
The ERT notes that "Good practice is to use the Tier 2 actual method for all sub-source categories. If an inventory agency is unable to implement actual methods for all sub-source categories, it is good practice to calculate and report potential estimates for all sub-source categories."

Response / Information by Party:

Ukraine is not a producer of HFCs, PFCs and SF6. National GHG Inventory covers evaluation of GHG emissions in two categories: 2.F(a).1 Refrigeration and Air Conditioning Equipment and 2.F(a).8. Electrical Equipment.
Due to the lack of activity data, emissions in categories «Consumption of Halocarbons and SF6, Refrigeration and air conditioning (2.F.1), Foam Blowing (2.F.2.), Fire extinguishers (2.F.3.), Aerosols/Metered dose inhalers (2.F.4.), Solvents (2.F.5)» are not estimated. Investigations aimed at evaluation of activity data for above mentioned categories are planned to be executed at the expense of the AAUs sale (see Attachment B, Investigation #10).

Potential problem unsolved? Rationale:

The ERT has assessed the information provided by Ukraine to the above potential problem in response to the "Potential Problems and Further Questions from the ERT formulated in the course of the 2010 review of the greenhouse gas inventories". The ERT concluded that the information provided does not adequately correct the problem as no estimates were provided. The response that an investigation aimed at evaluation of activity data for categories which Ukraine has indicated the use of equipment which would lead to emissions, is not sufficient. Emissions from these categories were not estimated due to lack of data for a few years already, even though improvements were planned by Ukraine and moreover, considering that data collection shall be ensured by the national system as one of its general functions. **The potential problem is considered unresolved by the ERT.**

The ERT did provide advice on how to correct the problem, see section "Recommendation by ERT" above and Ukraine had an opportunity to correct the problem, however it did not provide missing estimates within the six weeks time frame as indicated in paragraph 74 of the annex to decision 22/CMP.1. **In accordance with the Article 8 review guidelines under the Kyoto Protocol the ERT will now initiate the adjustment procedure.**

Annex D: Response and comments of Ukraine on the Draft report of the individual review of the annual submission of Ukraine submitted in 2010, May 10, 2011

Response and comments of Ukraine on the Draft report of the individual review of the annual submission of Ukraine submitted in 2010

May 10, 2011

FOREWORD

The response and comments of Ukraine on the Draft report of the individual review of the annual submission of Ukraine submitted in 2010 are provided in accordance with paragraph 76 Article 3 part II of guidelines for review under Article 8 of the Kyoto Protocol adopted by decision 22/CMP.1.

The comments presented in the following format: first the original text of paragraph is cited as it appears in draft ARR (text is in black font), it is then followed by a response and comments from Ukraine to this paragraph (the text is highlighted in blue font). Furthermore, any citation of the draft ARR in Ukraine's responses appears in black font.

The following attachments constitute an integral part of Ukraine's response and comments:

File: Lime Production.xls

File: Energy sector activity data.pdf

Appendix: LULUCF tables attached at the end of the paper.

RESPONSES AND COMMENTS

ARR Page 7, Paragraph 6

6. The 2010 annual inventory submission was submitted on 12 April 2010 (national inventory report (NIR)) and 13 April 2010 (common reporting format (CRF) tables). It contains a complete set of CRF tables for the period 1990–2008 and an NIR. Ukraine resubmitted its CRF tables on 22 and 25 May 2010 and its NIR on 22 May 2010. Ukraine also submitted information required under Article 7, paragraph 1, of the Kyoto Protocol, including information on: activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, accounting of Kyoto Protocol units and changes in the national system and in the national registry. On 16 August 2010, Ukraine resubmitted information on accounting of Kyoto Protocol units, changes in the national system and further information on the national registry, and included information on the minimization of adverse impacts under Article 3, paragraph 14, of the Kyoto Protocol (part II of the NIR with revised and added chapters 12, 14, 15 and annex 6). The standard electronic format (SEF) tables were submitted on 12 April 2010 and resubmitted on 8 and 9 July 2010. The annual submission was submitted generally in accordance with decision 15/CMP.1.

Response:

Ukraine would like to note that Ukraine resubmitted its CRF tables on 22 and **26** May 2010. We therefore suggest to change the sentence "Ukraine resubmitted its CRF tables on 22 and 25 May 2010 and its NIR on 22 May 2010." to "Ukraine resubmitted its CRF tables on 22 and **26** May 2010 and its NIR on 22 May 2010".

ARR Page 8, Paragraphs 11 and 12

11. In its 2010 submission, Ukraine reported estimates for categories previously reported as "not estimated" ("NE") including: CO_2 emissions and removals from land converted to land-use categories other than forest land and SF_6 from electrical equipment. The ERT appreciates this improvement. However, there is still a long list of categories reported as "NE" in the GHG reporting of Ukraine. In response to questions raised by the ERT during the centralized review Ukraine noted that a number of the categories reported as "NE" had been put in a list of priority investigations for financing at the end of 2009 by the National Environmental Investment Agency (NEIA), but this plan had not been realized due to lack of finances caused by the continued economic crisis in the country. The ERT noted that categories reported by Ukraine as "NE" include: fugitive CO_2 and CH_4 emissions from oil exploration (and, when relevant, N_2O emissions); CO_2 emissions from oil production; CO_2 emissions from oil refining and storage; CO_2 and CH_4 emissions from oil venting; CO_2 and N_2O emissions from oil flaring (reported as "included elsewhere" ("IE")); CO_2 and CH_4 emissions from natural gas exploration, and CO_2 and CH_4 emissions from venting of natural gas; HFC, PFC and SF_6 emissions from foam blowing, fire extinguishers, aerosols/metered dose inhalers and solvents; CO_2 emissions from dead organic matter and mineral soils in forest land remaining forest land; CO_2, CH_4 and N_2O emissions from biomass burning on land converted to forest land, on land converted to cropland, on forest land converted to cropland, on grassland and on wetlands. The ERT strongly recommends that Ukraine include estimates for these categories in its next annual submission. The ERT noted that CO_2 emissions from natural gas transmission and HFC, PFC, and SF_6 emissions from refrigeration and air conditioning equipment (except for HFC-134a) are reported as "not occurring" ("NO"). The ERT considers that some of these emissions are likely to occur in the country and recommends that Ukraine revise its assumptions and report emissions from these categories in its next annual submission or provide in the NIR substantial explanations on the non-occurrence of these emissions.

12. As indicated above, Ukraine reported CH_4 emissions from venting of natural gas as "NE" in its 2010 submission. In response to the list of potential problems and further questions raised by the ERT, Ukraine provided revised estimates for this category (see paras. 48 and 49 below) after the centralized review. The ERT agreed with these emission estimates. In addition, Ukraine reported HFC, PFC and SF_6 emissions from foam blowing, fire extinguishers, aerosols/metered dose inhalers and solvents under the category consumption of halocarbons and SF_6 as "NO". During the centralized review the ERT recommended that Ukraine check whether these subcategories and other subcategories and relevant related gases under consumption of halocarbons and SF_6 occur in the country (in particular, for the subcategory refrigeration and air conditioning equipment) and provide estimates for those

categories and gases occurring in the country, in accordance with the IPCC good practice guidance. In response to the list of potential problems and further questions raised by the ERT, after the centralized review, Ukraine informed the ERT that, "due to the lack of activity data (AD), emissions in the categories refrigeration and air conditioning equipment, foam blowing, fire extinguishers, aerosols/metered dose inhalers and solvents are not estimated" and that "investigations aimed at evaluating the AD for these categories are planned to be executed at the expense of the assigned amount units (AAUs) sale". Taking this information into account and in accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol" (decision 22/CMP.1), the ERT decided to recommend adjustments for these categories (see paras. 98–125 below).

Response:

Ukraine appreciates the recommendations of the ERT and is in a position to inform the ERT that it has already incorporated the vast majority of the above-mentioned emissions estimates in its 2011 GHG inventory submission (NIR2011); specifically:

- CO_2 emissions from oil production,
- CO_2 and CH_4 from oil venting,
- CO_2 and N_2O emissions from oil flaring,
- CO_2 and CH_4 from venting of natural gas.

In addition, the 2011 GHG submission also incorporates CO_2 emissions from natural gas transmission.

Ukraine is in the process of estimating emissions of CO_2 and CH_4 from the exploration of oil and natural gas and to report these emissions to the secretariat as soon as practically possible.

In relation to CO_2 emissions from oil refining and storage, Ukraine would like to point out that there are not relevant EFs in the country and the IPCC GLs do not contain any default emission factors for estimating GHG emissions from this category. Ukraine will continue to work towards estimating these emissions and would appreciate any advice from the ERT on this particular issue.

Furthermore, in response to recommendations expressed by the ERT in paragraphs 11, 12, 33, 57, and 58, Ukraine prepared and presented in NIR2011 an estimate of emissions from the use of HFCs in the category "Refrigeration and Air Conditioning":

- from the use of HFC-410a in the equipment for a stationary air-conditioning [section 4.21.1.2 NIR2011], Tier 2a GPG2000 was applied;
- from the use of HFC-134a in vehicle air conditioning [section 4.21.1.3 NIR2011], Tier 2a GPG2000 was applied.

The national inventory team made inquiries with the Ukrainian customs service, however the information on imports recorded by them does not include composition of imported products. The importers in categories "Foam blowing", "Fire Extinguishers", "Aerosols" and "Solvents" appear to be numerous and dispersed. Thus it is effectively impossible to collect the relevant data in categories "Foam blowing", "Fire Extinguishers", "Aerosols" and "Solvents". Ukraine continues to work on methodology of data collection for the estimation emissions in afore-mentioned categories, inter alia from use a Metered Dose Inhalers for the treatment of asthma in the category "Aerosols".

Notwithstanding it, Ukraine has also estimated the potential emissions from HFCs and PFCs in the categories of "Foam blowing", "Fire Extinguishers" and "Aerosols" [sections 4.21.2 – pt. 4.21.4 NIR2011]. Estimation of GHG emissions in these categories was conducted using data from a group of countries with similar national conditions. The average volume of GHG emissions per capita was selected as an indicator.

Ukraine continues to work on data collection for the estimation emissions from:

- air conditioning systems and cooling systems of railway transport;
- metered dose inhalers for the treatment of asthma in the category "Aerosols".

and to report these emissions to the secretariat as soon as practically possible.

With regards to other categories of HFC, PFC and SF6 emissions, Ukraine does not have facilities producing these substances. Any emissions of HFC, PFC and SF6 that could potentially occur would occur from importation of goods containing these compounds. The national inventory team made inquiries with the Ukrainian customs service about the possibility of drawing activity data from their records, however the information on imports recorded by them does not include composition of imported products. The importers in categories "Foam blowing", "Fire Extinguishers", "Aerosols" and "Solvents" appear to be numerous and dispersed. Thus it is effectively impossible to collect the relevant activity data in categories "Foam blowing", "Fire

Extinguishers", "Aerosols" and "Solvents". Ukraine welcomes dialogue with ERT on how to construct missing actual emissions estimates.

ARR Page 9, Paragraph 14

14. The ERT concluded that the national system of Ukraine continued to perform most of its required functions in accordance with the annex to decision 19/CMP.1. However, the ERT noted that some general and specific functions of the national system are not fully operative; for example, most of recommendations made in the previous review report are still not addressed and the GHG inventory of Ukraine is not complete (see paras. 11–13 above). Furthermore, the ERT noted the lack of transparency in the descriptions of AD used for the energy and industrial processes sectors, particularly due to the absence of an energy balance (see para. 37 below) and a coke balance (which both were recommended to be provided in the previous review report), increased number of confidential AD in the industrial processes sector (see para. 57 below), as well as the lack of information and completeness in LULUCF and KP-LULUCF mandatory reporting (see paras. 79, 80, 82, 127 and 130 below). The ERT also noted that over the last few years Ukraine has not been able to collect the AD, process information and EFs necessary to estimate the relevant missing GHG emissions by sources and removals by sinks, as applicable. The ERT further noted that Ukraine has, in the past and current NIRs, consistently presented plans to estimate the missing GHG emissions, but these have not been implemented in its 2010 submission.

Response:

Comments of Ukraine on the issue of transparency are presented under general comments to paragraph 59. Ukraine suggests deleting reference to confidentiality being the reason for the lack of transparency as it would suggest the issue is in control of the inventory's developers. We therefore suggest to change the sentence "Furthermore, the ERT noted the lack of transparency in the descriptions of AD used for the energy and industrial processes sectors, particularly due to the absence of an energy balance (see para. 37 below) and a coke balance (which both were recommended to be provided in the previous review report), increased number of confidential AD in the industrial processes sector (see para. 57 below), as well as the lack of information and completeness in LULUCF and KP-LULUCF mandatory reporting (see paras. 79, 80, 82, 127 and 130 below)."

To

"However, the ERT noted that some general and specific functions of the national system are not fully operative; for example, most of recommendations made in the previous review report are still not addressed and the GHG inventory of Ukraine is not complete (see paras. 11.13 above). Furthermore, the ERT noted the lack of transparency in the descriptions of AD used for the energy and industrial processes sectors, particularly due to the absence of an energy balance (see para. 37 below) and a coke balance (which both were recommended to be provided in the previous review report), as well as the lack of information and completeness in LULUCF and KP-LULUCF mandatory reporting (see paras. 79, 80, 82, 127 and 130 below)."

ARR Page 12, Paragraph 24

24. The ERT noted that for the years 1991–1997 the inventory lacks complete data on fuel consumption by category, which the Party explained was caused by changes that occurred in the Ukrainian statistical system. For instance, in the CRF tables for this period AD, implied emission factors (IEFs) and emissions of liquid, solid, gaseous, other fuels and biomass from energy industries, manufacturing industries and construction, transport and other sectors are reported as "NE". The ERT strongly reiterates the recommendation from previous review reports that, in its next annual submission, Ukraine use the splicing techniques recommended in the IPCC good practice guidance to make the time series consistent, thus enhancing the comparability of the emission estimates.

Response:

Ukraine appreciates the recommendations of the ERT and is in a position to inform the ERT that it is already developing emissions estimates from these subcategories for 1991-1997. These estimates will be reported to the secretariat as soon as practicable.

ARR Page 12, Paragraph 28

28. However, the ERT noted that the reporting for the energy and industrial processes sectors still lacks transparency and a strong recommendation made in the previous review report, that the Party provide an energy balance and a coke balance, has not yet been implemented. The ERT notes that the transparency of the AD and EFs used in the industrial processes sector decreased in the 2010 submission, because limited information was provided for some categories due to the confidentiality of data, and also because of the aggregation of these categories with likely non-confidential categories, with no additional explanations on the increased confidentiality provided in the NIR (see para. 57 below). During the centralized review, in response to a question from the ERT regarding access to confidential data (e.g. carbide production, dolomite use), Ukraine explained that it is not possible for the country to make this information available and provided access to the "Law of Ukraine on State Statistics, with amendments and additions introduced by Law of Ukraine of 13 July 2000 No. 1922-III" (2006), which relates to the confidentiality of state statistics. According to this law, information on production values from industrial activities with limited number of plants remains confidential. The ERT noted that, in accordance with decisions 25/CMP.1 and 18/CP.10, Parties included in Annex I to the Convention (Annex I Parties) whose inventories contain information that is designated as confidential are requested to provide this information during centralized and in-country reviews, at the request of an ERT, in accordance with the code of practice for the treatment of confidential information adopted by decision 12/CP.9. After the centralized review, in its response to the ERT's list of potential problems and further questions, Ukraine agreed to provide the confidential information to the ERT. The ERT strongly recommends that Ukraine improve the transparency of the inventory in the industrial processes sector and provide the data in future reviews, at the request of the ERT.

Response:

Ukraine appreciates the recommendations of the ERT and is in a position to inform the ERT that it has developed the balance for coking coal, coke, coke oven gas and included it in the NIR2011, which was submitted to the Secretariat on 15 April.

On the issue of energy balance please see response to paragraph 38.

On the issue of confidentiality, Ukraine explained during the centralized review that due to reduction of economic activity in Ukraine in the aftermath of global economic crises, the number of producers in a significant number of emission categories reduced and these categories became confidential under the Law of Ukraine on State Statistics. The ERT was also provided with the list of the producers detailing that in all confidential categories the number of producers was less than 4, which is the threshold for reporting statistical data as confidential. The ERT noted that the number of the confidential categories increased, however it did not outline the specific circumstances as well as the fact that 2008 was the first year that Ukraine experienced such a dramatic change in the number of confidential categories (in previous submissions only one category (aluminium production) had been confidential).

Ukraine received requests from the ERT to provide the activity data for two confidential emission categories on 1 and 2 September 2010 – three and two days respectively before the completion of the centralized review. Ukraine's response was that this information can only be provided during the centralized review. We admit that the inventory expert's response was not clear as it made reference to an in-country review. Ukraine is of the view that this does not constitute a failure to provide confidential information under the relevant procedures. Under procedures on treatment of confidential information, when confidential information is requested, the Party informs the Secretariat in writing through a notification signed by the appropriate focal point, to which the Secretariat responds with a confirmation and an assurance that the information will be protected. The data is then mailed to the secretariat in printed format. By stating that the data could only be provided during the in-country review the inventory experts implied the fact that the centralized review was coming to an end on 04/09/2010 and that there was not sufficient time to ensure that the data would be made available to the ERT within the review time frame, i.e. while the ERT was still at the offices of the secretariat. In accordance with the UNFCCC confidentiality procedures, the ERT does not have access to confidential information after the week of the centralized review.

Furthermore, in a telephone conversation with a staff member of the Secretariat on either 2nd or 3rd September 2010, the inventory experts replied that Ukraine will consider this request. Consequently, on 18 October 2010, the inventory experts confirmed that Ukraine is ready to

provide the confidential data outside of the centralized review timeframe upon the formal request of the Secretariat.

We regret the miscommunication regarding access to confidential information and affirm that Ukraine did not have intention not to provide the confidential information. Ukraine accepts the strong recommendation by the ERT and is putting in place all necessary procedures (including additional training of our staff dealing with confidential data and ensuring that all national experts involved have a clear interpretation of the various CP and CMP decisions) to ensure that such a situation will not happen again in the future.

As regards the issue of aggregation of confidential categories, please see our response to para 59.

