

Annex 32: Additional information for Contracts

Additional information for Contracts

Development of Methodology for calculation of emissions and removals for LULUCF sector according to requirements of UNFCCC and Kyoto Protocol.

Contract – 1481/24.11.2009 (see Annex “Contract_LULUCF”)

Executor – University of Forestry

Duration – 5 months (from the data of contract)

Deliverables:

1. to fulfil the requirements of UNFCCC and KP concerning the LULUCF sector (15/CMP.1, 16/CMP.1 and 17/CMP.1)
2. to complete reporting in all mandatory categories
3. to enhance transparency of activity data, emission factors and methods in NIR
4. to enhance the resources and create the capacity of Inventory team for LULUCF sector

Recalculations of previously submitted estimates of emissions under UNFCCC and EMEP/CLRTAP according to the new Common Methodology from the base year to all subsequent years, up to the year in which the recalculations are made and cover all inventory data (from 1980 for SO₂, NO_x, NH₃, NMVOC and CO under CLRTAP to 2008 for all pollutants).

Contract – 1484/01.12.2009 (see Annex “Contract_Recalculation”)

Executor – Geophysical Institute under BAS (Nicolay Miloshev)

Duration – 14 months (from the data of contract)

Deliverables:

1. to improve the quality of the emission estimates of the national inventories
2. to escape the unexplained changes in the Implied Emission Factors
3. to escape the differences between both Conventions (UNFCCC and CLRTAP)
4. to ensure the traceability of fuel consumption data

National study for determine the quantity of actual F-gases (HFCs, PFCs and SF₆) in Bulgaria and methods for their calculations.

Contract №1505/28.12.2009 (see Annex “Contract_F_gases”)

Duration – 8 months (from the data of contract)

Executor – Consortium Denkshtat

Deliverables:

1. to improve the completeness of the emission estimates of the national inventories
2. to estimate the actual emissions of F-gases for the whole time-series

Development of software tool for automatic preparation of national inventories under UNFCCC and EMEP/CLRTAP.

Contract – 1504/28.12.2009 **see Annex “Contract_Software”**

Duration – 12 months (from the data of contract)

Executor - SM Konsulta

Deliverables:

1. to improve the quality of the emission estimates of the national inventories
2. to ensure timely performance of the national inventories
3. to escape the differences between both Convention (UNFCCC and CLRTAP)
4. to escape the mistakes from hand-made calculations

Final preparation of the GHGs inventory for year 2008

Contract № D-30-26/20.04.2010 **see Annex “Contract_Energy_Institute”**

Executor -Energy Institute

Duration-12 months (from the data of contract)

Main tasks and activities:

1. To prepare a final version of the inventory for year 2008 as well as to prepare revised national report in accordance with the requirements of “annotated content of National inventory report” in the volume which is possible within the envisaged deadline and with the available information? The Ministry of environment and water on the 15 of April to present the inventory and the report to the UN Secretariat.
2. To include in the inventory data for the sector "Change in land use and forestry”, incl. the tables and the part of the National report, which is performed under contract with an external organization.
3. To carry out adjustments of the sources with recorded inaccuracies in 2008 and 2009 for 2006 and 2007 inventories (gas transmission and distribution, transport patterns, etc.) which are identified by the UN or to be identified by the Institute for Energy. The adjustments for 2006 and 2007 completed by the 15 of April to be included in the presentation of the inventory to the Secretariat.
4. To implement the system for quality assurance and quality control.