ARR Page 14, Paragraph 32

32. However, a number of strong recommendations in the previous review report have not yet been implemented, particularly those relating to the transparency of AD and EFs in the energy and industrial processes sectors, the provision of the energy and coke balances (see para. 42 below), and improvements required for LULUCF and KP-LULUCF reporting (e.g. ensuring a consistent land representation and identification of areas of KP-LULUCF activities in line with the IPCC good practice guidance for LULUCF and reporting of information on the geographical location of the areas used for calculation of the units of land subject to afforestation, reforestation, deforestation and forest management activities) (see paras. 127, 128 and 129 below). Furthermore, in the previous review report, Ukraine was recommended to verify its country-specific approach, based on the balance of nitrogen (N) fluxes, and to estimate emissions and removals from soils (preferably by comparing the current method with the tier 2 approach in the IPCC good practice guidance for LULUCF) for the key category cropland remaining cropland. The ERT strongly recommends that Ukraine address all the recommendations made in the current and previous review reports in its next annual submission.

Response:

Ukraine appreciates the recommendations of the ERT and is in a position to inform the ERT that it has developed the balance for coking coal, coke, coke oven gas and included it in the NIR2011, which was submitted to the Secretariat on 15 April.

On the issue of energy balance please see response to paragraph 38.

ARR Page 14, Paragraph 33

33. The 2010 NIR identifies several areas for improvement in the GHG inventory in the sectoral chapters. The ERT encourages Ukraine to also report planned improvements in chapter 10 of the NIR in the next annual submission. Improvements identified by the Party include:

(a) The development of country-specific EFs for a number of categories, such as CO_2 emissions from combustion of natural gas, fugitive emissions, CO_2 emissions from cement production, CO_2 emissions from limestone and dolomite use, CO_2 emissions from aluminium production, CO_2 emissions from ferroalloys, CO_2 emissions from adipic acid production, CO_2 and N_2O emissions from manure management and direct N_2O emissions from agricultural soils;

(b) The improvement of AD and parameters for a number of categories and activities, including ammonia production, refrigeration, SF_6 use in electrical equipment, N_2O use in medicine and wastewater handling; and the updating of the areas of forest land, cropland and grassland (areas of different soil types by climatic zone);

(c) The implementation of a national model for solid waste disposal on land and the use of higher tier methods for the estimation of emissions from road transportation.

Response:

Ukraine appreciates the recommendations of the ERT and would like to note that the NIR2010 already used the following national emission factors in category 1.B "Fugitive Emissions":

-Country-specific Tier 3 factors for emissions from coal mining;

-Country-specific emission factors for fugitive and venting emissions from transportation of natural gas;

- Country-specific emission factors for emissions from the distribution of natural gas.

The contribution of these subcategories constitutes about 72% of the total emissions in category 1.B in 2008. The only sub-category, which makes a significant contribution to emissions in category 1.B "Fugitive Emissions" and is estimated using the default emission factors is category 1.B.2.b.v "Other Leakage ", the share of which in 2008 was around 21% of the total emissions in category 1.B.

Furthermore, Ukraine would like to note that the NIR2010 did not envisage plans for improvement of CO_2 emissions from adipic acid production. At the same time in the category 2.B.3 planned to clarify the factors of destruction of N_2O and the use of N_2O abatement in the workplace.

Based on the above Ukraine propose to clarify wording in the final version of ARR2011 and present points (a) and (b) of paragraph 33 it as follows:

"(a) The development of country-specific EFs for a number of categories, such as CO2 emissions from combustion of natural gas, **fugitive CH4 emissions from end-users natural gas leakage,** CO2 emissions from cement production, CO2 emissions from limestone and dolomite use, CO2 emissions from aluminium production, CO2 emissions from ferroalloys, CO2 and N2O emissions from manure management and direct N2O emissions from agricultural soils;"

(b) The improvement of AD and parameters for a number of categories and activities, including ammonia production, **adipic acid production**, refrigeration, SF6 use in electrical equipment, N2O use in medicine and wastewater handling; and the updating of the areas of forest land, cropland and grassland (areas of different soil types by climatic zone)…"

ARR Page 16, Paragraph 38

38. Reporting of the energy sector in the NIR is not fully transparent. Annex 2 of the NIR provides description of methods, EFs and parameters (oxidation factors) used in the calculations. However, actual AD used in the emission calculations are not provided in the NIR; instead there is only a detailed description of national statistical forms and their use as data sources, including precise references to them and additional bibliographic references. An energy balance is not provided in the NIR nor is there detailed energy consumption data for the entire time series (1990–2008). Ukraine explained in the NIR that energy balances are lacking in the country, except for 1990. The ERT reiterates the recommendation made in previous review reports that Ukraine provide relevant information on the national energy balance, and use the splicing techniques recommended in the IPCC good practice guidance to make the time series consistent in its next annual submission, thus enhancing the comparability of emission estimates (see para. 23 above) in the NIR of its next annual submission. In addition, the ERT noted from the NIR that for all fuels, except hard coal, Ukraine uses default values for carbon content (CO_2 EFs) and oxidation factors, as well as default values for CH_4 and N_2O EFs. The ERT strongly recommends that Ukraine develop and use country-specific CO_2 EFs and oxidation factors in its estimates for its next annual submission. The ERT also encourages Ukraine to make the necessary efforts for developing and use country-specific CH_4 and N_2O EFs.

Response:

Ukraine appreciates the recommendations of the ERT and is in a position to inform the ERT that it is developing the estimation of emission at the level of subcategories for 1991-1997. These estimates will be reported to the secretariat as soon as practicable.

Ukraine is also developing emissions estimates from natural gas and coal combustion using national CO_2 emission factors. These estimates will be reported to the secretariat as soon as practicable.

The emission calculations for GHG emissions in the energy sector are based on the data collected at the national level using the statistical form 4-MTP (more details on the structure of this form is provided in the NIR (Annex 2 of NIR2010). The database used by the inventory team to aggregate energy consumption data includes direct records on fuel consumption submitted by all companies to the State Statistics committee. The statistical reporting also tracks net calorific values corresponding to the 20 different types of fuel used under specific economic activities directly from the reporting of individual enterprises (for other types of fuels either IPCC default values or

Ukrainian reference values are used). These data are also included in the database. The database is not aggregated, rather a software program performs the calculations and extracts information for the CRF and NIR.

The data collected by the State Statistics committee includes consumption of various types of fuels and the types of economic activities under which the fuels are consumed as defined by the Ukrainian economic activity classification (KVED) – similar to European NACE. The KVED categories allow the aggregation of the data into the IPCC source categories. The software automatically matches fuel consumption occurring in specific economic categories with corresponding net calorific values for every individual fuel. Thus, the highest level of aggregation that can be achieved to allow calculation on the basis of aggregated data is at the level of 48 categories of economic activities and 44 different types of fuel. It is a rather large data set and its inclusion in the NIR was not deemed feasible.

On the issue of energy balance, Ukraine tracks the data on production, imports, exports, stock change and consumption of various fuel types. However, at present these data are not used to create an energy balance for Ukraine. A national consultation process has been initiated (involving the State Statistics committee, the Ministry of Fuel and Energy, the GHG inventory team and other stakeholders) to address this issue for future submissions. The main purpose of this process is to harmonize the data that are being collected, used and reported by Ukraine both at national and international level. This applies specifically:

1. To the case of exports and imports of natural gas, where two different organizations collect relevant information;
2. To the use of a country-specific appropriate calorific value for natural gas;
3. To the case of coal, where it is necessary to ensure that the approach taken to determine stock changes is applied consistently.

Ukraine will report on the outcome of these consultations as soon as a final decision has been taken.

In relation to the comments in the review report referring to the lack of activity data used for the estimation of GHG emissions, Ukraine submits a table presenting aggregate fuel consumption data by fuel and by IPCC category (see attached file Energy sector activity data.pdf). This tables will also be incorporated in the next version of the NIR.

In addition, Ukraine is currently elaborating Annex 4 to the NIR in order to explain clearly the differences between the reference and sectoral approaches. These changes will be made in the next version of the NIR.

40. The NIR provides information on general QA/QC procedures and verification activities for the energy sector. However, there is no indication of the implementation of tier 2 quality control (QC) procedures for key categories in the sector in line with the IPCC good practice guidance. The ERT encourages Ukraine to continue to improve the implementation of QA/QC procedures and verification activities, in particular using tier 2 QC procedures for key categories and to provide the relevant information in the NIR of its next annual submission.

Response:

Ukraine appreciates the recommendations of the ERT and is in a position to inform the ERT that it is taken into account in the NIR 2011. Detailed tier 2 quality control procedures in key categories methane emissions from leakage during transportation of natural gas and coal mining were implemented accordingly (see Sections 3.3.1.4 and 3.3.2.4 of the report submitted by the Secretariat on 15 April).

ARR Page 18, Paragraph 47

47. The NIR provides a short description of feedstocks and non-energy use of fuels. The

ERT noted that some CO_2 emissions from feedstocks and non-energy use of fuels are reported under the industrial processes sector: CO_2 emissions from coke are reported under iron and steel production and CO_2 emissions from natural gas are reported under ammonia production. From the information provided in the NIR, the ERT could not conclude that there is no double counting between the energy and the industrial processes sectors. In addition, as indicated in previous review reports, the ERT noted that inconsistent information was provided on the consumption of coke in the energy and industrial processes sectors. In order to ensure that there is no double counting and that the emissions are reported in a transparent manner, the ERT recommends that Ukraine provide a mass balance of coking coal and coke and natural gas in its next annual submission. Also, the ERT reiterates the recommendation made in previous review reports that Ukraine provide further information on the method used to calculate and allocate emissions from coke production and use in its next annual submission.

Response:

Ukraine considered ERT's recommendation to improve transparency in emissions estimation in energy and industrial processes sectors in order to ensure that there is no double counting, please see our responses to paragraphs 64 and 65 for detailed comments.

Regarding ERT's recommendation that Ukraine provides a mass balance of coking coal and coke in its next annual submission, Ukraine is happy to report that it has complied with this request and has provided the balance for coking coal, coke, coke oven gas in NIR 2011 (Annex P2.8).

Ukraine is also developing a mass balance of natural gas. These estimates will be reported to the secretariat as soon as practicable.

ARR Page 19, Paragraph 50

50. The NIR states that the country-specific CH_4 EF (6,458 m^3/km) for natural gas transmission used in its calculations includes all fugitive emissions related to this activity and therefore Ukraine reports venting from natural gas as "NE" in CRF table 1.B.2. No further explanations were provided in the NIR about these assumptions. In response to a question raised by the ERT during the centralized review, Ukraine clarified to the ERT that the country-specific EF covers both fugitive and venting emissions for gas transmission, citing language in table 2.16 of the IPCC good practice guidance on natural gas production, and affirming that venting emissions were indicated as "NE" in the CRF tables to avoid double counting. The ERT noted that the use of Ukraine's country-specific EF for fugitive emissions to estimate gas transmission and venting CH_4 emissions is not in line with the IPCC good practice guidance, because table 2.16 provides separate EFs for fugitive emissions and venting from gas transmission. In its response to this remark Ukraine informed the ERT that the appropriate notation key for venting should be "IE". The ERT recommends that Ukraine use the appropriate notation key for venting of natural gas in its next annual submission, as well as check the proper use of notation keys for all categories and gases in accordance with the UNFCCC reporting guidelines.

Response:

Ukraine appreciates the recommendations of the ERT and is in a position to inform the ERT that it is taken into account in NIR2011. For separation of the emissions from transportation of natural gas into venting and fugitive, a recalculation was performed using an alternative approach proposed by an expert from the Institute of Gas of the National Academy of Sciences of Ukraine. Revised estimate of emissions was submitted by Ukraine in response to a list of potential problems. In accordance with paragraph 51 of the ARR, this resulted in an increase in emissions for the oil and natural gas category in 2008 of 43.56 Gg CO_2 eq (0.2 per cent). The ERT commends Ukraine for conducting this QC study and providing revised estimates based on its results and agrees with the revised estimates.

The ERT recommends that Ukraine use these data sources for future annual submissions and transparently document the methodology, EFs and AD used for the revise calculations. Given the very small difference (0.2 per cent) between the two approaches, Ukraine requests the deletion of: "the use of Ukraine's country-specific EF for fugitive emissions to estimate gas transmission and venting CH_4 emissions is not in line with the IPCC good practice guidance".

ARR Page 19, Paragraph 52

52. Ukraine uses the IPCC tier 1 method with default CH_4 EFs from the Revised 1996 IPCC Guidelines for the road transportation calculations. The ERT noted that the IEF for CH_4 for liquefied petroleum gas (LPG) in road transportation reported by Ukraine in the CRF tables is equivalent to that reported for natural gas and appears to be taken from the default EF for natural gas in table 1-7 of the Reference Manual of the Revised 1996 IPCC Guidelines (50 kg/TJ). This is not the correct EF to use for calculating CH_4 emissions from LPG used by road transportation, so the ERT recommends that Ukraine revise its approach in its next annual submission and instead use the appropriate LPG and natural gas CH_4 EFs, if possible using country-specific values or those as listed in tables 1-43 and 1-45 of the Revised 1996 IPCC Guidelines.

Response:

Ukraine appreciates the recommendations of the ERT and is in a position to inform the ERT that it is taken into account in NIR2011 submitted to the Secretariat on 15 April.

ARR Page 21, Paragraph 58

58. During the centralized review, the ERT recommended that Ukraine check whether these subcategories and other subcategories and relevant related gases under consumption of halocarbons and SF_6 occur in the country, in particular for the subcategory refrigeration and air conditioning equipment; and for those categories and gases occurring in the country provide estimates in accordance with the IPCC good practice guidance. In response to the list of potential problems and further questions raised by the ERT, after the centralized review Ukraine informed the ERT that, "due to the lack of activity data (AD), emissions in the categories refrigeration and air conditioning equipment, foam blowing, fire extinguishers, aerosols/metered dose inhalers and solvents are not estimated" and that "investigations aimed at evaluating the AD for these categories are planned to be executed at the expense of the AAUs sale". Taking this information into account and in accordance with the guidelines for review under Article 8 of the Kyoto Protocol, the ERT decided to recommend adjustments for these categories (see paras. 98–125 below).

Response:

Ukraine accepts the adjustments recommended by the ERT. With regards to estimation of emissions from consumption of halocarbons and SF6 in the categories recommended by ERT, to the extent possible, ERT's recommendations were taken into account by the inventory developers. Please see the details in comment to paragraph 11.

ARR Page 21, Paragraph 59

59. The ERT noted that Ukraine followed the recommendation of the previous review report and estimated CO_2 and CH_4 emissions from silicon carbide production. However, due to lack of transparency in the reporting, it was difficult for the ERT to assess the accuracy of the estimates. Ukraine reports as confidential ("C") the AD for 17 categories (soda ash use, asphalt roofing, glass production, nitric acid production, adipic acid production, calcium carbide, carbon black, ethylene, methanol, ferroalloys production, aluminium production and PFCs from aluminium production, as well as dolomite use, propylene, polypropylene, phthalic anhydride and polystyrene). The number of categories reported as "C" has increased since the previous submission. Emissions from these categories are aggregated in a manner which reduces the overall transparency of the industrial processes sector and makes it difficult for the ERT to assess the accuracy of the estimates in these categories. For example, emissions of CO_2 from asphalt roofing are reported as "NE" with AD reported as "C" and seem to be included under the aggregated category "ethylene and other production", as indicated in the documentation box of table 2(I).A-G, whereas CO_2 emissions for this aggregated category are reported as "NO". In other cases, such as CO_2 emissions from silicon carbide production, it is unclear if these emissions are included under an aggregated category, because the information in documentation box of table 2(I).A-G indicates that calcium carbide production is aggregated with soda ash use, but no reference is made to silicon carbide. At the same time, table 9(a) reports that CO_2 emissions from silicon carbide production are aggregated with soda ash use emissions, while CH_4 emissions from silicon carbide production are reported under the category "ethylene and other production". During the centralized review, in its responses to the questions from the ERT regarding access to confidential data, Ukraine explained that the AD used to estimate emissions in these categories are confidential and can only be provided during an in-country review and therefore did not provide the requested

information. Ukraine further explained with reference to the Law on State Statistics (see para. 27 above) that AD are considered confidential due to the limited number of enterprises in these categories. The ERT notes that, in accordance with decisions 25/CMP.1 and 18/CP.10, Annex I Parties whose inventories contain information that is designated as confidential are requested to provide this information during centralized and in-country reviews, at the request of an ERT, in accordance with the code of practice for the treatment of confidential information adopted by decision 12/CP.9. The ERT strongly recommends that Ukraine aggregate emissions in a coherent and systematic way so that emissions corresponding to confidential categories are grouped under the same category where their AD are reported, that fewer categories are reported as confidential and allow provision of data in future reviews at the request of ERT.

Response:

With regard to the provision of confidential information Ukraine reiterates the significant challenge it faced when coping with the sudden increase of the number of confidential categories. Following the ERT's recommendations, the inventory developers obtained activity data from alternative sources (including publicly-available data), emissions for which have been reported in the 2011 inventory submission. This is related to 5 inventory activities categories: soda consumption, nitric acid, adipic acid, carbon black, ethylene. The activity data for these categories remain confidential. In the 2011 inventory submission, the inventory developers also succeeded in disaggregating data on emissions from nitric and adipic acid production which were previously aggregated due to the confidentiality of the activity data for adipic acid production. As a result both emission data and activity data in the category 2.B.2 "Nitric Acid production" are currently non-confidential.

Unfortunately, there is still a number of categories that remain confidential. As previously, in cases when default emission factors are used (i.e. inventory of non-key sources of emissions), the provision of information on greenhouse gas emissions separately for each category does not allow maintaining the confidentiality of the data. To ensure confidentiality of the data in these cases we combined emissions from several categories with the same set of greenhouse gas emissions. These cases include:

- CO_2 emissions in the production of aluminum and alloys (aggregated into Category 2.C.5);
- CO_2 emissions in the production of calcium carbide and silicon (aggregated in the category 2.B.5);
- CH_4 emissions in the production of silicon carbide and methanol (aggregated in the category 2.B.5.5);
- emissions of precursors in the manufacture of asphalt roofing, propylene, polypropylene, polystyrene, polyethylene, phthalic anhydride, aluminum, and adipic acid (aggregated in the category 2.B.5).