Annex 33a: National QA/QC Plan (Annex 1)

received in Cyrillic

Annex 33b: National QA/QC Plan (Annex 2)

Check list for total and specific procedures for QA/QC under UNECE and UNFCCC

		Annex 1 to National QA/QC Plan					
Input data	Category	Check/review of data			Data correction		
		Institution/expert	Date of check	Findings Y/N	Institution/expert	Date of correction	Comments
Source of input data Check for correct distribution of input data by existing SNAP							
1							
2	Confirmation of write distribution of input data						
Kind of the Data							
3	Check for correct documentation of activity data and EIs						
4	Check for correct description of dimensions and values of AD and EIs						
5	Check that dimensions of input data are correct presented in the relevant reporting tables						
6	- Check for existing of emissions data for all expected pollutants by sectors - Confirmation for correct using of parameters for emissions estimating - time series						

7	Check, that external institutions are well introduced in all procedures for QA and if these procedures are correctly applied and documented								
8	Check of quality of confidential data by direct access and review or indirect by official report that the data are checked and approved in advance								
9	Other checks								
	Calculations								
10	- Review if all categories are included - check for correct using of NO, NE, IE, NA, C								
11	Check for double using of input data								
12	Check of dimensions								
13	Check for correct estimation of emissions								
14	Other								
	Check of outputs								
15	Identification of methodological mistakes								
16	Transparency of input data in the output files and documents								

17	Check for correct aggregation of the emissions by sectors and on a national level									
18	Check for correct formatting of output information									
19	Check of consistency of time series									
20	Check of comparability with other Parties									
21	Other checks									

Annex 34a: National QA/QC Plan (Annex 2)

received in Cyrillic

Annex 34b: National QA/QC Plan (Annex 2)

Приложение 2

Резюме на резултатите от проверките и корекциите

Ивентаризация – XXXXгодина

NFR код - XXXX

Категория

CRF код – XXXX

Експерт

Дата: XX.XX.XX

Резюме на резултатите от проверките и корекциите	
Резюме на резултатите от проверките и корекциите:	
Предложения за бъдещи проверки: PROPOSAL	Проблеми оставащи и след корекциите:

Annex 35a: National QA/QC Plan (Annex 3)

received in Cyrillic

Annex 35b: National QA/QC Plan (Annex 3)

Summary / attendees file

Приложение 3

Придружаващ файл (ПФ) на отговорника за осигуряване и контрол на качеството (ООКК)							<i>comment</i>
Проверяващ	Дата <i>date</i>	Инь. XXXXг.	Сектор <i>sector</i>	NFR/CRF код	Констатирани грешки и препоръки <i>mistake and recommendations</i>	Коригираш <i>date</i>	Коментар на коригираща (проверяваща) по отношение на извършените промени
				1			
				1.A.3.			
				1.B			
				2			
				2.E, 2.F			
				3			
				4			
				5			
				6.A.			



Annex 36: National QA/QC Plan -Ministry of Environment and Waters

Ministry of Environment and Waters

**Approved:
Minister
(Nona Karadzova)**

Plan for quality insurance, quality control, quality assessment and reliability verification of the data from the National inventory of harmful substances emissions, to the Convention on Long-Range Transboundary Air pollution (CLRTAP) and the United Nations Framework Convention no Climate Change (UNFCCC).

This plan regulates the activities on Quality assurance (QA), Quality control (QC), and Reliability Verification (RV) of the applied data, as well as the institutional activities and responsibilities implementing these activities. In the plan is also contained, the appointed time period, covering the year cycle for inventory preparation, from its beginning to the conclusive reporting for the corresponding year and delivering the final report with the inventory assessment and improvement recommendations. The plan includes the following three elements: stages and responsible institutions, activities, time schedule.

All activities and instructions relevant to data preparation and reporting to CLRTAP and UNFCCC.

Table 1

Activity	Institution
Natural indexes	NSI, MAF, EFA, MEET, MI, NEC, MOEW, ExEA
Methods, emission factors	MOEW, ExEA
Calculations	ExEA, NSI
Uncertainty	ExEA
Filling in CRF and NFR tables	ExEA
Reporting	MOEW, ExEA

1. Main stages of the inventory process and responsible institutions.

1.1 Preparation of electronic inventories

- Responsible institutions to UNFCCC

Activity category/ CRF code	Natural indexes	Calculations
Energy - 1	NSI	ExEA
Energy – 1.A.3	NSI/MI	ExEA
Energy- 1.B	NSI/MEET	ExEA
Industrial processes - 2	NSI	ExEA
Industrial processes – 2E, 2F	NEC/MOEW	ExEA
Solvents – 3		ExEA

Agriculture – 4	AS/MAF	ExEA
LULUCF	5	ExEA
Wastes – 6A	NSI	ExEA
Wastes – 6B, C	NSI/ExEA	ExEA

Responsible institutions to CLRTAP

Activity category/ CRF code	Natural indexes	Calculations
Energy - 1	NSI	NSI
Energy – 1.A.3	NSI	NSI
Energy- 1.B	NSI	NSI
Industrial processes - 2	NSI	NSI
Industrial processes – 2E, 2F	NSI	NSI
Solvents – 3	NSI	NSI
Agriculture – 4	NSI	NSI
Wastes – 6A	NSI	NSI
Wastes – 6B, C	NSI/ExEA	NSI/ExEA

1.2 National inventory preparation

EEA is responsible for coordinating the activity of all institutions involved in the inventory preparation process for each sector.

The final preparation of inventories to CLRTAP and UNFCCC at national level, so as the corresponding accompanying reports is responsibility of the ExEA.

The team for the final preparations of national inventories is compound of expert from “Monitoring of the environment” directorate, “Air monitoring” department.

- Expert responsible for the inventory preparations:

Head of department “AM”, Team leader

2 experts from “AM” department for the CLRTAP

2 experts from “AM” department for the UNFCCC

- Sector experts:

2 experts from “AM” department for the CLRTAP

2 experts from “AM” department for the UNFCCC

- Persons in charge for Quality Insurance (PQI) at national level:

1 expert from “AM” department for the CLRTAP

1 expert from “AM” department for the UNFCCC

1.3. Reporting

Reporting Bulgaria’s national inventories to the CLRTAP secretariat and UNFCCC secretariat and EC secretariat is obligation of the Ministry of environment and waters (MOEW). Agreements are carried out as follows:

- CLRTAP – “Air purity conservation” directorate, “Global atmospheric processes” department.

- UNFCCC – “Investment policy, public orders and climate” directorate, “Climate change policy” department.

- Reporting Bulgaria's national inventories to the European Environment Agency for CLRTAP and UNFCCC is obligation of the Executive Environment Agency (ExEA), "Air monitoring" department.
- Data from both inventories (including also the reports) on the CDR portal of the EEA is to be published by the ExEA.

2. Quality assurance and Quality control activities.

2.1 Quality assurance

Quality assurance is set by:

- Institutions responsible for natural indexes. These institutions are pointed out in table 1. All state institutions, involved in the inventory preparation process in accordance with their law-regulated responsibilities and official engagements.
- Methods, used for the inventory process and the choice of emission factors. Methods utilized are developed using EMEP/CORINAIR Emission Inventory Guidebook 2006 and IPCC methods. Methods are approved by the minister of Environment and Waters with order №ПД-77/03.02.2006.
- Software for data calculation – for UNFCCC is used CRF and for CLRAP – NFR.

2.2. Quality control procedures

All QA procedures are carried out by experts involved in every stage of the inventory process (natural indexes, sector inventory, and national inventory) during their coordination by the persons in charge of QA and QC at the ExEA.

QA procedures include the following 6 steps:

Step 1. QA/QC Manager develops QA/QC Plan. Inventory Team Leader approves it. QA/QC Manager reviews the draft attendant file (AF) for the previous inventory and prepares preliminary AF for current inventory.

Step 2. According to QA/QC Plan the inventory (or part of inventory) is sent for check and review.

Step 3. QA/QC Manager obtains the results of check and review.

Step 4. QA/QC Manager registers findings in the checklist (CL) and AF, as well as processes this information and marks decision about corrective actions.

Step 5. The person who is responsible for corrective actions carries out this work and reports to QA/QC Manager for updating checklist attendant file.