We are aware that this way of aggregation might not be perfect, however we do not currently see how the confidential data can be disaggregated without compromising their confidentiality. We are open to discuss potential solutions with the ERT during the up-coming in-country review. Further, to enhance comprehensiveness of the NIR, the description of the activity data and EFs has been extended (production of nitric and adipic acids).

Specific comments on the text:

- We suggest replacing sentence "However, due to lack of transparency in the reporting, it was difficult for the ERT to assess the accuracy of the estimates." with "However, due to confidentiality of activity data for some inventory activities, it was difficult for the ERT to assess the accuracy of the estimates." as it would more correctly describe the type of difficulties ERT encounted during the centralized review. Overall, we would like to stress that confidentiality of the data does not equal non lack of transparency.

- Ukraine requests that the sentence "The number of categories reported as "C" has increased since the previous submission." is completed as follows: "The number of categories reported as ."C" has increased since the previous submission. During the centralized review, Ukraine explained that this was due to reduction in the number of producers as a result of the economic crisis." While the language in paragraph 28 and 59 appears to suggests that Ukraine arbitrary imposed confidentiality on a number of emission categories, during the centralized review Ukraine explained that confidentiality provisions are imposed by the Law of Ukraine on Statistics once the

number of producers drops below a certain minimum threshold, and further clarified in a phone with staff member of the Secretariat that the drop in the number of producers was due to the economic crisis. As no further inquiries were made by the ERT we consider that the ERT received and was satisfied with the information.

- While Ukraine is happy to continue looking for opportunities to clarify confidential data categories when alternative open-source data are available, Ukraine would like to request deletion of ERT's recommendation "that fewer categories are reported as confidential" as the rules for confidentiality of the data are outside of the inventory developer's control.

- As regards the references to the treatment of CO_2 emissions from silicon carbide, Ukraine clarifies that table 2(I).A-G in cell {G;25} ("Comments") with reference to notation IE in relation to CO_2 emissions from silicon carbide clearly states "Included in 2.B.5 "Soda Ash Use and Carbide Production and Use". Furthermore section 4.12.1 of the NIR states: "The data on silicon carbide production in Ukraine are confidential. Therefore the results of the assessment of CO_2 emissions from silicon carbide production in Ukraine are aggregated with CO_2 emissions from soda ash use and are provided in the category 2.B.5 "Soda ash use, production and use of calcium carbide". We accept that this clarification in table 2(I).A-G was made in cell "Comments" and not in cells "Allocation per IPCC Guidelines" and "Allocation used by Parties", however we do not believe that this omission in any way makes it unclear where the CO_2 emissions from silicon carbide production are estimated. Therefore, we request deletion of the following passage from paragraph 59: "In other cases, such as CO2 emissions from silicon carbide production, it is unclear if these emissions are included under an aggregated category, because the information in documentation box of table 2(I).A-G indicates that calcium carbide production is aggregated with soda ash use, but no reference is made to silicon carbide. At the same time, table 9(a) reports that CO2 emissions from silicon carbide production are aggregated with soda ash use emissions, while CH4 emissions from silicon carbide production are reported under the category .ethylene and other production."

ARR Page 22, Paragraph 60

60. The ERT noted that for 1990–2003 data for lime production disaggregated into types of lime were not available and the country-specific ratio for hydrated/quicklime of 2004 (55/45) was used for all these years. However, since 2004, data disaggregated by type of lime have been available and applied, resulting in some CO_2 IEF fluctuations after 2004 (0.6–2.5%). However, these data were not provided in the NIR. During the centralized review, Ukraine provided to the ERT the country-specific ratios used, showing that they are consistent with the 1990–2003 time series. The ERT recommends that Ukraine include data on hydrated/quicklime production in the NIR of its next annual submission to increase the transparency of the report.

Response:

Ukraine appreciates the recommendations of the ERT and is in a position to inform the ERT that information in relation to the lime and hydrated lime production in Ukraine for key years it will be reported to the secretariat as soon as practicable (by May 26 2011).

ARR Page 22, Paragraph 61

61. According to the explanations in the NIR, the IPCC tier 2 method with default EFs was used. However, the CRF tables report an IEF of 0.6526 t/t for lime production in 2008, which is lower than the default values (0.75 t/t for high-calcium quicklime and 0.86 t/t for dolomitic lime). The ERT considers that, in the CRF tables, Ukraine reported total lime production as AD even though emissions were estimated using a default 0.97 correction factor for hydrated lime, as recommended in the IPCC good practice guidance. The ERT recommends that Ukraine check the AD and EFs used for the estimation of emissions and the correct application of the IPCC method for its next annual submission.

Response:

Ukraine confirms that it used IPCC tier 2 method with default EFs. In CRF tables, Ukraine reported total lime production as AD (without adjustments using a correction factor for hydrated lime), which we believe is a common practice among other reporting countries. When calculating GHG emissions, Ukraine used country-specific adjustments of the correction factor for hydrated lime. From 2004 onwards Ukraine records the statistics of hydrated and regular lime separately, the

volume of hydrated lime produced varied from 45% to 55%. The correction factor is therefore calculated on the basis of the actual hydrated lime volumes (CF=1 - 0.28*hydrated lime volume). Applied EFs for calcinated and dolomite lime are default IPCC values. This calculation is explained in the NIR2010. To assist the ERT in assessing the information provided by Ukraine, we have prepared an overview table with the relevant calculation (please see attached the file **Lime Production.xls**). It demonstrates that emission estimation presented in the NIR 2010 is correct. However, to improve the quality of the NIR2011, Ukraine will also provide a table with the data on volumes of hydrated lime produced in 2005-2009 and correspondingly calculated country-specific correction factors in its NIR2011 submission. As demonstrated in the attached table, if the adjusted AD are used the IEF is 0.7665 t/t, which is within the range of the IPCC. Ukraine kindly requests the advise of the ERT on how to report AD (total productions or adjusted production) in future submissions.

Accordingly, we suggest that paragraph 61 of the draft ARR2010 is rephrased as follows:

«According to the explanations in the NIR, the IPCC tier 2 method with default EFs was used. However, the CRF tables report an IEF of 0.6526 t/t for lime production in 2008, which is lower than the default values (0.75 t/t for high-calcium quicklime and 0.86 t/t for dolomitic lime). The ERT understood, and Ukraine confirmed, that in the CRF tables, Ukraine reported total lime production as AD, without adjusting it for hydrated lime, which explains the low IEF. Ukraine used a country-specific correction factor for hydrated lime, as recommended by the IPCC good practice guidance. The data on country-specific volumes if hydrated lime production for the calculation of the correction factors were not presented in the NIR but were provided to the ERT. The ERT recommends that Ukraine provides a more detailed description of the calculation methods and AD used in its next annual submission ».

ARR Page 22, Paragraph 62

62. The NIR explains that Ukraine estimated emissions from limestone and dolomite use in metal production and glass production. However, the CRF tables present only limestone use as AD under this category. During the centralized review, in its response to the ERT questions regarding the provision of data on dolomite use, Ukraine explained that because glass production is confidential, dolomite data are also confidential and thus cannot be reported or provided. This exclusion of the amount of dolomite used led to a higher CO_2 IEF (0.4845 t/t), although default EFs were used to estimate emissions (0.440 t/t for limestone and 0.477 t/t for dolomite). The ERT recommends that Ukraine report the total amount of limestone and dolomite used as AD in the CRF tables of its next annual submission to increase transparency and comparability regarding IEFs.

Response:

Ukraine appreciates the recommendations of the ERT and is in a position to inform the ERT that information about the use of Limestone and Dolomite is taken into account in NIR2011. Information about the GHG emissions at the Glass Production as a separate line it will be reported to the secretariat as soon as practicable (before May 26 2011).

ARR Page 22, Paragraph 63

63. The ERT noted a mistake in the estimation of total consumption of limestone in table 4.2 of the NIR, which might have led to an underestimation of emissions. However, during the centralized review, Ukraine explained to the ERT that although the data for export had been put into the rows for import and vice versa, the resulting figures were not affected. The ERT recommends that Ukraine improve its QC procedures and report the correct AD on limestone use in its next annual submission.

Response:

Ukraine appreciates the recommendations of the ERT and is in a position to inform the ERT that it is taken into account in the NIR2011 submitted to the Secretariat on 15 April 2011.

ARR Page 23, Paragraph 64

64. Ukraine used the amount of natural gas feedstock to estimate emissions from

ammonia production, which is in line with the IPCC good practice guidance. The ERT noted that the CO_2 IEF reported by Ukraine in 2008 (2.19 t/t) is higher than the IPCC default values (1.5 and 1.6 t/t) although the value had decreased from 2.45 t/t to 2.19 t/t over the period 1990–2008. The ERT also noted that CO_2 emissions from both the energy use for the ammonia production process and for the feedstock consumption of natural gas are reported under this category. This is not in line with the IPCC good practice guidance. As AD are collected directly from producers, the ERT considers that energy and non- energy use of natural gas could have been separated. The ERT recommends that Ukraine report emissions from natural gas used as fuel for ammonia production under the energy sector in its next annual submission.

Response:

Paragraph 64 of the ARR states: «The ERT also noted that CO_2 emissions from both the energy use for the ammonia production process and for the feedstock consumption of natural gas are reported under this category. This is not in line with the IPCC good practice guidance».

In response, Ukraine would like to stress that, to our knowledge, the IPCC GPG does not contain any guidance on this specific activity. On the issue of whether emissions should be estimated under energy or industrial processes, Page 1.8 of Volume 1 of the 1996 IPCC GLs states:

"Emissions from fuel combustion in industry should be reported under Energy. In instances where industrial process emissions result jointly from chemical processes and fuel combustion it may be difficult to assign the emission(s) to either sector. Where the main purpose of the fuel combustion is to use the heat released, the resulting emissions should be assigned to the Energy sector."

In the process of ammonia production the natural gas is used as feedstock and fuel. In our view as the main purpose of the process is the production of ammonia, it is acceptable under 1996 IPCC GL to report all emissions from natural gas use in ammonia production under the Industrial Process category.

Our interpretation of this issue is reinforced by the 2006 IPCC GL, which state:

"In order to avoid double counting, the total quantities of oil or gas used (fuel plus feedstock) in ammonia production must be subtracted from the quantity reported under energy use in the Energy Sector." (Page 3.16)

Also IPCC good practice guidance requires a country to make sure that emissions are not double-counted. According to the section 3.1 (Page 3.10) of IPCC GPG "to avoid double-counting or omissions of carbon dioxide (CO_2), the compilers of energy and industry-related emissions should cooperate closely and compare their basic fuel use data.". The NIR2010 fulfilled this requirement, as indicated in section 3.2.8.4 Quality Assurance and Quality Control (Energy Sector) of NIR2010: "to avoid double counting when using natural gas commodity needs of the joint analysis was conducted in the categories "Chemical Industry" (CRF category 1.A.2.c) and" Production of Ammonia" (CRF category 2.A.1)."

Section 4.9.2 Methodological Issues of the NIR 2010 (Page 91) explains specifically why the double-counting is avoided:

"In the same way, un-separated statistical data on natural gas use are given in first row of the 4th section of 4-MTP statistical form (sector "Production of fertilizers and nitrogen compounds, sector code 24.15). The aforementioned statistical data are not taken into account when compiling the energy sector inventory. Therefore double-counting of emissions from ammonia production (in industrial processes and energy sectors) does not occur".

Yet another reference on the avoidance of double-counting is made on ARR Page 56 of the NIR2010 in section 3.2.3 Fuel use as feedstock and non-energy fuel use:

"Emissions in the category "Fuel Combustion" reflect emissions from fuel combustion for purposes of heat and electricity production, in technological processes, transportation, and etc. However, fuel is also used for non-energy purposes (for example, as solvents, lubricants, etc.; as feedstock for production of ammonia, rubber, plastics, etc.; as a reducing agent – i.e. coke in blast furnaces). Emissions from non-energy use of fuels are presented in the sector "Industrial processes" in the following categories:

- Ammonia production (category 2.B.1 CRF) - Natural gas as feedstock in ammonia

production;

- Production of pig iron (category 2.C.1.2 CRF) - coke in the production of pig iron in blast furnaces".

Furthermore, double-counting is made impossible by the fact that fuel use in cases such as natural gas consumption in ammonia production is reported in the form 4-mpt as "non-energy use". Categories marked as "non-energy use" in 4-mpt are not included in the algorithm for estimation of energy sector emissions as explanation in Annex II of the NIR 2010.

Further, paragraph 64 of the ARR states:

"As AD are collected directly from producers, the ERT considers that energy and non-energy use of natural gas could have been separated".

Ukraine would like to stress that this does not reflect correctly the situation regarding AD for ammonia production. The information Ukraine receives from producers is based on official annual activity records of 6 ammonia production facilities in Ukraine: 3 of them report energy and non-energy use of natural gas separately and 3 of them do not separate energy and non-energy use of natural gas. Inventory compilers understand that natural gas is supplied to the production facilities though a single supply line, which is then diverted into different input chambers. Ability of the production facility to estimate consumption of natural gas separately for energy and non-energy use depends on whether the production facility has installed counters of natural gas use on different sections of the supply line after its split.

The inventory team is unable to influence the way the companies' consumption of gas is recorded and reported. Ukraine is happy to provide to ERT evidence of AD reporting practice in the form of the companies' annual activity records during the up-coming in-country review of its 2011 inventory submission.

Additionally, paragraph 64 of the ARR notes:

"The ERT noted that the CO_2 IEF reported by Ukraine in 2008 (2.19 t/t) is higher than the IPCC default values (1.5 and 1.6 t/t) although the value had decreased from 2.45 t/t to 2.19 t/t over the period 1990-2008".

Revised 1996 IPCC Guidelines, when providing the IEF IPCC default values of 1.6 t/t make reference to Jaques, 1992 (Jaques, A.P., Canada's Greenhouse Gas Emissions: Estimates for 1990. Environment Canada Report EPS 5/AP/4., 1992). Further analysis of the Canadian experience on the basis of the data in «Canadian ammonia producers : benchmarking energy efficiency and carbon dioxide emissions / prepared for the Canadian Fertilizer Institute and Natural Resources Canada», 2008 («Benchmarking energy efficiency», 2008) revealed that in 2000 the overall CO_2 emission factor from ammonia production at the plants in Canada (including both raw materials and fuel components) ranged «from 1.66 to 1.98 t CO_2/t NH_3 for the natural gas feedstock ammonia plants». At the same time, it is stated: "The variability is primarily due to the energy efficiency of the plant and, to a lesser extent, the carbon content of the feedstock and fuel".

Unfortunately, the low efficiency of the Ukrainian enterprises leads to an even greater value in CO_2 emissions in the production of ammonia (up to 2,19 t CO_2/ t NH_3 in 2008). However, this is not out of line with emission rates in other countries in Europe. According to Table 2.3 of «Synthesis and assessment report on the greenhouse gas inventories submitted in 2010" in Germany this quantity is 2,38 t CO2 / t NH3, in the Czech Republic - 2,4, and in Hungary - 2,44. The value of the national CO2 emission factor for ammonia production in Ukraine in 2008 is also comparable to the new default EF value of 2,104 t CO_2/ t NH_3 provided in 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Table 3.1) as average European values of specific consumption of natural gas (for the modern and old plants).

On the basis of all of the above, Ukraine suggested that paragraph 64 of the draft ARR is rephrased as follows:

« Ukraine used the amount of natural gas to estimate emissions from ammonia production, which is in line with the IPCC good practice guidance. The ERT noted that the CO_2 IEF reported by Ukraine in 2008 (2.19 t/t) is higher than the IPCC default values (1.5 and 1.6 t/t) although the value had decreased from 2.45 t/t to 2.19 t/t over the period 1990-2008. However, the ERT notes that the CO_2 IEF reported by Ukraine is comparable with the CO_2 IEF reported in the same category by other countries in Europe. The ERT also noted that CO_2 emissions from both the

energy use for the ammonia production process and for the feedstock consumption of natural gas are reported under this category. The ERT considers it acceptable under the IPCC good practice guidance ».

ARR Page 23, Paragraph 65

65. Ukraine used the tier 2 method with IPCC default EFs and country-specific parameters (e.g. carbon content in coke and pig iron) to estimate CO_2 emissions from iron and steel production. The ERT noted that table 4.5 of the NIR reports that 8,865.5 Mt of coke was used as a reducing agent in pig iron production and 9,018.6 Mt of coke was used as fuel. However, even though disaggregated AD on coke use is available, all CO_2 emissions from coke use for both energy and non-energy purposes in iron and steel are reported under this category, which is not fully in line with the IPCC good practice guidance. The ERT recommends that Ukraine report emissions from coke used for energy for iron and steel production under the energy sector and strongly reiterates the recommendation of previous review reports that Ukraine provide a coke balance (carbon in coke) to increase the transparency of the estimates in its next annual submission and ensure that there is no double counting or omission of emissions.

Response:

Ukraine considered ERT's recommendation to account for the emissions from coke used for energy in iron and steel production under the energy sector and would like to note the following.

Section 2.1.1.4 of GPG2000 states:

"The reporting of emissions from coke use in blast furnaces requires attention. Crude (or pig) iron is typically produced by the reduction of iron oxides ores in a blast furnace, using the carbon in coke (sometimes other reducing agents) as both the fuel and reducing agent. Since the primary purpose of coke oxidation is to produce pig iron, the emissions should be considered as coming from an industrial process if a detailed calculation of industrial emissions is being undertaken. It is important not to double-count the carbon from the consumption of coke or other fuels. So, if these emissions have been included in the Industrial Processes sector, they should not be included in the Energy sector».

Section 3.1.3.1 of GPG 2000 states: «Carbon plays the dual role of fuel and reductant. It is important not to double-count the carbon from the consumption of coke or other reducing agents if this is already accounted for as fuel consumption in the Energy Sector. Since the primary purpose of carbon oxidation is to reduce iron oxide ore to crude or pig iron (carbon is used as a reducing agent), the emissions are considered to be industrial processes emissions, and they should be preferably reported as such».