Step 6. QA/QC Manager prepares the QA/QC chapter to the Inventory Report and a draft AF for the next inventory.

Control sheets are filled in for each activity category (NFR for CLRTAP and CRF for UNFCCC), generating emissions of harmful substances in air and greenhouse gases, by the experts responsible for data input for natural indexes an/or data calculations and persons in charge for QAC at sector and national level.

List of categories, for which a control sheet has to be filled in.

Table 4

No	Activity Category	NRF/CRF code	Note
1	Energy	1	Data from the NSI
2	Energy	1.A.3	Data from the NSI and MI – transport
3	Energy	1.B	Data from the NSI and MEET
4	Industrial processes	2	Data from the NSI
5	Industrial processes	2E, 2F	Data from MOEW/APC and the NEC
6	Solvents	3	Data from the NSI
7	Agriculture	4	Data from MAF/AS
8	LULUCF	5	Data from the EFA
9	Waste	6.A	Data from the NSI
10	Waste	6.B,C	Data from the NSI/ExEA

For each category, a separate control list has to be filled in, which contains verification of input data, emission calculations and output data. Institutions responsible for data verification and data correction for the corresponding categories for UNFCCC and CLRTAP are specified to the control sheets.

Institutions responsible for data verifications and data correction for the corresponding categories for the UNFCCC

Table 5

Activity category/ CRF code	Input data		Calculations		Output data	
	Verification	Correction	Verification	Correction	Verification	Correction
Energy – 1	NSI	NSI		ExEA		ExEA
Energy – 1.A.3	NSI/MI	NSI/MI		ExEA		ExEA
Industrial processes - 2	NSI/MEET	NSI/MEET		ExEA		ExEA
Industrial processes – 2E, 2F	NSI	NSI		ExEA		ExEA
Solvents – 3	NSI	NSI		ExEA		ExEA
Agriculture – 4	MAF/AS	MAF/AS		ExEA		ExEA
LULUCF – 5	EFA	EFA		ExEA		ExEA
Waste – 6.A	NSI	NSI		ExEA		ExEA
Waste – 6.B.,C	NSI/ExEA	NSI/ExEA		ExEA		ExEA

Institutions responsible for data verifications and data correction for the corresponding categories for the CLRTAP

Table 6

Activity category/ CRF code	Input data		Calculations			Output data	
	Verification	Correction	Verification to SNAP	Verification to NFR	Correction	Verification	Correction
Energy – 1	NSI/ExEA	NSI	NSI	ExEA	NSI/ExEA		ExEA
Energy – 1.A.3	NSI/ExEA	NSI	NSI	ExEA	NSI/ExEA		ExEA
Energy – 1.B	NSI/ExEA	NSI	NSI	ExEA	NSI/ExEA		ExEA
Industrial processes – 2	NSI/ExEA	NSI	NSI	ExEA	NSI/ExEA		ExEA
Solvents – 3	NSI/ExEA	NSI	NSI	ExEA	NSI/ExEA		ExEA
Agriculture – 4	NSI/ExEA	NSI	NSI	ExEA	NSI/ExEA		ExEA
Waste – 6.A	NSI/ExEA	NSI	NSI	ExEA	NSI/ExEA		ExEA
Waste 6.B.,C	NSI/ExEA	NSI/ExEA	NSI/ExEA	ExEA	NSI/ExEA		ExEA

Summary of verifications and corrections to the control sheets is presented in annex 2. The summary file, used by the person in charge for QAC is presented in annex 3.

2.2 Quality assessment procedures

The procedures for Quality assessment are 4 types in general

- Examination by expert – carried out by national experts and sector experts
- Vertical audit – done for key objects, emission sources. Carried out by sector experts and national experts.
- Internal audit – carried out by APC department and IPPOC
- External audit – carried out by authorized auditing parties for each convention.

Quality assessment procedures include:

- Transparency – accurate and clear presentation of the inventory in the national report
- Data completeness check – for each sector, pollutant, natural index and emission factor,
- Comparativeness of data in all elements – comparativeness check of results with the results from previous years, including comparativeness of natural indexes. Check for unexpected leaps or drop in time series. Comparativeness with national inventories of other countries (methods, forms etc.).

2.4. Inaccuracy assessment

Inaccuracy assessment is carried out according to the Good Practice Guideline.

General inaccuracy is related with data inaccuracy for emission sources(fuels, activities, processes etc.) and inaccuracy of emission factors.

Inaccuracy of the natural indexes is determined during data collection and processing (including human error) and is part of the procedures applied in each institution pointed out in table 3.

Inaccuracy of emission factors is related with the origin of factors applied(methods, expert assessment and instrument measurements).

During inaccuracy determination the following data is used:

- standard allowed statistical difference, with which the general energy and material balance of the country is bounded.
- specific assessments from the Good Practice Guideline
- Expert ratings of Bulgarian and foreign specialists for activities in agriculture, waste management etc.

- literal data and information from inventory inspections of other countries.

2.5. Reliability verification activities

Reliability verification activities can be carried out by means of:

- Comparison of emissions, calculated by methods, different than the methods used for national inventory preparation.
- Comparison of emission data, given by inventories, carried out separately from the national inventory
- Comparison with emission data, obtained through instrument measurements of key objects
- Application of lower-level method (Tier-1) – based on bigger generalization of data for each category (top-to-bottom approach) which makes it less sensitive to errors. The data used is from national statistics. Quality of this method is lower compared to other methods (Tier-2 and 3), and it is used as approximation method for emission assessment.
- Application of higher-level method (Tier-2 and 3) – based on more detailed data for each category (bottom-to-top approach) and more detailed determination of subcategories, sources and sample taking instruments. Implementation of specific data for each emission source in the country, which makes them more difficult for application due to lack of data and resources.

2.6 Procedures for reporting, documenting and archiving

Documenting and archiving

Documenting and archiving is performed by the parties responsible for (QA/QC) and is verified by the inventory manager. All intermediate and final files, created in the inventory process, are documented.

The information is classified as follows:

Institutional information:

- responsibilities and institutional agreements for performing of planning procedures, preparation and management of the inventory process;
- Contact details of the responsible persons within the cooperated institutions.

Methodological information:

- methodology used, including for evaluating errors, recalculation and validity check;
- justification of the applied methodology;
- preconditions and selection criteria for input data and emission factors;
- adjustments to input data or the methodology, compared to previous inventory or recalculation;
- identity of the institutions and experts that have provided the emission factor data, error evaluation and validity check, including their qualification.

Data:

- emission factors and other evaluation parameters, including their sources;
- applicable national methodology;
- IPCC or CORINAIR;
- Other sources – published reports or other emission factors based on higher Tier methods;
- Input data or information that justifies the relation between data and the corresponding emission source;
- Information related to the precision of the input data and emission factors.

Documentation should be collected and recorded for every emission source category as follows:

- description;
- information related to the completeness of data;
- methodology;
- data sources for the actions, emission factors and emissions;
- error evaluation;
- recalculation;
- planned improvement;

Technical issues:

- details of the databases and software used for the inventory, including version information, instruction manuals, hardware requirements and any additional information that may be required for their future use;
- working papers and intermediate calculations of the evaluations by category, aggregate results and all recalculations of previous assessments;
- archiving of the complete database, including any working files used in the inventory process, to ensure that the inventory process can be recreated. The data should be stored in a stand-alone computer and on a network server with managed access, and separately on a DVD.

QA/QC:

- QA/QC plans;
- Recording of all KK QA/QC Procedures (CS and ??);
- Inventory management report;

Final inventory report and trend analysis based on data from previous years.