Based on the above, Ukraine believes that the IPCC methodological guidance points to the accounting of the CO_2 emissions from the use of coke in steel or pig iron production as industrial process emissions. At the same time it is importance to ensure there is no double counting of such emissions (in the Energy Sector and in Industrial Processes Sector).

On the issue of double counting, the absence of double counting when accounting for emissions from the use of coke for iron and steel production in NIR2010 referred to five times:

1) On Page 97: «In order to prevent double counting, balance of production and consumption of coke in Ukraine for 2006-2008 was developed on the basis of statistical reporting. In constructing this balance, the inventory developers used data on production, exports, imports and consumption of coke in Ukraine, as well as on balances of coke at the end and beginning of the year. The absence of double-counting of coke as a whole in Ukraine is also evidenced by the description of the software algorithm for calculating GHG emissions in the sector "Energy" (Annex 2). One of the exceptions in this algorithm is exclusion of the accounting for the use of coke in the industrial production (column 3 of Section 4 of the form 4-mtp) for economic activities with codes of 27.1 ("Production of pig iron, steel and ferroalloys). In this case, all GHG emissions from the use of coke for iron production are taken into account in the sector "Industrial processes" in the category of "Production of pig iron" (CRF category 2.C.1.2).

2) On Page 54: "Emissions in the category "Fuel Combustion" reflect emissions from fuel combustion for purposes of heat and electricity production, in technological processes, transportation, and etc. However, fuel is also used for non-energy purposes (for example, as

solvents, lubricants, etc.; as feedstock for production of ammonia, rubber, plastics, etc.; as a reducing agent – i.e. coke in blast furnaces). Emissions from non-energy use of fuels are presented in the sector "Industrial processes "in the following categories:

- Ammonia production (category 2.B.1 CRF) - Natural gas as feedstock in ammonia production;
- Production of pig iron (category 2.C.1.2 CRF) - coke in the production of pig iron in blast furnaces."

3) On Page 62: "It should be noted that emissions associated with metallurgical coke in the blast furnace process are reflected in the sector "Industrial processes ".

4) On Page 96: "Production of pig iron involves reduction of the iron ore, mainly in blast furnaces. The carbon contained in the coke is used both as fuel and as a reductant. In the current inventory, all emissions of CO_2 from the use of coke in iron are accounted for as CO_2 emissions in the industry. "

5) On Page 109: "In order to prevent double counting, balance of production and consumption of coke in Ukraine for 2006-2008 was developed on the basis of statistical reporting. In constructing this balance, the inventory developers used data on production, exports, imports and consumption of coke in Ukraine, as well as on balances of coke at the end and beginning of the year. The absence of double-counting of coke as a whole in Ukraine is also evidenced by the description of the software algorithm for calculating GHG emissions in the sector "Energy" (Annex 2). One of the exceptions in this algorithm is exclusion of the accounting for the use of coke in the industrial production (column 3 of Section 4 of the form 4-mtp) for economic activities with codes of 27.1 ("Production of pig iron, steel and ferroalloys"). In this case, all GHG emissions from the use of coke for iron production are taken into account in the sector "Industrial processes" in the category of "Production of pig iron (CRF category 2.C.1.2)."

Based on the above, Ukraine suggests that paragraph 65 of the ARR is rephrased as follows:

«Ukraine used the tier 2 method with IPCC default EFs and country-specific parameters (e.g. carbon content in coke and pig iron) to estimate CO_2 emissions from iron and steel production. The ERT noted that table 4.5 of the NIR reports that 8,865.5 Mt of coke was used as a reducing agent in pig iron production and 9,018.6 Mt of coke was used as fuel. It also noted that all CO_2 emissions from coke use for both energy and non-energy purposes in blast furnaces are reported under this category. The ERT strongly reiterates the recommendation of previous review reports that Ukraine provide a coke balance (carbon in coke) to increase the transparency of the estimates in its next annual submission and ensure that there is no double counting or omission of emissions».

Regarding, ERT's recommendation that Ukraine provides a coke balance in its next annual submission, Ukraine is happy to report that it has complied with this request and has provided coke balance in the NIR 2011 (Annex P2.8).

ARR Page 23, Paragraph 66

66. Ukraine reports that the AD for silicon carbide and soda ash production are confidential. CRF table 2(I).A-G reports aggregated CO_2 emissions for soda ash use and carbide production (both silicon and calcium, as explained in the NIR). CH_4 emissions from silicon carbide production are reported under the aggregated category ethylene and other production, but the AD for this category do not include silicon carbide production. The NIR provides methodological explanations only for calcium carbide production and use. The ERT concluded that the reporting of emissions from carbide production is not transparent and not in line with the IPCC good practice guidance, and the fact that the categories were not aggregated in a systematic way makes it difficult for the ERT to assess the consistency, comparability and accuracy of estimates. The ERT recommends that Ukraine improve the transparency and appropriateness of the reporting by including all relevant explanations and any other appropriate information in the NIR of its next annual submission.

Response:

Silicon carbide production statistics are confidential. Since silicon carbide production is the only process in category 2.B.4 "Carbide Production" that results in CH_4 emissions (estimated using a default emission factor), it was not possible to report these emissions under that category as it would have compromised the confidentiality of the data. The inventory developers chose to show the CH4 emissions from silicon carbide production together with CH4 emissions from methanol

production. With regards to ERT's statement that "the reporting of emissions from carbide production is not transparent and not in line with the IPCC good practice guidance", Ukraine reiterates that: (1) it is impossible to make reporting of confidential data completely transparent without compromising their confidentiality, (2) to our knowledge, there is no specific guidance in the IPCC good practice guidance on the aggregation of confidential data. We therefore suggest the deletion of the aforementioned statement.

With regards to the ERT's recommendations, Ukraine is happy to report that in 2011 inventory submission Ukraine was able to mitigate somewhat the confidentiality concerns over the data on soda ash use and list some emission estimates as non-confidential, while maintaining the confidentiality of the activity data.

ARR Pages 24-26. Paragraph 71, 72, 75, 76, 79

71. In general, descriptions of the AD, methodologies and EFs used which are provided in the NIR are transparent, but there was not sufficient information on the methodologies used to estimate country-specific EFs. Ukraine has implemented most of the recommendations made in the previous review report regarding transparency. However, the ERT noted that explanations on fluctuations of emissions time series are still lacking in the NIR. Thus the ERT recommends that Ukraine provide justifiable explanations on fluctuations of emissions time series with supporting charts or tables when necessary in its next annual submission.

72. There is no descriptive information on uncertainty analysis or on the methodologies used for calculating the uncertainties of estimates performed using tier 3 methods for CH_4 emissions from enteric fermentation, even though it was recommended in the previous review report to provide such information. Therefore the ERT reiterates that this recommendation be implemented in Ukraine's next annual submission.

Response:

Ukraine appreciates the recommendations of the ERT and is in a position to inform the ERT that it it will be reported to the secretariat as soon as practicable (by May 26 2011).

ARR Page 24, Paragraph 73

73. Recalculations performed in the 2010 submission relate to the use of updated AD for all types of animal populations, cultivated and harvested areas, nitrogen (N) fixed by N- fixing crops, area of organic soils, national allocation of manure for sheep, horses and goats to AWMS and the inclusion of emissions from by-products in the inventory. These recalculations resulted in an increase in emissions from the agriculture sector of 0.9 per cent in 1990 and an increase of 13.2 per cent in 2007. Also, the recalculation led to an increase in total emissions of 0.05 per cent (with and without LULUCF) in 1990 and an increase of 0.78 per cent excluding LULUCF and 0.88 per cent including LULUCF in the year 2007. The ERT noted that Ukraine reports in the NIR the result of recalculations as a change, but it did not indicate whether the recalculations result in a decrease or an increase in emissions. The ERT recommends that, in its next annual submission, Ukraine report clearly and accurately the increase or decrease resulting from the recalculations for categories and for the sector, as well as the impact on the national total.

Response:

Ukraine appreciates the recommendation of the ERT and is in a position to inform the ERT that it is partly taken into account in NIR2011 in the April 15 submission and will be supplemented as soon as practicable.

ARR Page 26, Paragraph 81

81. The ERT noted that land representation remains a critical issue for the Party's reporting for the LULUCF sector. Discrepancies were identified between land-use areas reported in the NIR and those reported in the CRF tables. In response to a question raised by the ERT during the centralized review, Ukraine clarified that different sources of information were used to identify land-use areas (annual statistics form "6-zem" and form "3-lg" concerning reforestation area). Regional land-use area assessments have been carried out and reported in the NIR (table П3.2.4) but the ERT noted that the national land representation seems to be inconsistent, as double counting or omission of an area might have occurred, leading to the incorrect estimation of emissions or removals. In response to a question raised by

the ERT during the centralized review, Ukraine stated that, in its next annual submission, inconsistencies will be resolved, although the Party did not provide details of the methods it plans to use. In addition, Ukraine ensured the ERT that it will provide, in its next annual submission, summary tables on the land-use areas under different land categories for each year of the reported period for the entire country and land- use changes matrices related to the reported period. The ERT welcomes these planned improvements, which are critical for reporting the LULUCF sector in accordance with the IPCC good practice guidance for LULUCF.

Response:

Ukraine has taken into account the ERT recommendation. The land use matrices based on total values of Land-Use Categories area (from statistics form 6-zem) are presented in NIR 2011 (see tab. П32.6,). Ukraine has prepared information presenting the areas of land use categories and their components that have been used in the carbon stock change estimations in the LULUCF sector for the years 1990-2009 and will incorporate it in the next submission (see Table 1 of the Appendix). . These land use matrices have been used in the determination of the "conversion directions" of the land areas since the national statistics and forest land records do not reflect this information. Values from the land use transition matrices have been used to determine the land transitioning between all categories of land use, except those related to activities in the forestry sector. To determine the land transitioning between all categories of land use associated with activities in the forestry sector, the absolute values from geoinformation data base that is currently under development in Ukraine have been used. These values were proportionally allocated according to the area ratios obtained through the use of the land use matrices.

ARR Page 26, Paragraph 82

82. Among the categories of land converted to other land uses, only conversion to forest land was reported in the 2010 submission, while for all the remaining land uses the notation key "NE" was used. The Party explained in the CRF tables that the use of "NE" was due to a lack of AD or because of the assumption that land-use changes were realized by conversion to unmanaged areas. In response to a question raised by the ERT during the centralized review, Ukraine stated that management of lands included in each land use category constantly decreased (i.e. arable land decreased during the reporting period, therefore, it was assumed that the conversion results in a change to unmanaged land). The ERT notes that the land representation has to cover the total national territory; managed and unmanaged lands have to be accounted for in the LULUCF sector. Ukraine also clarified that land converted to forest land was deduced using data from a special programme conducted by the Ukrainian Government ("Forests of Ukraine 2010–2015"), which is still ongoing. The ERT recommends that Ukraine provide, in its next annual submission, a detailed explanation on the assumptions and approaches used to detect land converted to forest land. Furthermore, the ERT strongly recommends that Ukraine include in its reporting all mandatory land-use conversions in its next annual submission.

Response:

Ukraine has taken into account the ERT recommendation. The process of the development of the land-use matrices using the values of total areas of land-use categories from statistics form 6-zem is described in detail in chapter П3.2.1 of the NIR2011. Statistic data according area and directions of land-use transitions are not exist in Ukraine, so the land use matrices approach was used for determination land area converted between land-use categories. The land-use matrices are presented for each year of the time series. Regarding the Land converted from and to Forest Land, the process of area establishment is described both in NIR and in the response to paragraph 81. Also, chapter П3.2.1 of NIR present the areas of Land converted to and from Forest (the same values as afforestation and deforestation) for all time series (tables П3.2.7, П3.2.8).

ARR Page 27, Paragraph 83

83. Ukraine reported in the NIR national definitions for land-use categories and their relationship to the IPCC categories definitions. The ERT noted that Ukraine classified temporary fallow (class 10 of tables П3.2.1 of the NIR) in the grassland category, which is different from the definitions applied to the grassland and cropland categories in the IPCC good practice guidance for LULUCF. In response to a question raised by the ERT during the centralized review, Ukraine stated that fallow lands are reported, in national statistics, as annual and perennial grasses. The ERT recommends that, in its next annual submission, Ukraine classify temporary

fallow under the cropland category in accordance with the IPCC good practice guidance for LULUCF.

Response:

In the в NIR2011 all temporary fallow land was considered part of proper Land-Use category (see part П3.2.1):

- temporary fallow cropland land was considered part of Cropland that changed land-use intensity;
- temporary fallow grassland was considered part of Grassland that changed land-use intensity.

This view is in line with IPCC 2003 Methodology, tab.3.3.4 and 3.4.5., where the different values of coefficients (FLU, FMG, Fi) reflect different degrees of intensity of soil management. The same principle was used in national methodology, i.e. the amount of organic residue used in soils depends on land-use intensity. In table 3.3.4, IPCC 2003 default values for FLU are given for set aside lands with the description "Represents temporary set aside of annually cropland (e.g. conservation reserves) or other idle cropland that has been revegetated with perennial grasses". Under this type of management practice the land-use categories "annual grasses" and "perennial grasses" are assigned (see table П3.2.4 and П3.2.5, NIR2010). In order to increase clarity on the association of national and IPCC, 2003 definitions of Land-Use categories, a new column has been added in table П3.2.2 "Description of Land-Use category by IPCC, 2003" of NIR2011.

ARR Page 27, Paragraph 84

84. The ERT noted that direct N_2O emissions from N fertilization of forest land are reported as "NE", following the assumption that N_2O emissions from N fertilization of forest land were negligible. The ERT recommends that Ukraine estimate and report N_2O emissions from N fertilization of forest land if AD related to this activity are available. CO_2 emissions from the application of limestone on grassland have been reported also as "NE", and the Party explained in the CRF tables that the data for the application of limestone on grassland are not available. In the previous review report it was recommended that Ukraine estimate and report all mandatory categories reported as "NE" in its next annual submission. The ERT reiterates this recommendation.

Response:

Following the ERT recommendations, inquiries were made last year to all pertinent agencies to ascertain that no lime application nor N fertilization has taken place in Ukraine. The replies to the questionnaires received (which are available for inspection), affirm that lime utilization in grasslands and N fertilization in forests have not taken place in Ukraine.

ARR Page 27, Paragraph 85

85. Ukraine reported an uncertainty assessment for all land use categories, following the tier 1 approach, on the basis of expert judgement. In response to a question raised by the ERT during the centralized review, Ukraine stated that calculations were carried out following the methodology described in the IPCC good practice guidance for LULUCF. The ERT recommends that Ukraine provide, in its next annual submission, additional information on the method and assumptions used in the uncertainty assessment, to clarify how values, especially those based on expert judgement, are selected, considering that the reported values are considerably lower than the uncertainty default values.

Response:

In NIR2011 Ukraine revised the uncertainty calculation. This resulted in new uncertainty values for each land-use category: for Cropland the total level of uncertainty from 34% (NIR2010), increased to 76% (NIR2011); for Grassland from40% (2010) to 70% (2011); for Wetlands from 74% (2010) to 58% (2011); for Settlements from 7% (2010) to 16% (2011); for Others from 14% (2010) to 17% (2011). Additional information on the methods and assumptions used in this uncertainty assessment is available if required and will be provided in the next inventory submission.

ARR Page 27, Paragraph 86

86. The ERT noted discrepancies between that forest land areas reported in the NIR (table П3.2.20) and those reported in the CRF tables; for example, in the CRF tables a forest land area of 10,025 kha in 1990 was reported, while in the NIR the area was reported to be 10,195 kha; similarly, in 2000, 9,969 kha was reported under the forest land category in the CRF tables, while 10,413 kha was reported in the NIR; and finally, in the CRF tables a forest land area of 9,960 kha was reported for 2008 compared with the 10,570 kha reported in NIR. In response to a question regarding this issue raised by the ERT during the centralized review, Ukraine stated that these discrepancies, which were due to a mistake in table П3.2.20, will be corrected in its next annual submission The ERT strongly recommends that Ukraine verify the effectiveness of the land uses assessment used by the Party, at regional and national level, assuring consistency between different data sources and coherence of the reported data in its next annual submission.

Response:

In the 2011 GHG inventory preparation, the newly instituted GIS-database which records the activities in Ukrainian forests has been used. According to this GIS-database, Ukraine's area of Managed Forest varies over time between 8.9 and 9.0 million ha. The same values have been used for "5A.1 Forest Land Remaining Forest Land/Managed Forest" (LULUCF) and for the category "3.4 Forest Management (KP-LULUCF). Table 1 of the Appendix (in the context of land-use categories) and 2011 NIR tables П3.2.23 (in the context of Ukrainian administrative regions), 11.3.2 (in the context of 3.4 activities) present these values.

ARR Page 28. Paragraph 87.

87. Ukraine estimated carbon stock changes from forest land remaining forest land using national statistical data and country-specific parameters. The country-specific data on biomass increment and root-to-shoot ratio are reported for major forest types and natural zones. The ERT noted that the NIR does not report details on the used methodology to estimate carbon stock changes, or on biomass expansion factors and ratio; therefore, during the centralized review, the ERT asked Ukraine to clarify whether the carbon stock changes assessment for biomass was done at the national level or, if otherwise, it results from the sum of district level assessments, detailing also how the administrative districts (reported in table П3.2.20) are grouped into the different ecological zones reported in table П3.2.21). In response to this question, Ukraine provided a table showing distribution of administrative districts by the different natural zones. The ERT recommends that Ukraine include this table in the NIR of its next annual submission. Nevertheless, the ERT notes that the information provided is not sufficient to allow an evaluation of the carbon stock changes estimates and strongly reiterates the recommendation from the previous review report that Ukraine further verify its set of biomass expansion factors and ratios and recommends that Ukraine provide, in its next annual submission, information on the emissions/removals estimation process (use of growth equations, model approaches or other) in order to improve transparency.

Response:

The process of carbon stock change calculation in living biomass (aboveground and underground) has been described in chapter П3.2.2. The national factors for both pools of living biomass are presented in Table 2 of the Appendix. National coefficients of average annual growth of above-ground vegetation have been used in the estimations of carbon stock changes. This information was included in each of the previous NIR and in the NIR2010 (see chapter П3.2. 21).