Internal inventory management report

The internal report must contain the following sections:

Input data (real indicators):

- effected changes in the institutional agreements, affecting the flow of data from the provider to the team responsible for the inventory;
- notes on significant tendencies in the time series, especially in cases of significant deviation. These should include comments on the effect of recalculations and other activities performed to minimize the differences.

QA/QC:

- a description of the internal procedure and external evaluation for every category and for the inventory as a whole;

- a description of the performed QA/QC procedures – when and how they have affected the inventory results.

Inventory improvement recommendations:

- A summary of key findings and conclusions, describing important changes related to the quality of input data, methodologies, evaluations, etc., for every category and the inventory as a whole;
- Suggestions for improving the inventory.

3. Timetable with intermediate terms and deadlines, according to the reporting requirements in the Conventions and Resolutions of the EC.

No	Activity	Start date	Deadline	Comment
1	NSI sends its form to all enterprises in the country	31.03.XX	15.06.XX	
2	ExEA, AM department sends inquiries to: MEET – SNAP 010506 and 0506 NEC and all TPPs and HP in the country – SNAP 060507 Glass factories – 040619 MOEW – APC SNAP 0605 MAF/AS SNAP 1000, 1105, and 112104; NFA SNAP 1111, 1121 and 1112	31.03.XX	15.06.XX	
3	NSI processes, checks and verifies the input data.		30.09.XX	
4	NSI send the input data to the ExEA		30.10.XX	
5	ExEA processes, checks and verifies the input data		31.11.XX	
6	NSI sends to ExEA Manterial and Energy Balance(MEB) and Industrial production (IP)		15.12.XX	
7	Performing initial calculation for the		20.12.XX	

	inventory			
8	NSI send to ExEA corrections to its form, as result for MEB and ID codes		31.12.XX	
9	Performing recalculations, based on corrections for NSI, MEB and IP		31.12.XX	
10	Preliminary national inventory report (NIR) to UNFCCC and EU decisions		10.01.XX+1	
11	Reporting the annual GHG inventory to the UNFCCC with the preliminary NIR		15.01.XX+1	
	Reporting the annual inventory to the CLRTAP		15.02.XX+1	
	Preliminary National Inventory Report to the CLRTAP		28.02.XX+1	
12	Reporting the final annual GHG inventory to the UNFCCC together with a complete NIR		15.03.XX+1	
13	Reporting the final annual inventory of GHG and NIR after EC comment aided by the ExEA		15.04.XX+1	
14	Final documenting, archiving and report for inventory management for both conventions		15.05.XX+1	
15	Preparations(update) of a plan for QA/QC, RC for the next inventory		15.06.XX+1	

Annex 37: Official letter no 91-00-4512 from 26th of august 2009

received in Cyrillic

Annex 38: Answer of the relevant organizations with QA/QC experts

NOT received

Annex 39: QA plan for 2008 inventory

received in Cyrillic

Annex 40a: Improvement Plan 2010

Improvement plan 2010

Recommendation	Data received	Data of implement	Sector experts	Problems
General				
Lack of interpretation of the emission trends in the NIR (e.g. information on the key drivers behind the trends is missing)	Review 2008	Submission 2010 and 2011	SEs	
Key categories in table 7 of the CRF it has not included the LULUCF sector as part of its key category analysis, and it reported the key categories aggregated and organized in alphabetical order, with category names that do not fully correspond to the Intergovernmental Panel on Climate Change (IPCC) categories. The key category analyses reported in the NIR and CRF tables are not consistent and are not fully in accordance with 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).	Review 2008	Submission 2010 and 2011	NIC	
Improve completeness of the reporting, in particular for actual emissions of F-gases for the complete time series.	Review 2008	Submission 2010 and 2011	SEs	
Completeness Estimate emissions from the categories currently reported as not estimated (.NE.) where there are IPCC methods available, and in particular actual emissions of F-gases for all relevant categories and for the complete time series Improve documentation of the LULUCF activities and categories, in particular those for which reporting is mandatory under the Kyoto Protocol (afforestation, reforestation and deforestation activities),	Review 2008	Submission 2010 and 2011	SEs	