During the centralized review Ukraine explained its approach to estimation of underground biomass, more detailed data on this, including coefficients, is presented in Table 3 of the Appendix. This information has also been used for grouping of Ukrainian administrative regions in the context of climatic zones of Ukraine. Ukraine appreciated the recommendations of the ERT and will further work on improving the description of the methods used in the next submission.

We suggest to change last sentence in ERT comment from "Nevertheless, the ERT notes that the information provided is not sufficient to allow an evaluation of the carbon stock changes estimates and strongly reiterates the recommendation from the previous review report that Ukraine further verify its set of biomass expansion factors and ratios and recommends that Ukraine provide, in its next annual submission, information on the emissions/removals estimation process (use of growth equations, model approaches or other) in order to improve transparency."

to

"The ERT notes that the information provided is not sufficient to allow an evaluation of the carbon stock changes estimates and strongly reiterates the recommendation from the previous review report that Ukraine further verify its set of biomass expansion factors and ratios and recommends that Ukraine provide, in its next annual submission, information on the values of coefficients which are used for calculations in order to improve transparency."

ARR Page 28, Paragraph 88

88. Ukraine used a country-specific approach, based on the balance of N fluxes, to estimate emissions and removals from soils. The ERT noted an increasing trend in the total emissions in cropland remaining cropland, not taking into account liming: in 1990 the category was reported as a removal of 14,668.07 Gg CO_2, while an emission of 36,240.18 Gg CO_2, was reported for 2008 (essentially related to the increase of emissions in the soil pool: soil removals were equal to 11,349.37 Gg CO_2 in 1990, while in 2008 the emissions from soils were equal to 41,848.90 Gg CO_2), resulting in a decrease in total removals of 347.1 per cent. In the NIR, Ukraine explained that this significant change was a consequence of the variation of several factors, such as the volume of harvested crops, the amount of added organic residues and fertilizers and the dynamics of garden planting. The ERT notes that this change is mainly occurring in mineral soils. The ERT also notes that, in the period 1990–2008, the Party reported a decrease of 2.1 per cent in cropland area. The previous review report recommended that Ukraine verify its estimates (preferably by comparing the current method with the tier 2 approach in the IPCC good practice guidance for LULUCF) in order to increase transparency. The ERT notes that the recommendation has not been implemented and, during the centralized review, asked Ukraine to provide additional information so that it could better understand the methodology used in the estimates, focusing on the relation C:N used. In response to the question from the ERT during the centralized review, Ukraine informed the ERT that it used a country-specific approach to estimate emissions and removals from cropland soils, based on the N fluxes balance, an approach that is different from the methods proposed in the IPCC good practice guidance for LULUCF. Ukraine stated that the applied methodology utilizes the same approach and parameters used in the estimation of N_2O from soils in the agriculture sector, and it is connected with the calculation of N_2O emission from soil for land converted to cropland. The ERT considers that the information provided does not properly address the issue raised and strongly recommends that Ukraine provide, in its next annual submission, additional information explaining the emissions/removals trend of cropland soils and the methodology used in the estimates, focussing on the relation C:N used, reiterating the recommendation from the previous review report that the Party compare the current method with the tier 2 approach in the IPCC good practice guidance for LULUCF, in order to increase transparency.

Response:

The national approach used is related to the methodology for the assessment of N_2O emission from soils in Agriculture Sector. In both sectors, the same activity data are used. In the Agriculture Sector emissions of N_2O are obtained from the inputs of plant residuals in soils. In the LULUCF Sector, category "Cropland" this process is taken to include wider considerations (bearing in mind issues double counting), covering the plant residuals in soils, their decomposition as well ashumification process. The methodology is based on the inverse relation between the quantity of organic material input into arable soils and value of humus mineralization in it. NIR 2010 presented the initial results of a comparison between the two methodologies, the i.e the national methodology and the tier 2 approach of IPCC while NIR2011 gave further details (see tab. П3.2.9). The level of correlation between the two methods is estimated to be 0,9 (see chapter 7.3.4 in NIR2010 and chapter П3.2 in NIR2011).

ARR Page 29, Paragraph 89

89. Ukraine used a country-specific approach, based on the balance of N fluxes, to estimate emissions and removals from soils, similar to the approach used for the cropland remaining cropland category. The ERT noted a significant difference (300.6 per cent of decrease) in the estimate of CO_2 emissions and removals from the grassland remaining grassland category in 2007, between the 2009 and 2010 submissions. In response to a question on this issue raised by the ERT during the centralized review, Ukraine clarified that the main reason for the recalculation was the availability of updated AD for grassland remaining grassland area, and the revision of the time series of organic soils area. The ERT considers that the information reported in NIR and the additional information provided during the centralized review does

not properly address the raised issue and strongly recommends that Ukraine provide detailed explanations on the recalculations in its next annual submission.

Response:

In the previous submission (see NIR2010) the reason of recalculation was described in detail and is mainly due to the availability of new AD that allowed the separation of managed grasslands from unmanaged.

ARR Page 29, Paragraph 90

90. Ukraine reported carbon stock changes in living biomass and in dead organic matter (not mandatory) as "NE" for the period 1990–2008, explaining that data on perennial trees do not exist in Ukraine. The ERT recommends that Ukraine use the notation key "NO" instead of "NE".

Response:

Ukraine has taken into account the ERT recommendation (see CRF tables for 2011 submission).

ARR Page 31, Paragraph 102

102. In its response to the draft annual review report Ukraine notified the secretariat of its intention to [accept][reject] the calculated adjustments[and sent a notification to the ERT with its rationale for not accepting the adjustments].

Response:

Ukraine accepts the calculated adjustment.

ARR Page 40, Paragraph 129

129. During the centralized review, the ERT noted that in Ukraine's reporting, land uses and land-use changes are not properly represented, resulting in overlapping areas of different categories and conversion categories, leading to double counting and consequently to a potential overestimation of removals by sinks and underestimation of emissions by sources. In the reporting, the sum of areas subject to Article 3, paragraphs 3 and 4, of the Kyoto Protocol is total forest land area; the area under forest management is quite different from the forest land remaining forest land area under the Convention (forest land remaining forest land area was reported as 9,960 kha, while the forest management area was reported to be 8,148 kha in CRF tables submitted on 25 May 2010 and 10,098 kha in CRF tables submitted on 17 October 2010); and the total country area reported in table NIR-2 amounts to 60,355 kha, while a different value (59,617 kha) can be deduced by the reporting of the different land uses under the Convention reporting. In particular, according to the ERT, Ukraine has not ensured a consistent land representation, has not ensured that areas of land subject to activities under Article 3, paragraphs 3 and 4, are identifiable, adequately reported and tracked during the commitment period in accordance with paragraph 6 of the annex to decision 15/CMP.1. The ERT further noted that the national system under Article 5, paragraph 1, of the Kyoto Protocol, shall ensure that areas of land subject to LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol are identifiable, and information about these areas should be provided by each Annex I Party in their national inventories in accordance with Article 7 (see para. 20 of annex to decision 16/CMP.1). Taking into account the issues identified above, the ERT considered that Ukraine did not meet the mandatory requirements regarding the national system for Article 3, paragraphs 3 and 4, of the Kyoto Protocol in its 2010 submission, or the mandatory reporting requirements included in decision 15/CMP.1 indicated above. Therefore, during the centralized review, the ERT recommended that Ukraine provide the necessary information in accordance with the requirements of paragraph 20 of decision 16/CMP.1.

Response:

The results presented to date in NIR submissions should be considered preliminary. Ukraine, being aware of the need for improvement of its inventory, has instituted a new facility based on GIS to inventory its forest areas to address the needs of reporting under articles 3.3 and 3.4 KP. This new facility and database has been designed to meet all the technical specifications and methodological requirements for LULUCF activities under KP.. The work is close to completion. The final results based on this facility are expected to be available in August 2011 and will be

utilized fully in the compilation of the next NIR. The process of developing the GIS-database is ongoing for the past several years as it requires the gathering of information from records stored in the archives at regional level. The information collected covers anthropogenic activities data (for 3.3-3.4, KP-LULUCF) from areas under the responsibility of the State Forest Resources Agency (tier 2, about 68% of all Ukrainian forest areas) and land under private forestry enterprises (tier 1, about 32% of all Ukrainian forest areas).. All information is classified by two indicators: administrative (by administrative Ukrainian regions) and nature-climatic (by climatic zones in Ukraine). The GIS database contains not only quantitative information (size of land area, the volume of biomass growth, amount of fires and logging after 2008 in areas of afforestation), but also qualitative (species-age characteristics of plantations). In addition, the GIS database contains records of such characteristics as the anthropogenic component (details of the documents governing the initiation of work and/or ending in the form of design documents, plans, acts of acceptance of work, etc.), information about the natural zone in which each plot is located, as well as information about ownership/management by legal entities. Cartographic software is developed starting with maps of administrative division of Ukraine, and maps of forest enterprises with fractional division to the level of individual sites (in the case of the State Forest Resources Agency). The work of digitization of cartographic material for earlier years for some areas is at the final stage. This is due to the large volume of mapping arrays because of the early years of the scheme areas were created primarily in hard copy or exist in electronic form which is incompatible with the computer software tool that was used to create GIS base.

The same values of activity data from the GIS database were used during GHG calculations for both UNFCCC and KP-LULUCF (3.3-3.4) reporting. Therefore, the results of calculations for "Forest Land Remaining Forest Land" (UNFCCC) and "Forest Management" (KP-LULUCF) are now the same. Same applies to categories "Land converted to Forest Land" and "Afforestation". Detailed descriptions of the GIS database and cartographic evidences for the identification of units of land under 3.3-3.4 activities are presented in NIR 2011, chapter 11.

We suggest to change last sentence in ERT comment from "Taking into account the issues identified above, the ERT considered that Ukraine did not meet the mandatory requirements regarding the national system for Article 3, paragraphs 3 and 4, of the Kyoto Protocol in its 2010 submission, or the mandatory reporting requirements included in decision 15/CMP.1 indicated above. Therefore, during the centralized review, the ERT recommended that Ukraine provide the necessary information in accordance with the requirements of paragraph 20 of decision 16/CMP.1."

To

"Taking into account the issues identified above, the progress that was achieved and later demonstrated to ERT during the review of the 5th National Communication, and the last responses by Ukraine and information in NIR, 2011, the ERT considered that Ukraine at this moment has a process in place that aims to meet the mandatory requirements regarding the national system for Article 3, paragraphs 3 and 4, of the Kyoto Protocol in its 2010 submission, or the mandatory reporting requirements included in decision 15/CMP.1 indicated above. Therefore, the ERT recommends that Ukraine provide the necessary information in the next submissions in accordance with the requirements of paragraph 20 of decision 16/CMP.1."

ARR Page 41, Paragraph 131

131. After assessing the information provided by Ukraine after the centralized review, in the ERT's view, Ukraine still does not meet the mandatory reporting requirements for Article 3, paragraphs 3 and 4, of the Kyoto Protocol as indicated in paragraph 127 above. In particular, the ERT notes that the national system is not able to ensure a consistent land representation, or to ensure that areas of land subject to LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol are identifiable in accordance with paragraph 20 of annex to decision 16/CMP.1. The ERT considers this problem as unresolved.

Response:

See response in paragraph 129.

We suggest adding a further sentence in ERT comment:

"Taking into account the issues identified above, the progress that was achieved and later demonstrated to ERT during the review of the 5th National Communication, and the last responses by Ukraine and information in NIR, 2011, the ERT considered that Ukraine at this moment has a

process in place that aims to meet the mandatory requirements regarding the national system for Article 3, paragraphs 3 and 4, of the Kyoto Protocol in its 2010 submission, or the mandatory reporting requirements included in decision 15/CMP.1 indicated above. Therefore, the ERT recommends that Ukraine provide the necessary information in the next submissions in accordance with the requirements of paragraph 20 of decision 16/CMP.1."

ARR Page 42, Paragraph 132

132. The ERT noted that in its 2010 submission Ukraine has not accounted for all carbon stock changes in the following mandatory carbon pools: dead wood (for the units of land subject to afforestation, reforestation and deforestation activities); and litter, dead wood and soil (for the units of land subject to forest management activities). The ERT noted that a Party may choose not to account for a given pool in a commitment period if transparent and verifiable information is provided that the pool is not a net source (para. 21 of the annex to decision 16/CMP.1). The ERT also noted that Ukraine did not provide transparent and verifiable information demonstrating that these unaccounted pools were not net sources of emissions. Therefore Ukraine did not meet the mandatory reporting requirements stated in decisions 15/CMP.1 and 16/CMP.1. During the centralized review, the ERT recommended that Ukraine provide the necessary information in accordance with the requirements of decisions 15/CMP.1 and 16/CMP.1.

Response:

The carbon stock change for carbon pools:

1) dead wood (for the units of land subject to afforestation, reforestation and deforestation activities); and

2) litter, dead wood (for the units of land subject to forest management activities)

has been estimated and reported in the 2011 inventory submission. The coefficients are shown in NIR 1990-2009: see tab. П3.2.28 for land converted to forest (the same values were used for forest land converted to another land-use category) and see tab. П3.2.29 for forest land remaining forest land. Both of the tables include information for litter and dead wood. In NIR2011, chapter 11.3.1.2, evidence that the soil carbon pool in units of lands under 3.4 activity Forest management is not a source of emissions is provided based on the results of research conducted in preparing this response.

We suggest adding a further sentence in ERT comment:

"Taking into account the issues identified above, the progress that was achieved and later demonstrated to ERT during the review of the 5th National Communication, and the last responses by Ukraine and information in NIR, 2011, the ERT considered that Ukraine at this moment has a process in place that aims to meet the mandatory reporting requirements included in decision 15/CMP.1 indicated above. Therefore, the ERT recommends that Ukraine provide the necessary information in the next submissions in accordance with the requirements of paragraph 20 of decision 16/CMP.1."

ARR Page 42, Paragraph 133

133. After the centralized review, in its response to the list of potential problems and further questions formulated by the ERT, Ukraine provided a document containing an expert opinion relating to the carbon stocks in the dead wood, litter and soil pools in forest. In particular, Ukraine referred to a study[8] on the dynamics of carbon stocks in plantations. In the ERT's view, this study and the graph reported on "Dynamics of carbon stocks in modal pine plantations on left-bank of wooded steppe regions in Ukraine" do not demonstrate that the dead wood, litter and soil pools are not net sources of emissions for the Ukrainian national territory, as carbon stocks are correlated to different management practices and climatic conditions and a single study (on plantations) cannot be representative of the national territory. Furthermore, this study does not consider the effects of harvesting at the end of a production cycle and during the following years with low biomass on that land. In the ERT's view, the response provided by Ukraine does not address the potential problem, because the additional information provided was not sufficient to demonstrate that the pools indicated above were not net sources of emissions; therefore the ERT considers this problem to be unresolved. As indicated in the statement made by Ukraine in its response to the list of potential problems and further questions, the ERT considers that a forest monitoring system, with continuous observations, should be implemented to supply the supporting information required by the rules of reporting for KP-LULUCF activities.

Response:

See response in paragraph 132.

We suggest to change last sentence in ERT comment from "In the ERT`s view, the response provided by Ukraine does not address the potential problem, because the additional information provided was not sufficient to demonstrate that the pools indicated above were not net sources of emissions; therefore the ERT considers this problem to be unresolved. As indicated in the statement made by Ukraine in its response to the list of potential problems and further questions, the ERT considers that a forest monitoring system, with continuous observations, should be implemented to supply the supporting information required by the rules of reporting for KP-LULUCF activities."

to

"In the ERT`s view, the response provided by Ukraine did not address the potential problem, because the additional information provided was not sufficient to demonstrate that the pools indicated above were not net sources of emissions. However taking into account the issues identified above, the progress which was achieved and later demonstrated to ERT during review of 5-th National Communication and last responses by Ukraine and information in NIR, 2011, the ERT at this moment considers that Ukraine has initiated action to resolve this problem . Toward this goal the ERT considers that a forest monitoring system, with continuous observations, should be implemented as soon as possible to supply the supporting information required by the rules of reporting for KP-LULUCF activities."

ARR Page 42, Paragraph 134

134. The ERT noted that, the inclusion of a land under Article 3, paragraph 3, of the Kyoto Protocol (and the related emissions by sources and removals by sinks occurring on that land) is specifically guided by the presence of a direct human-induced activity (para. 2 of annex to decision 16/CMP.1). Consequently, carbon stock changes and non-CO_2 emissions reported under afforestation and reforestation shall result from direct human- induced land-use change activities (Article 3, paragraph 3 of the Kyoto Protocol). Ukraine provided information on its forest definition and forest management rules in its 2010 annual submission and in responses the Party provided to the ERT during the centralized review. However, the ERT considered that the information provided did not demonstrate that activities of planting, seeding and/or human-induced promotion of natural seed sources have been carried out in the units of land in conversion to forest (para. 1(b) and 1(c) of the annex to decision 16/CMP.1). The ERT considered that this may lead to an overestimation of removals by sinks in the areas under afforestation and reforestation activities and recommended that Ukraine provide documentation demonstrating that all the afforestation and reforestation activities included in the identified units of land under these activities are directly human induced.

Response:

See response in paragraph 129.

We suggest that the last sentence of the ERT comment is modified as follows:
"The ERT considered that this may lead to an overestimation of removals by sinks in the areas under afforestation and reforestation activities and recommended that Ukraine speed up its efforts to provide documentation demonstrating that all the afforestation and reforestation activities included in the identified units of land under these activities are directly human induced"

ARR Page 43. Paragraph 135.

135. After the centralized review, in its response to the list of potential problems and further questions formulated by the ERT, Ukraine informed the ERT that it has started a special investigation for elaborating a database with cartographic components which will include information on evidence of the direct human component in these types of activities. Ukraine also indicated that afforestation activities in Ukraine are conducted according to: Instructions for designing, acceptance, recording and evaluating the quality of the cultivated sites (approved by the Ministry of Forestry of Ukraine on 8 July 1997, No. 62) and Rules of forest reproduction (approved by the Cabinet of Ministers of Ukraine on 1 March 2007, No. 303). Under these requirements, special documentation for projects of afforestation should be prepared for each case and for different periods of this activity, according to the requirements of the law. Ukraine also indicated that this documentation may be used for the demonstration of direct human-induced components. In the ERT's view, the response provided by Ukraine does not address the potential problem. In particular, no information has been supplied to demonstrate that all natural regeneration of forests is the consequence of direct human-induced activities or

that a decision was taken to allow trees to grow as a promotion of natural seed sources on each unit of land reported under afforestation and reforestation activities. Therefore the ERT considers this problem as unresolved. The ERT recommends that, in its next annual submission, Ukraine provide documentation demonstrating that all afforestation and reforestation activities included in the identified units of land under these activities are directly human induced.

Response:

See response in paragraph 129.

We suggest changing last sentence in ERT comment from: "Therefore the ERT considers this problem as unresolved. The ERT recommends that, in its next annual submission, Ukraine provide documentation demonstrating that all afforestation and reforestation activities included in the identified units of land under these activities are directly human induced."

to

"The ERT considered that this problem can be resolved through the use of the extended GIS-based forest inventory now in the process of full implementation and recommends that, , in its next submissions, Ukraine provide documentation demonstrating that all afforestation and reforestation activities included in the identified units of land under these activities are directly human induced."

ARR Page 43, Paragraph 136

136. Ukraine reported carbon stock changes in above-ground biomass, litter and soil pools, but the Party reported below-ground carbon stock changes as "IE" and did not provide estimates for the dead wood pool. In response to a question raised by ERT during the centralized review, Ukraine stated that below-ground carbon stock changes were included in above-ground carbon stock changes, while for the dead wood pool Ukraine plans to conduct special research to obtain transparent and verifiable information that this pool is not a net source of emissions. In the ERT's view, the response provided by Ukraine does not address these issues. The ERT strongly recommends that Ukraine provide transparent and detailed information supporting the fact that below-ground carbon stock changes are included in estimates of above-ground carbon stock changes and demonstrating that dead wood pool is not a net source of emissions in its next annual submission.

Response:

The coefficients for aboveground to total tree biomass (to incorporate belowground biomass) that have been used to estimate carbon stock changes were reported in NIR2010, table П3.2.26 (and in NIR2011, table П3.2.27) for each forest type. The calculation of carbon losses from the dead wood pool in lands under Afforestation was conducted during the last year, and the results are reported in the 2011 inventory submission.

We suggest changing ERT comment from: "Ukraine reported carbon stock changes in above-ground biomass, litter and soil pools, but the Party reported below-ground carbon stock changes as .IE. and did not provide estimates for the dead wood pool. In response to a question raised by ERT during the centralized review, Ukraine stated that below-ground carbon stock changes were included in above-ground carbon stock changes, while for the dead wood pool Ukraine plans to conduct special research to obtain transparent and verifiable information that this pool is not a net source of emissions. In the ERT's view, the response provided by Ukraine does not address these issues. The ERT strongly recommends that Ukraine provide transparent and detailed information supporting the fact that below-ground carbon stock changes are included in estimates of above-ground carbon stock changes and demonstrating that dead wood pool is not a net source of emissions in its next annual submission."

to

"Ukraine reported carbon stock changes in above-ground biomass, litter and soil pools, but the Party reported below-ground carbon stock changes as "IE" and did not provide estimates for the dead wood pool. In response to a question raised by ERT during the centralized review, Ukraine stated that below-ground carbon stock changes were included in above-ground carbon stock changes, while for the dead wood pool Ukraine plans to conduct special research to obtain transparent and verifiable information that this pool is not a net source of emissions. In the ERT's

view, the response provided by Ukraine does not fully address these issues. The ERT strongly recommends that Ukraine provide transparent and detailed information supporting the fact that below-ground carbon stock changes are included in estimates of above-ground carbon stock changes and demonstrating that dead wood pool is not a net source of emissions in its next annual submission.

ARR Page 43, Paragraph 137

137. Ukraine did not report GHG emissions from biomass burning. During the centralized review, Ukraine clarified that data on burned areas are available only for land covered by forest, without distinction between area under afforestation/reforestation or forest management activities. Ukraine also acknowledged the need to conduct special research to obtain data on fire events on afforested or reforested areas. The ERT strongly recommends that Ukraine report CO_2 and non-CO_2 emissions from biomass burning in its next annual submission.

See also response in paragraph 129.

ARR Page 43. Paragraph 138.

138. In its 2010 submission, Ukraine did not provide information on emissions and removals of GHG from lands harvested during the first commitment period following afforestation and reforestation on these units of land since 1990. Therefore, the ERT considered that Ukraine did not meet the mandatory reporting requirements stated in paragraph 8(c) of the annex to decision 15/CMP.1 and recommended that the Party provide this required information. After the centralized review, in its response to the list of potential problems and further questions formulated by the ERT, Ukraine provided the required information in the revised CRF tables and informed the ERT that it has started a special investigation for elaborating a database with cartographic components which will include data on lands harvested during the first commitment period following afforestation and reforestation on units of land since 1990. The ERT considered that this issue has been adequately addressed by Ukraine in its response and recommends that Ukraine report this explanation and background information in its next annual submission.

Response:

See also response in paragraph 129.

ARR Page 44, Paragraph 139

139. Ukraine reported carbon stock changes in above-ground biomass, litter and soil pools, but the Party reported below-ground carbon stock changes as "IE" and did not provide estimates for the dead wood pool. In response to a question raised by ERT during the centralized review, Ukraine stated that below-ground carbon stock changes were included in above-ground carbon stock changes while for the dead wood pool Ukraine plans to conduct special research to obtain transparent and verifiable information that this pool is not a source. In the ERT's view, the response provided by Ukraine does not address these issues. The ERT strongly recommends that Ukraine provide transparent and detailed information supporting the fact that below-ground carbon stock changes are included in estimates of above-ground carbon stock changes and demonstrating that dead wood pool is not a net source of emissions in its next annual submission.

Response:

Belowground carbon stock changes were included in above-ground carbon stock changes. The coefficients for aboveground to total tree biomass (to incorporate belowground biomass) that have been used to estimate carbon stock changes were reported in NIR2010, table П3.2.26 for each forest type. The calculation of carbon losses from the dead wood pool in lands under Deforestation was conducted during the last year, and the results are reported in the 2011 inventory submission.

We suggest changing last sentence in ERT comment as follows "In the ERT's view, the response provided by Ukraine does not address fully these issues. The ERT strongly recommends that Ukraine completes the work already initiated so as to provide transparent and detailed information supporting the fact that below-ground carbon stock changes are included in estimates of above-ground carbon stock changes and demonstrating that dead wood pool is not a net source of emissions in its next annual submission."

ARR Page 44, Paragraph 140

140. Ukraine reported carbon stock changes only for above-ground biomass, and did not report below-ground carbon stock changes. Ukraine did not provide estimates for carbon stock changes in the dead wood, litter and soil pools. After the centralized review, in its response to the list of potential problems and further questions formulated by the ERT, Ukraine provided a document containing an expert opinion relating to the carbon stocks in the dead wood, litter and soils pools in forests. In the ERT's view, the response provided by Ukraine does not address the potential problem, because the additional information provided was not sufficient to demonstrate that the pools indicated above were not net sources of emissions (see para. 133 above); therefore the ERT considers this problem to be unresolved.

Response:

Belowground carbon stock changes are included in above-ground carbon stock changes. The coefficients for aboveground to total tree biomass (to incorporate belowground biomass) that have been used to estimate carbon stock changes were reported in NIR2010, table П3.2.26 for each forest type.

About the ERT comment on carbon stock changes in the rest of forest carbon pools – see the reply to paragraph 132 above.

We suggest changing the last sentence in ERT comment from: "In the ERT's view, the response provided by Ukraine does not address the potential problem, because the additional information provided was not sufficient to demonstrate that the pools indicated above were not net sources of emissions (see para. 133 above); therefore the ERT considers this problem to be unresolved"

to

"In the ERT's view, the response provided by Ukraine does not address adequately the potential problem, because the additional information provided was not sufficient to demonstrate that the pools indicated above were not net sources of emissions (see para. 133 above); therefore the ERT recommends that Ukraine enhances the expert opinion submitted with additional information that clearly demonstrates that that the pools indicated above were not net sources of emissions."

ARR Page 52, Paragraph 166

166. From the information contained in the NIR, CRF tables and the additional information received during and after the centralized review the ERT concludes that the Ukrainian national system does not fully comply with the guidelines for national systems under Article 5, paragraph 1 of the Kyoto Protocol (decision 19/CMP.1) and the guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol (decision 15/CMP.1). The ERT concludes that some general and specific functions of the national system did not ensure that the 2010 annual submission of Ukraine was sufficiently transparent, consistent, comparable, complete and accurate, as required by the guidelines mentioned above, the UNFCCC reporting guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF. In particular, the ERT concludes that the following general and specific functions required for national systems did not operate fully in accordance with requirements set out in the annex to decision 19/CMP.1: ensure sufficient capacity for data collection for estimating anthropogenic GHG emissions by sources and removals by sinks (para. 10(b)); prepare national annual inventories and supplementary information in a timely manner in accordance with Article 5 and Article 7, paragraphs 1 and 2, and relevant decisions of the COP and/or Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (COP/MOP) (para. 10(d)); prepare estimates in accordance with the methods described in the Revised 1996 IPCC Guidelines, as elaborated by the IPCC good practice guidance and the IPCC good practice guidance for LULUCF, and ensure that appropriate methods are used to estimate emissions from key categories (para. 14(b)); collect sufficient AD, process information and EFs as are necessary to support the methods selected for estimating anthropogenic GHG emissions by sources and removals by sinks (para. 14(c)); provide ERTs 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 (para. 16(b)); and respond to requests for clarifying inventory information resulting from the different stages of the review process of the inventory information in accordance with Article 8 (para. 16(c)).

Response:

Ukraine recognizes that some areas of its national GHG inventory need further improvement in order to ensure that the whole inventory complies better with the principles of transparency, consistency, comparability, completeness and accuracy. Ukraine appreciates the recommendations by the ERT and notes that due to well known circumstances (explained to the ERT during the review process) it was not able to make some necessary improvements at an earlier stage. At the same time, Ukraine has made significant progress, which is recognized in the draft review report. In relation to this comment being listed as a question of implementation, Ukraine is unclear what particular problems with general and specific functions would constitute questions of implementation. Specific responses to the functions listed in the draft review report can be found below.

In Paragraph 166 of ARR2010 ERT noted: "In particular, the ERT concludes that the following general and specific functions required for national systems did not operate fully in accordance with requirements set out in the annex to decision 19/CMP.1: ensure sufficient capacity for data collection for estimating anthropogenic GHG emissions by sources and removals by sinks (para. 10(b));"

Ukraine is unclear of the context of this particular comment. The national system of Ukraine comprises experts in all sectors of the GHG inventory who have the knowledge, capacity and capability to collect data for estimating anthropogenic GHG emissions by sources and removals by sinks. At the same time, Ukraine recognizes that there are areas of the GHG inventory that pose particular challenges associated with obtaining the appropriate activity data to estimate emissions and removals. However, these challenges are linked to the structure and scope of the national statistical system and not to the capacity of the NS to collect data for the GHG inventory process. In response to comments from the present and past review processes, Ukraine has already added missing emissions estimates in its 2011 GHG inventory submission and is in the process of prioritizing the remaining gaps in the GHG inventory to ensure that future GHG submissions are more complete. In light of the above, Ukraine requests the deletion of this part of paragraph 166.

In Paragraph 166 of ARR2010 ERT noted: "prepare national annual inventories and supplementary information in a timely manner in accordance with Article 5 and Article 7, paragraphs 1 and 2, and relevant decisions of the COP and/or Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (COP/MOP) (para. 10(d));".

As stated in paragraph 6 of the draft review report, Ukraine submitted its original NIR and CRF on 12 April 2010 and on 13 April 2010, respectively. These dates are before the conventional submission date of 15 April 2010. Ukraine recognises that in some instances the information in the original submissions was not complete and, subsequently, provided revised GHG inventory data and additional information. Additional information was also provided in response to comments by the ERT. Ukraine has made significant progress in meeting its reporting requirements and is now in a position to routinely report its NIR and CRF by 15 April each year (demonstrated by submitting its 2011 GHG inventory on 15 April 2011). The comment in this part of paragraph 166 seems to indicate that Ukraine's 2010 GHG inventory was not submitted in a timely manner, which (although being in need of supplementing it with additional data) clearly is not the case. In light of the above, Ukraine requests the deletion of this part of paragraph 166.

In Paragraph 166 of ARR2010 ERT noted: "prepare estimates in accordance with the methods described in the Revised 1996 IPCC Guidelines, as elaborated by the IPCC good practice guidance and the IPCC good practice guidance for LULUCF, and ensure that appropriate methods are used to estimate emissions from key categories (para. 14(b));"

In accordance with paragraph 155 of the draft review report, the ERT recognizes that the "inventory is generally in line with the UNFCCC reporting guidelines, the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF. Many key categories are estimated using higher tier and country-specific methodologies, in accordance with the IPCC good practice guidance, and completeness of the inventory increased in the 2010 submission. The ERT commends Ukraine for the efforts made." The paragraph continues to list some areas in which the GHG inventory requires further improvements. Ukraine has already implemented a number of the recommendations from the ERT and has included estimates in its 2011 inventory submission. Examples include:

- CO_2 emissions from oil production;

- CO_2 and CH_4 from oil venting;
- CO_2 and N_2O emissions from oil flaring;
- CO_2 and CH_4 from venting of natural gas;
- CO_2 emissions from natural gas transmission;
- emissions from the use of HFC-410a in the equipment for a stationary air-conditioning;
- use of HFC-134a in vehicle air conditioning;
- potential emissions from HFCs and PFCs in the categories of "Foam blowing", "Fire Extinguishers" and "Aerosols".

The efforts of Ukraine will increase to ensure that the methods used in all key categories comply with the requirements of the IPCC guidelines and the good practice guidance. After having read carefully the review report, it is not obvious which problems of specific activities would constitute questions of implementation. Ukraine would be grateful to hear from the ERT which are these activities in order to ensure that they receive the appropriate attention in the preparation of future national GHG inventories.

In Paragraph 166 of ARR2010 ERT noted: "collect sufficient AD, process information and EFs as are necessary to support the methods selected for estimating anthropogenic GHG emissions by sources and removals by sinks (para. 14(c));".

According to paragraph 10 of the draft review report, the ERT recognized that "The inventory covers most source and sink categories for the period 1990-2008 and is complete in terms of gases, years and geographical coverage." This part of the report continues to list areas that need to be completed. Ukraine appreciates the recommendations of the ERT, some of which have already been implemented as discussed in other parts of this response. The collection of AD and EFs is a process to which Ukraine pays particular attention. After having read carefully the review report, it is not obvious which problems with AD would constitute questions of implementation. Ukraine would be grateful to hear from the ERT which are these cases in order to ensure that they receive the appropriate attention in the preparation of future national GHG inventories.

In Paragraph 166 of ARR2010 ERT noted: "provide ERTs 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 (para. 16(b));"

During the centralized review, Ukraine made every effort to ensure that the ERT had access to all archived information used for the compilation of the national GHG inventory. In accordance with paragraph 30 of the draft review report, the ERT recognized that "During the centralized review, the ERT was provided with the requested additional archived information in due course (except confidential information)." Ukraine received a clarification from the Lead Reviewers of the ERT, according to which this particular comment in paragraph 166 only relates to the ERT not having access to confidential information for two activities in the Industrial Process sector (specifically: Dolomite Use and Production of Silicon Carbide; the latter of which is not a key source). Furthermore, paragraph 28 of the draft review report states that "After the centralized review, in its response to the ERT's list of potential problems and further questions, Ukraine agreed to provide the confidential information to the ERT. The ERT strongly recommends that Ukraine improve the transparency of the inventory in the industrial processes sector and provide the data in future reviews, at the request of the ERT." Ukraine regrets the miscommunication between the national experts and the ERT regarding access to the requested activity data. Based on paragraphs 28 and 30 and the clarification by the Lead Reviewers, Ukraine feels that the language in paragraph 166 is misleading as it could be misunderstood as referring to Ukraine not providing access to all archived information, which clearly is not the case. Ukraine accepts the strong recommendation by the ERT and is putting in place all necessary procedures (including additional training of our staff dealing with confidential data) to ensure that such a situation will not happen again in the future. In light of the above, Ukraine requests the deletion of this part of paragraph 166.

In Paragraph 166 of ARR2010 ERT noted: "and respond to requests for clarifying inventory information resulting from the different stages of the review process of the inventory information in accordance with Article 8 (para. 16(c))."

According to paragraph 9 of the draft review report, "Ukraine provided the ERT with additional information and documents which are not part of the annual submission but are in many cases referenced in the NIR. The full list of information and documents used during the review is provided in annex I to this report." There are various references in the draft review report stating that Ukraine either clarified issues or provided additional information to the ERT (for example paragraphs 12, 18, 21, 39, 50, 81, 82, 87, 89, 137, 145, 149). Ukraine does not recall any instances

where it did not respond to requests by the ERT for clarifications (excluding the misunderstanding leading to the ERT not having access to confidential data as explained above). Furthermore, Ukraine is examining its NIR to ensure that all of its sections contain clear and concise information as well as any additional clarifications necessary. In light of the above, Ukraine requests the deletion of this part of paragraph 166.

ARR Page 52, Paragraph 167

167. In this respect, the ERT notes that over the last few years Ukraine has not been able to collect the necessary AD, process information and EFs to estimate the relevant missing GHG emissions by sources and removals by sinks, as applicable. The ERT further notes that Ukraine has, in the past and current NIRs, consistently presented plans to estimate the missing GHG emissions, but these have not been implemented in its 2010 submission. The ERT also notes that in response to the list of potential problems and further questions formulated by the ERT, Ukraine stated that, as a result of economic crisis and limited public funds in the country, the investigations aimed to support the national system had not been funded and that part of the financial resources from the sale of AAUs is planned to be used for the support of the national GHG inventory.