and provide estimates for the missing LULUCF categories.				
<p>Transparency</p> <p>Continue efforts and further increase transparency of the NIR by providing clear country-specific information and full descriptions of methods, EFs and AD, especially for key categories.</p>	Review 2008	Submission 2010 and 2011	SEs	
<p>Uncertainties</p> <p>Include the LULUCF sector in its uncertainty analysis and use it to prioritize further improvements in the inventory.</p> <p>Improve the quality of the uncertainty analyses by obtaining country-specific uncertainty AD values, particularly for key categories, and provide more details on country-specific uncertainty values used in the key category analysis.</p>	Review 2008	Submission 2010 and 2011	SEs	
<p>5. Verification and quality assurance/quality control approaches</p> <p>Elaborate the QA/QC plan by providing detailed information on specific activities and a time schedule for its implementation.</p> <p>Include the detailed QA/QC plan and the implemented tier 1 QC procedures as an attachment to the.</p> <p>Consider possibilities for implementing tier 2 procedures for selected key categories, and for involving qualified external experts in the QA activities.</p>	Review 2008	Submission 2010 and 2011	QA_QC manager	
Energy				
<p>The following categories are reported as NE:</p> <ol style="list-style-type: none"> 1. CO2 emissions from solid fuels; 2. CO2 and N2O emissions from oil and natural gas; 3. CH4 emissions from oil exploration, natural gas exploration, venting combined and flaring combined. <p>The ERT recommends that Bulgaria estimate emissions from the categories currently not estimated, for which IPCC methods are available, and include them in its next annual submission.</p>	Review 2008	Submission 2010 and 2011	SEs	No AD, Efs and M available
Bulgaria provide references in the NIR to primary data sources for the calorific values, carbon contents and oxidation factors, for liquid fuels and natural gas. Bulgaria should also identify where changes in	Review 2008	Submission 2010 and 2011	SEs	

the CO2 EFs have occurred in the times series, and explain why such changes have occurred.				
Bulgaria should conduct an independent expert sectoral review of AD in order to explain large inter-annual variations in CO2 emissions from key categories such as manufacturing industries and construction	Review 2008	Submission 2010 and 2011	SEs	
Bulgaria implements sectoral QC checks relating to cross-checking of the CRF tables and the NIR by sectoral experts from the inventory compiling agency.	Review 2008	Submission 2010 and 2011	SEs	
Bulgaria should provide in the documentation box of table 1.A(c) a brief explanation of the cause of any differences between the two approaches greater than 2 per cent. A reference or link should also be provided to the relevant section in the NIR where any differences are explained in more detail.	Review 2008	Submission 2010 and 2011	SEs	
Revise assumptions and review available data for the allocation of fuel consumption between civil aviation and aviation bunkers for the complete time series, and ensure consistency, correcting if necessary, of the AD used in emission estimations in strict accordance with the IPCC good practice guidance.	Review 2008	Submission 2010 and 2011	SEs	
Revise assumptions and available data for the allocation of fuel consumption between navigation and marine bunkers for the complete time series, and ensure consistency, correcting if necessary, of the AD used in emission estimations in strict accordance with the IPCC good practice guidance. Include clear and detailed documentation on methods, AD and assumptions used in the emission estimates for aviation and marine bunkers in the NIR of its next annual submission.	Review 2008	Submission 2010 and 2011	SEs	
Improve the documentation of the treatment of feedstocks and non-energy use of fuels in the NIR. Details should be provided on which categories CO2 emissions are allocated to following deduction from	Review 2008	Submission 2010 and 2011	SEs	