Response:

The comments in this paragraph reflect the realities that the Ukrainian GHG inventory team has been facing over the last few years. Despite efforts made (including announcing specific research grants and programmes, but having to cancel them due to the withdrawal of funding support as a result of competing priorities within the country) there are still areas of the inventory that are reported as not estimated (NE). Ukraine is now in a position to concentrate on key priorities of the GHG inventory process. As demonstration, in the 2011 GHG submission, the number of areas reported as NE is smaller compared to previous submissions. Ukraine is determined to continue to improve its GHG inventory and this effort has the support of the Ukrainian government at the highest level. Information of further improvements will be made available in May 2011.

ARR Page 52, Paragraph 168

168. The ERT also concludes from the information contained in the NIR, CRF tables and the additional information received during and after the centralized review that the Ukrainian national system is not able to ensure that areas of land subject to LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol are identifiable in accordance with paragraph 20 of annex to decision 16/CMP.1.

Response:

Based on responses provided to paragraphs 129 and 131, Ukraine suggests to present paragraph 168 as follows:

"168. The ERT also concludes from the information contained in the NIR and the CRF tables as well as the additional information received during and after the centralized review that the Ukrainian national system has difficulties at its present state to ensure that the land subject to LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol are identifiable in accordance with paragraph 20 of annex to decision 16/CMP.1. Ukraine has submitted information on ongoing fundamental improvements to the system already under way, to be completed in August 2011, that would adequately address these difficulties, and reported them in part in its 2011 submission. The ERT considers it a necessary condition for meeting the requirements for identification of land subject to LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol that Ukraine endevour as a matter of priority to have in place this system on schedule and as planned."

ARR Page 52, Paragraph 169

169. In accordance with paragraphs 68 and 69 of the annex to decision 22/CMP.1, the ERT identified categories in the industrial processes sector for which emissions probably occur in Ukraine and for which methodologies to estimate emissions are available in the Revised 1996 IPCC Guidelines and the IPCC good practice guidance and recommended that Ukraine submit emission estimates or provide further justifications for not providing estimates for the identified categories for resolving the potential problems. In addition, the ERT identified a

category in the energy sector for which 2008 emissions have been underestimated. Following the review of the additional information provided by Ukraine after the centralized review, the ERT concluded that the Party did correct the problem for the category in the energy sector, but it did not correct the problem for the categories in the industrial processes sector and therefore the ERT decided to calculate and recommend four adjustments in accordance with the guidance for adjustments under Article 5, paragraph 2, of the Kyoto Protocol.

Response:

Ukraine accepts the adjustments proposed by the ERT. Furthermore, the 2011 submission incorporates GHG emission estimates from previously not reported categories such as HFCs from Refrigeration and Air Conditioning; and HFCs and PFCs from Foam blowing, Fire Extinguishers and Aerosols. Ukraine is continuing its efforts to collect AD and estimate emissions from other Industrial Process activities for future GHG submissions.

REFERENCED LULUCF TABLES

Table 1. Land use areas, thousand ha

Category of land use (the source of information is referenced in the parenthesis)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Forests (form 6-zem)	10221,5	10357,8	10413,6	10426,2	10438,9	10457,5	10475,9	10503,7	10539,9	10556,3	10570,1	10591,9
Forest land remaining forest land /3.4 Managed forests (GIS-database)	8899,8	8956,1	8986,9	8991,2	9019,3	9031,8	9031,7	9038,2	9033,5	9018,5	8982,3	8950,3
Unmanaged forests[6]	1312,1	1356,6	1351,5	1354,7	1332,5	1333,4	1344,5	1358,1	1378,4	1385,2	1406,9	1422,8
Land converted to forest land /3.3 Aforestation (land use matrix and GIS-database)[7]	9,6	45,1	75,2	80,3	87,1	92,3	99,7	107,4	128,0	152,6	180,9	218,8
Cropland (6-zem)	35847,3	35605,5	35147,9	35115,2	35083,6	35040,5	35017,7	34992,1	34954,7	34935,5	34926,8	34914,2
Managed cropland	34156,7	33865,8	33031,9	32977,4	32993,7	32896,0	32880,4	32827,7	32803,6	32777,3	32819,6	32774,1

[6] All categories of "unmanaged" land are determined as the difference between (A) the total area of land-use from statistical form 6-zem, (B) the land remaining permanently in a particular land-use category from statistical form 29-ch, and (C) land converted to that land-use category (from land-use transition matrix), i.e. as (A)-(B)-(C).

[7] Areas of land converted to the land use categories are determined on the basis of the transition matrix based on form 6-zem. However, with respect to forests, shares of different land-use categories in the total area of land converted to forests (afforestation) and forest land converted to other land use categories (deforestation) were taken into account based on the information from the GIS database. Balance of territories was achieved by adjusting the subcategories of unmanaged land within each land use category.

Category of land use (the source of information is referenced in the parenthesis)	**1990**	**1995**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
(harvested areas, form 29-cr)												
Unmanaged cropland	1690,6	1568,2	1944,1	1965,9	1917,9	1972,5	1964,6	1991,8	1978,5	1985,6	1934,6	1960,3
Land converted to cropland (transition matrix on the basis of form 6-zem)	0,04	171,50	171,90	171,95	171,95	172,05	172,65	172,66	172,66	172,66	172,66	179,75
Including forest land converted to cropland /3.3 Deforestation (transition matrix and GIS database)	0,04	4,80	5,20	5,25	5,25	5,35	5,95	5,96	5,96	5,96	5,96	13,05
Grassland (6-zem)	7232,1	7523,8	7909,9	7924,3	7938,7	7968,3	7968,1	7950,5	7938,8	7933,4	7918,0	7899,5
Managed grassland (harvested areas, form 29-cr)	2460,6	2092,2	2039,5	1896,9	1762,2	1776,0	1591,5	1714,5	1517,4	1500,2	1319,7	1707,9
Unmanaged grassland	4577,3	4927,0	4972,0	5114,5	5249,0	5235,2	5419,5	5278,9	5464,2	5475,7	5640,8	5234,1
Land converted to grassland (transition matrix)	194,2	504,6	898,4	912,9	927,5	957,1	957,1	957,1	957,2	957,5	957,5	957,5
Including forest land converted to grassland /3.3 Deforestation (transition matrix and GIS-database)	0,01	0,9	8,6	8,6	8,8	8,8	8,8	8,9	8,9	9,3	9,3	9,3

Category of land use (the source of information is referenced in the parenthesis)	**1990**	**1995**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Wetland (6-zem)	3319,1	3353,5	3370,7	3374,2	3372,8	3374	3378,2	3382,9	3391,1	3397,40	3400,50	3402,60
Managed wetland (6-zem)	32,1	29,6	11,7	10,0	8,6	9,6	9,0	8,9	8,1	8,1	8,1	7,9
Unmanaged wetland	3287,0	3289,4	3299,4	3301,1	3301,1	3300,1	3300,7	3300,8	3301,6	3296,8	3296,8	3297,0
Land converted to wetland (transition matrix)	0,0	34,5	59,6	63,1	63,1	64,3	68,5	73,2	81,4	92,5	95,6	97,7
Including land converted to wetland /3.3 Deforestation (transition matrix and GIS-database)	0,0	0,1	3,7	3,7	3,7	3,7	3,7	3,7	3,7	8,5	8,5	8,5
Settlements (6-zem)	2420,3	2312,7	2456,2	2449,4	2463	2459,3	2458,3	2467,5	2470,2	2476,6	2489,0	2499,1
Settlements remaining Settlements	2420,2	2207,9	2176,8	2170,0	2169,6	2165,9	2164,6	2164,5	2164,4	2160,8	2124,6	2101,6
Land converted to Settlements (transition matrix)	0,1	104,8	279,4	279,4	293,4	293,4	293,7	303,0	305,8	315,8	364,4	397,5
Including forest land converted to settlements /3.3 Deforestation (transition matrix and GIS-database)	0,1	9,8	39,7	39,7	40,1	40,1	40,4	40,5	40,6	44,2	80,4	103,4
Other land (6-zem)	1314,5	1201,5	1056,5	1065,5	1057,8	1055,2	1056,6	1058,1	1060,1	1055,6	1050,4	1047,5

Category of land use (the source of information is referenced in the parenthesis)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Other Land remaining Other Land	1214,3	1006,2	857,7	857,6	849,9	847,3	847,2	847,2	847,1	836,3	831,1	826,5
Land converted to other land (transition matrix on the basis of form 6-zem)	100,2	195,3	198,8	207,9	207,9	207,9	209,4	210,9	213,0	219,3	219,3	221,0
Including land converted to other land /3.3 Deforestation (transition matrix and GIS-database)	0,01	1,6	3,4	3,4	3,4	3,5	3,6	3,6	3,6	9,9	9,9	11,7
Total land converted from forest land to other land use categories /3.3 Deforestation (transition matrix and GIS-database)	0,1	17,1	60,5	60,7	61,3	61,5	62,5	62,6	62,8	77,9	114,0	146,0

Table 2. Biomass increase by natural areas and species for forest land remaining forest land (national data), t / ha / year

Natural zones and species	Aboveground biomass increase	Underground to aboveground biomass ratio	Aggregated coefficients used in calculations
Marshy woodlands (Polesie)			
Pine	3,60	0,16	4,18
Spruce	5,00	0,15	5,75
Other conifers	4,20	0,14	4,79
Oak	3,30	0,16	3,83
Other hardwood	3,10	0,14	3,53
Birch	3,40	0,12	3,81
Alder	3,50	0,12	3,92
Aspen	3,20	0,12	3,58
Other softwood	3,10	0,12	3,47
Other wood species	3,00	0,12	3,36
Forest-steppe			
Pine	3,40	0,16	3,94
Spruce	5,00	0,14	5,70
Other conifers	3,50	0,14	3,99
Oak	3,20	0,16	3,71
Beech	4,00	0,14	4,56
Other hardwood	3,80	0,15	4,37
Birch	3,30	0,12	3,70
Alder	3,40	0,12	3,81
Aspen	3,20	0,12	3,58
Other softwood	3,10	0,12	3,47
Other wood species	3,00	0,12	3,36
North Steppe			
Pine	2,60	0,17	3,04
Oak	3,00	0,17	3,51
Other hardwood	2,80	0,15	3,22
Birch	3,20	0,12	3,58
Alder	3,30	0,12	3,70
Aspen	3,10	0,12	3,47
Other softwood	3,00	0,12	3,36
Other wood species	3,00	0,12	3,36
South Steppe			
Pine	2,40	0,17	2,81
Oak	3,00	0,17	3,51
Other hardwood	2,80	0,15	3,22
Birch	3,10	0,12	3,47
Alder	3,20	0,12	3,58
Other softwood	2,80	0,12	3,14
Other wood species	2,80	0,12	3,14

Natural zones and species	Aboveground biomass increase	Underground to aboveground biomass ratio	Aggregated coefficients used in calculations
Carpathians			
Pine	3,40	0,15	3,91
Spruce	5,40	0,14	6,16
Other conifers	5,00	0,14	5,70
Oak	3,40	0,15	3,91
Beech	4,20	0,15	4,83
Other hardwood	4,00	0,14	4,56
Birch	3,40	0,12	3,81
Alder	3,50	0,12	3,92
Aspen	3,20	0,12	3,58
Other softwood	3,00	0,12	3,36
Other wood species	3,20	0,12	3,58
Crimea			
Pine	2,40	0,16	2,78
Other conifers	2,20	0,15	2,53
Oak	2,20	0,17	2,57
Beech	2,80	0,15	3,22
Other hardwood	2,50	0,14	2,85
Birch	3,10	0,12	3,47
Alder	3,20	0,12	3,58
Aspen	3,00	0,12	3,36
Other softwood	2,80	0,12	3,14
Other wood species	2,80	0,12	3,14
Shrubs (all zones)	0,4	1,25	0,50

Table 3. Biomass increase by natural areas and species for land converted to forest land (national data), t / ha / year

Natural zones and species	Aboveground biomass increase	Underground to aboveground biomass ration	Aggregated coefficients used in calculations
Marshy woodlands (Polesie)			
Pine	3,1	1,20	3,72
Spruce	4,8	1,30	6,24
Other conifers	3,4	1,20	4,08
Oak	2,5	1,25	3,13
Other hardwood	2,4	1,24	2,98
Birch	2,6	1,15	2,99
Alder	3,8	1,15	4,37
Aspen	4,2	1,15	4,83
Other softwood	4,0	1,15	4,60
Other wood species	3,4	1,15	3,91
Forest-steppe			
Pine	2,5	1,20	3,00
Spruce	4,4	1,30	5,72
Other conifers	3,4	1,20	4,08
Oak	2,6	1,25	3,25
Beech	1,6	1,22	1,95
Other hardwood	2,0	1,20	2,40
Birch	2,6	1,20	3,12
Alder	3,8	1,20	4,56
Aspen	4,2	1,20	5,04
Other softwood	4,0	1,20	1,80
Other wood species	3,4	1,20	3,00
North Steppe			
Pine	2,0	1,22	2,44
Oak	1,4	1,27	1,78
Other hardwood	1,5	1,25	1,88
Birch	2,5	1,21	3,03
Alder	3,6	1,21	4,36
Aspen	4,0	1,21	4,84
Other softwood	3,8	1,20	4,56
Other wood species	3,2	1,20	3,84
Southern Steppe			
Pine	1,6	1,22	1,95
Oak	1,2	1,28	1,54

Natural zones and species	Aboveground biomass increase	Underground to aboveground biomass ration	Aggregated coefficients used in calculations
Other hardwood	1,4	1,25	1,75
Birch	2,4	1,20	2,88
Alder	3,5	1,20	4,20
Other softwood	3,6	1,20	4,32
Other wood species	3,2	1,20	3,84
Carpathians			
Pine	2,4	1,20	2,88
Spruce	5,0	1,30	6,50
Other conifers	4,8	1,20	5,76
Oak	1,6	1,25	2,00
Beech	1,8	1,22	2,20
Other hardwood	1,5	1,20	1,80
Birch	2,6	1,20	3,12
Alder	3,8	1,20	4,56
Aspen	4,2	1,20	5,04
Other softwood	4,0	1,20	4,80
Other wood species	3,4	1,20	4,08
Crimea			
Pine	1,6	1,20	1,92
Oak	1,4	1,26	1,76
Beech	1,5	1,24	1,86
Other hardwood	1,6	1,24	1,98
Aspen	3,2	1,20	3,84
Other softwood	2,8	1,20	3,36
Other wood species	2,6	1,20	3,12
Shrubs (all zones)	0,4	1,25	0,5

Activity data, net calorific value, carbon content and carbon oxidation factor, Ukraine, 2008

Table 1 – Activity data for IPCC categories (stationary combustion), 2008

Fuel name	Unit	Fuel code	IPCC category													Total
			1.A.1.a - Public Electricity and Heat Production	1.A.1.b - Petroleum Refining	1.A.1.c - Manufacture of Solid Fuels and Other Energy Industries	1.A.2.a - Iron and Steel	1.A.2.b - Non-Ferrous Metals	1.A.2.c - Chemicals	1.A.2.d - Pulp, Paper and Print	1.A.2.e - Food Processing, Beverages and Tobacco	1.A.2.f - Other	1.A.4.a - Commercial/Institutional	1.A.4.b - Residential	1.A.4.c - Agriculture/Forestry/Fisheries	1.A.5.a - Other/Stationary	
Coal	t	100	35 668 551	0	836 787	898 389	55 723	7 887	5 279	96 840	1 016 537	854 840	1 345 613	54 429	164 429	41 025 304
Briquettes, pellets and similar fuels from coal	t	110	2	0	0	0	0	0	0	5	16	1 080	16	11	0	1 130
Brown coal (lignite)	t	115	0	0	10 085	0	0	0	0	0	9 377	805	1 744	21	24	22 056
Briquettes, pellets and similar fuels from brown coal (lignite)	t	120	390	0	27	0	0	0	0	0	13	2 333	433	14	0	3 211
Fuel peat	t	130	571	0	56 414	0	0	0	3	0	9 366	4 725	10 916	25	0	82 020
Briquettes and semi-briquettes from peat	t	140	1 028	0	1 407	0	53	67	25	423	562	47 029	106 683	302	426	158 005
Crude oil	t	150	0	0	2 537	0	0	0	0	0	645	4	0	0	0	3 186
Gas condensate (Natural Gas Liquids)	t	160	0	10	897	0	0	0	0	0	14	15	0	5	0	941
Natural gas	ths. cbm	170	14 280 851	242 363	693 641	6 907 358	862 117	1 955 161	248 672	1 755 097	5 239 588	1 373 844	17 247 523	660 960	356 580	51 825 757
Petroliferous shale	t	180	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wood	cbm (d)	190	7 511	0	1 302	5	20	493	685	23 477	96 888	323 581	2 006 384	153 973	17 472	2 631 791
Other primary fuels	tce	200	1 618	0	107 376	27	1	54	5	159 757	120 461	21 277	36 941	31 324	5 238	484 280
Middlings and slurry of concentrating mill of ferrous metallurgy	t	210	0	0	1 922	0	0	0	0	0	12 698	0	0	0	0	14 620
Coke oven from coal, brown coal and peat	t	220	1 370	0	230	5	3 334	1 108	0	197	177 185	233	2 003	111	35	186 011
Aircraft gasoline	t	230	0	0	0	0	0	0	0	0	211	137	0	394	2	744
Gasoline	t	240	20	4	19	0	0	26	30	287	396	8 090	0	877	106	9 855
Gas turbine fuel of gasoline type	t	250	0	0	0	0	0	0	0	0	6	1	0	0	0	7
Other light ends	t	260	0	0	0	0	0	6	0	304	1 267	57	72	1 033	342	3 082
Gas turbine fuel of kerosene type	t	270	0	0	0	52	0	0	0	0	4 976	12 111	28	67	11 828	29 064
Motor kerosene	t	280	84	0	1 416	2 118	9	14	10	7	1 036	340	27	190	148	5 398
Kerosene for lighting	t	290	26	0	103	1 139	0	8	2	0	241	11	0	9	108	1 646
Gas/Diesel Oil	t	300	234	25	1 818	50	0	348	8	2 485	13 063	16 758	0	1 365	4 362	40 515
Other intermediate ends	t	310	0	0	318	244	173	473	0	10 158	15 466	8 515	13	2 538	5 553	43 451
Fuel oil (mazut)	t	320	131 442	67 235	2 920	151 348	21	1 900	9	31 590	55 874	17 046	58	5 516	28 899	493 857
Lubricants for cleaning	t	330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lubricants	t	335	383	0	0	0	0	4	0	8	67	24	0	3	3	492
Propane and butane liquefied	t	430	236	100	1 521	43	55	3 117	27	949	3 470	2 292	217 754	3 675	315	233 554
Ethylene, propylene, butylene, butadiene and other oil gases	t	440	0	205 776	0	0	0	3	0	76	62	245	0	4	66	206 232
Petroleum jelly, petrolatum, ozocerite, mineral wax and other	t	450	0	0	0	0	0	14	0	0	11	0	0	0	0	25
Petroleum and shale coke	t	460	0	0	2	60	0	0	0	0	0	0	40	0	0	102
Worked-out lubricants	t	480	95	0	0	491	0	235	0	0	252	40	0	11	287	1 411
Additives oil and fuel	t	490	0	0	0	0	0	0	0	0	10	0	1	0	1	11
Other oils	tce	500	0	422	0	0	0	3	0	309	3 123	577	0	514	966	5 914
Coke oven gas	ths. cbm	600	23 993	0	4 877 357	2 985 519	0	29 020	0	0	23 825	31	0	0	0	7 939 746
Other gas not included in the gases listed above	ths. cbm	625	0	0	0	168 684	0	0	0	31	2 365	3 882	0	0	1	174 963
Other products from fuels processing	tce	630	16 467	84 196	8 037	20 150	467	63 457	0	79 761	5 619	61	82	72	136	278 506

Table 2 – Net calorific value of fuels by IPCC categories (stationary combustion), 2008

Fuel name	Unit	Fuel code	IPCC category												
			1.A.1.a - Public Electricity and Heat Production	1.A.1.b - Petroleum Refining	1.A.1.c - Manufacture of Solid Fuels and Other Energy Industries	1.A.2.a - Iron and Steel	1.A.2.b - Non-Ferrous Metals	1.A.2.c - Chemicals	1.A.2.d - Pulp, Paper and Print	1.A.2.e - Food Processing, Beverages and Tobacco	1.A.2.f - Other	1.A.4.a - Commercial/Institutional	1.A.4.b - Residential	1.A.4.c - Agriculture/Forestry/Fisheries	1.A.5.a - Other/Stationary
Coal	GJ/t	100	21.4	NA	21.7	27.0	23.5	23.3	22.5	25.2	23.6	22.1	21.7	23.1	24.4
Briquettes, pellets and similar fuels from coal	GJ/t	110	20.9	NA	NA	NA	NA	NA	NA	20.9	20.9	20.9	20.9	20.9	NA
Brown coal (lignite)	GJ/t	115	NA	NA	7.1	NA	NA	NA	NA	NA	9.6	6.6	8.4	7.0	12.2
Briquettes, pellets and similar fuels from brown coal (lignite)	GJ/t	120	12.9	NA	14.2	NA	NA	NA	NA	NA	16.6	15.6	15.7	16.1	NA
Fuel peat	GJ/t	130	10.3	NA	10.6	NA	NA	NA	10.8	NA	12.1	10.8	10.8	10.8	NA
Briquettes and semi-briquettes from peat	GJ/t	140	10.0	NA	10.0	NA	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Crude oil	GJ/t	150	NA	NA	41.9	NA	NA	NA	NA	NA	41.9	44.0	NA	NA	NA
Gas condensate (Natural Gas Liquids)	GJ/t	160	NA	41.9	41.9	NA	NA	NA	NA	NA	41.9	41.9	NA	43.6	NA
Natural gas	GJ/ths. cbm	170	34.0	35.3	35.2	33.8	34.1	33.9	33.8	33.8	34.0	33.8	33.9	33.9	33.9
Petroliferous shale	GJ/t	180	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wood	GJ/cbm (d)	190	2.9	NA	7.4	7.0	7.3	7.7	8.1	7.8	7.9	6.8	7.0	7.0	7.5
Other primary fuels	tce	200	29.3	NA	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3
Middlings and slurry of concentrating mill of ferrous metallurgy	GJ/t	210	NA	NA	28.0	NA	NA	NA	NA	NA	28.0	NA	NA	NA	NA
Coke oven from coal, brown coal and peat	GJ/t	220	29.0	NA	28.7	28.6	29.0	29.2	NA	28.7	26.7	29.0	28.6	27.2	28.4
Aircraft gasoline	GJ/t	230	NA	NA	NA	NA	NA	NA	NA	NA	44.6	44.6	NA	44.6	44.6
Gasoline	GJ/t	240	43.7	43.7	43.7	43.7	NA	43.7	43.7	43.7	43.7	43.7	NA	43.7	43.7
Gas turbine fuel of gasoline type	GJ/t	250	NA	NA	NA	NA	NA	NA	NA	NA	42.5	42.5	NA	NA	NA
Other light ends	GJ/t	260	42.5	NA	NA	NA	NA	42.5	NA	42.5	42.5	42.5	42.5	42.5	42.5
Gas turbine fuel of kerosene type	GJ/t	270	NA	NA	44.6	44.6	NA	NA	NA	NA	44.6	44.6	44.6	44.6	44.6
Motor kerosene	GJ/t	280	43.1	NA	43.1	43.1	43.1	43.1	43.1	43.1	43.1	43.1	43.1	43.1	43.1
Kerosene for lighting	GJ/t	290	43.1	NA	43.1	43.1	NA	43.1	43.1	NA	43.1	43.1	NA	43.1	43.1
Gas/Diesel Oil	GJ/t	300	42.5	42.4	42.1	42.9	NA	42.3	42.4	42.5	42.3	42.2	NA	41.9	42.5
Other intermediate ends	GJ/t	310	NA	NA	42.5	42.5	42.5	42.5	NA	42.5	42.5	42.5	42.5	42.5	42.5
Fuel oil (mazut)	GJ/t	320	39.8	42.1	40.7	39.9	39.1	40.2	39.1	40.2	40.4	40.7	40.5	40.6	40.3
Lubricants for cleaning	GJ/t	330	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lubricants	GJ/t	335	40.1	40.1	NA	NA	NA	40.1	NA	40.1	40.1	40.1	NA	40.1	40.1
Propane and butane liquefied	GJ/t	430	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0
Ethylene, propylene, butylene, butadiene and other oil gases	GJ/t	440	NA	54.4	NA	NA	NA	54.4	NA	54.4	54.4	54.4	NA	54.4	54.4
Petroleum jelly, petrolatum, ozocerite, mineral wax and other	GJ/t	450	NA	NA	NA	NA	NA	41.9	NA	41.9	41.9	NA	NA	NA	NA
Petroleum and shale coke	GJ/t	460	NA	NA	31.8	31.8	NA	NA	NA	NA	NA	NA	31.8	NA	NA
Worked-out lubricants	GJ/t	480	40.1	NA	40.1	40.1	NA	40.1	NA	NA	40.1	40.1	40.1	40.1	40.1
Additives oil and fuel	GJ/t	490	NA	NA	NA	NA	NA	NA	NA	NA	40.1	NA	40.1	NA	40.1
Other oils	GJ/tce	500	NA	29.3	NA	NA	NA	29.3	NA	29.3	29.3	29.3	NA	29.3	29.3
Coke oven gas	GJ/ths. cbm	600	16.7	NA	16.7	16.7	NA	16.7	NA	NA	16.7	17.0	NA	NA	NA
Other gas not included in the gases listed above	GJ/ths. cbm	625	NA	NA	NA	8.4	NA	NA	NA	8.4	8.4	8.4	NA	NA	8.4
Other products from fuels processing	GJ/tce	630	29.3	29.3	29.3	29.3	29.3	29.3	NA	29.3	29.3	29.3	29.3	29.3	29.3

Table 3 – Carbon content of fuels by IPPC categories (stationary combustion), 2008

Fuel name	Unit	Fuel code	IPCC category												
			1.A.1.a - Public Electricity and Heat Production	1.A.1.b - Petroleum Refining	1.A.1.c - Manufacture of Solid Fuels and Other Energy Industries	1.A.2.a - Iron and Steel	1.A.2.b - Non-Ferrous Metals	1.A.2.c - Chemicals	1.A.2.d - Pulp, Paper and Print	1.A.2.e - Food Processing, Beverages and Tobacco	1.A.2.f - Other	1.A.4.a - Commercial/Institutional	1.A.4.b - Residential	1.A.4.c - Agriculture/Forestry/Fisheries	1.A.5.a - Other/Stationary
Coal	t C/TJ	100	26.8	NA	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8
Briquettes, pellets and similar fuels from coal	t C/TJ	110	26.8	NA	NA	NA	NA	NA	NA	26.8	26.8	26.8	26.8	26.8	NA
Brown coal (lignite)	t C/TJ	115	NA	NA	27.6	NA	NA	NA	NA	NA	27.6	27.6	27.6	27.6	27.6
Briquettes, pellets and similar fuels from brown coal (lignite)	t C/TJ	120	27.6	NA	27.6	NA	NA	NA	NA	NA	27.6	27.6	27.6	27.6	NA
Fuel peat	t C/TJ	130	28.9	NA	28.9	NA	NA	NA	28.9	NA	28.9	28.9	28.9	28.9	NA
Briquettes and semi-briquettes from peat	t C/TJ	140	28.9	NA	28.9	NA	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
Crude oil	t C/TJ	150	NA	NA	20.0	NA	NA	NA	NA	NA	20.0	20.0	NA	NA	NA
Gas condensate (Natural Gas Liquids)	t C/TJ	160	NA	17.2	17.2	NA	NA	NA	NA	NA	17.2	17.2	NA	17.2	NA
Natural gas	t C/TJ	170	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3
Petroliferous shale	t C/TJ	180	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wood	t C/TJ	190	29.9	NA	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9
Other primary fuels	t C/TJ	200	26.8	NA	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8
Middlings and slurry of concentrating mill of ferrous metallurgy	t C/TJ	210	NA	NA	26.8	NA	NA	NA	NA	NA	26.8	NA	NA	NA	NA
Coke oven from coal, brown coal and peat	t C/TJ	220	29.5	NA	29.5	29.5	29.5	29.5	NA	29.5	29.5	29.5	29.5	29.5	29.5
Aircraft gasoline	t C/TJ	230	NA	NA	NA	NA	NA	NA	NA	NA	18.9	18.9	NA	18.9	18.9
Gasoline	t C/TJ	240	18.9	18.9	18.9	18.9	NA	18.9	18.9	18.9	18.9	18.9	NA	18.9	18.9
Gas turbine fuel of gasoline type	t C/TJ	250	NA	NA	NA	NA	NA	NA	NA	NA	18.9	18.9	NA	NA	NA
Other light ends	t C/TJ	260	18.9	NA	NA	NA	NA	18.9	NA	18.9	18.9	18.9	18.9	18.9	18.9
Gas turbine fuel of kerosene type	t C/TJ	270	NA	NA	19.5	19.5	NA	NA	NA	NA	19.5	19.5	19.5	19.5	19.5
Motor kerosene	t C/TJ	280	19.6	NA	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
Kerosene for lighting	t C/TJ	290	19.6	NA	19.6	19.6	NA	19.6	19.6	NA	19.6	19.6	NA	19.6	19.6
Gas/Diesel Oil	t C/TJ	300	20.2	20.2	20.2	20.2	NA	20.2	20.2	20.2	20.2	20.2	NA	20.2	20.2
Other intermediate ends	t C/TJ	310	NA	NA	20.2	20.2	20.2	20.2	NA	20.2	20.2	20.2	20.2	20.2	20.2
Fuel oil (mazut)	t C/TJ	320	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1
Lubricants for cleaning	t C/TJ	330	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lubricants	t C/TJ	335	20.0	20.0	NA	NA	NA	20.0	NA	20.0	20.0	20.0	NA	20.0	20.0
Propane and butane liquefied	t C/TJ	430	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2
Ethylene, propylene, butylene, butadiene and other oil gases	t C/TJ	440	NA	17.0	NA	NA	NA	17.0	NA	17.0	17.0	17.0	NA	17.0	17.0
Petroleum jelly, petrolatum, ozocerite, mineral wax and other	t C/TJ	450	NA	NA	NA	NA	NA	22.0	NA	22.0	22.0	NA	NA	NA	NA
Petroleum and shale coke	t C/TJ	460	NA	NA	27.5	27.5	NA	NA	NA	NA	NA	NA	27.5	NA	NA
Worked-out lubricants	t C/TJ	480	20.0	NA	20.0	20.0	NA	20.0	NA	NA	20.0	20.0	20.0	20.0	20.0
Additives oil and fuel	t C/TJ	490	NA	NA	NA	NA	NA	NA	NA	NA	20.0	NA	20.0	NA	20.0
Other oils	t C/TJ	500	NA	20.0	NA	NA	NA	20.0	NA	20.0	20.0	20.0	NA	20.0	20.0
Coke oven gas	t C/TJ	600	13.0	NA	13.0	13.0	NA	13.0	NA	NA	13.0	13.0	NA	NA	NA
Other gas not included in the gases listed above	t C/TJ	625	NA	NA	NA	33.0	NA	NA	NA	33.0	33.0	33.0	NA	NA	33.0
Other products from fuels processing	t C/TJ	630	20.0	20.0	20.0	20.0	20.0	20.0	NA	20.0	20.0	20.0	20.0	20.0	20.0

Table 4 – Carbon oxidation factors by IPCC category (stationary combustion), 2008

Fuel name	Unit	IPCC category												
		1.A.1.a - Public Electricity and Heat Production	1.A.1.b - Petroleum Refining	1.A.1.c - Manufacture of Solid Fuels and Other Energy Industries	1.A.2.a - Iron and Steel	1.A.2.b - Non-Ferrous Metals	1.A.2.c - Chemicals	1.A.2.d - Pulp, Paper and Print	1.A.2.e - Food Processing, Beverages and Tobacco	1.A.2.f - Other	1.A.4.a - Commercial/Institutional	1.A.4.b - Residential	1.A.4.c - Agriculture/Forestry/Fisheries	1.A.5.a - Other/Stationary
Coal	100	0.965	NA	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Briquettes, pellets and similar fuels from coal	110	0.98	NA	NA	NA	NA	NA	NA	0.98	0.98	0.98	0.98	0.98	NA
Brown coal (lignite)	115	NA	NA	0.98	NA	NA	NA	NA	NA	0.98	0.98	0.98	0.98	0.98
Briquettes, pellets and similar fuels from brown coal (lignite)	120	0.98	NA	0.98	NA	NA	NA	NA	NA	0.98	0.98	0.98	0.98	NA
Fuel peat	130	0.98	NA	0.98	NA	NA	NA	0.98	NA	0.98	0.98	0.98	0.98	NA
Briquettes and semi-briquettes from peat	140	0.98	NA	0.98	NA	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Crude oil	150	NA	NA	0.99	NA	NA	NA	NA	NA	0.99	0.99	NA	NA	NA
Gas condensate (Natural Gas Liquids)	160	NA	0.99	0.99	NA	NA	NA	NA	NA	0.99	0.99	NA	0.99	NA
Natural gas	170	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995
Petroliferous shale	180	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wood	190	0.98	NA	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Other primary fuels	200	0.98	NA	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Middlings and slurry of concentrating mill of ferrous metallurgy	210	NA	NA	0.98	NA	NA	NA	NA	NA	0.98	NA	NA	NA	NA
Coke oven from coal, brown coal and peat	220	0.98	NA	0.98	0.98	0.98	0.98	NA	0.98	0.98	0.98	0.98	0.98	0.98
Aircraft gasoline	230	NA	NA	NA	NA	NA	NA	NA	NA	0.99	0.99	NA	0.99	0.99
Gasoline	240	0.99	0.99	0.99	0.99	NA	0.99	0.99	0.99	0.99	0.99	NA	0.99	0.99
Gas turbine fuel of gasoline type	250	NA	NA	NA	NA	NA	NA	NA	NA	0.99	0.99	NA	NA	NA
Other light ends	260	0.99	NA	NA	NA	NA	0.99	NA	0.99	0.99	0.99	0.99	0.99	0.99
Gas turbine fuel of kerosene type	270	NA	NA	0.99	0.99	NA	NA	NA	NA	0.99	0.99	0.99	0.99	0.99
Motor kerosene	280	0.99	NA	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Kerosene for lighting	290	0.99	NA	0.99	0.99	NA	0.99	0.99	NA	0.99	0.99	NA	0.99	0.99
Gas/Diesel Oil	300	0.99	0.99	0.99	0.99	NA	0.99	0.99	0.99	0.99	0.99	NA	0.99	0.99
Other intermediate ends	310	NA	NA	0.99	0.99	0.99	0.99	NA	0.99	0.99	0.99	0.99	0.99	0.99
Fuel oil (mazut)	320	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Lubricants for cleaning	330	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lubricants	335	0.50	0.50	NA	NA	NA	0.50	NA	0.50	0.50	0.50	NA	0.50	0.50
Propane and butane liquefied	430	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995
Ethylene, propylene, butylene, butadiene and other oil gases	440	NA	0.995	NA	NA	NA	0.995	NA	0.995	0.995	0.995	NA	0.995	0.995
Petroleum jelly, petrolatum, ozocerite, mineral wax and other	450	NA	NA	NA	NA	NA	0.99	NA	0.99	0.99	NA	NA	NA	NA
Petroleum and shale coke	460	NA	NA	0.98	0.98	NA	NA	NA	NA	NA	NA	0.98	NA	NA
Worked-out lubricants	480	0.50	NA	0.50	0.50	NA	0.50	NA	NA	0.50	0.50	0.50	0.50	0.50
Additives oil and fuel	490	NA	NA	NA	NA	NA	NA	NA	NA	0.50	NA	0.50	NA	0.50
Other oils	500	NA	0.99	NA	NA	NA	0.99	NA	0.99	0.99	0.99	NA	0.99	0.99
Coke oven gas	600	0.995	NA	0.995	0.995	NA	0.995	NA	NA	0.995	0.995	NA	NA	NA
Other gas not included in the gases listed above	625	NA	NA	NA	0.995	NA	NA	NA	0.995	0.995	0.995	NA	NA	0.995
Other products from fuels processing	630	0.98	0.98	0.98	0.98	0.98	0.98	NA	0.98	0.98	0.98	0.98	0.98	0.98