the energy sector, both in the NIR and in the appropriate additional information box in CRF table 1.A(d).				
Stationary combustion: solid and liquid fuels, CO2	Review 2008	Submission 2010 and 2011	SEs	
Bulgaria reports the use of a tier 2 method with country-specific and default EFs for its emission estimates in this category. Recommendation: include more details and background information on these issues in the NIR of its next annual inventory submission.	Review 2008	Submission 2010 and 2011	SEs	
Bulgaria states in the NIR that the category 1.A.2f other includes emissions from auto-producer plants for combined production of electricity and heat. The previous review report notes that some of the auto-producers are registered as separate entities. Recommendation: emissions from such entities be reported under public electricity and heat production.	Review 2008	Submission 2010 and 2011	SEs	
Provide more background information on the emission trends and on sources and changes in EFs, at least for key categories.	Review 2008	Submission 2010 and 2011	SEs	
Road transportation: liquid fuels, CO2				
Bulgaria reports the use of a tier 2 method with country-specific EFs for its emission estimates in this category. Include precise information on the sources of these EFs and provide background information on the emission trends and reasons for possible changes of EFs in the NIR.	Review 2008	Submission 2010 and 2011	SEs	
Civil aviation: liquid fuels, CO2 Lack of explanation of the factors driving the trends. Improve the explanation of trends and consider including such information on trends in the NIR. Revise its assumptions and review available data for its estimates under this category, and check them for consistency, including the allocation of fuel consumption between civil aviation and aviation bunkers for the complete time series, correcting if necessary the AD used in strict accordance with the IPCC good practice guidance.	Review 2008	Submission 2010 and 2011	SEs	
Navigation: liquid fuels, CO2	Review 2008	Submission	SEs	

Include clear and detailed information on AD, EFs and their sources and provide the necessary background information on the emission trends.		2010 and 2011		
Other transportation: liquid fuels, CO2 Bulgaria is reporting under the category other transportation, emissions from agriculture and construction sources, such as agriculture machinery for land cultivation, wood processing machinery, and construction machinery. This is not in accordance with the Revised 1996 IPCC Guidelines and the IPCC good practice guidance. These emission sources should be allocated to the agriculture/forestry/fisheries and the manufacturing industries and construction categories, as appropriate. RECOMMENDATION: reallocate these emissions to the appropriate categories in accordance with the Revised 1996 IPCC Guidelines and the IPCC good practice guidance, and include emissions from pipeline transport of natural gas under the category other transportation.	Review 2008	Submission 2010 and 2011	SEs	
Include precise information on AD used, and the sources of EFs, and provide background information on the emission trends in the NIR, and also correct the detected mistakes and implement QC procedures.	Review 2008	Submission 2010 and 2011	SEs	
Road transportation: liquid fuels - N2O Revise the EFs used for the complete time series and document clearly its sources in the NIR, and also correct the detected mistakes and implement QC procedures.	Review 2008	Submission 2010 and 2011	SEs	
Oil and natural gas - CH4 Estimate emissions from these and other subcategories currently not estimated under oil and natural gas, for which IPCC methods are available, and include them. In estimating CH4 emissions from oil refining/storage, the ERT noticed that only the IPCC default EF for the storage component has been applied. Recommendation that Bulgaria also include the default EF for the	Review 2008	Submission 2010 and 2011	SEs	

refining component in the estimation methodology, and revise the estimates of this subcategory.				
III. Industrial processes and solvent and other product use				
Improve the transparency of the inventory, especially for the key categories, by giving more information about data collection, methodologies, EFs, QA/QC and verification activities.	Review 2008	Submission 2010 and 2011	SEs	
The following categories are reported as .NE. in 2006: HFCs and PFCs from consumption of halocarbons and SF6; CO2 from asphalt roofing; SF6 emissions from solvents under consumption of halocarbons and SF6; and CO2 emissions from the paint application and degreasing and dry cleaning categories under solvent and other product use. In addition, SF6 emissions from electrical equipment are not reported in sectoral background table 2(II).F, but they are reported in the sectoral report tables. Estimate actual emissions of HFCs, PFCs and SF6 from the consumption of halocarbons and SF6 for all relevant categories and for the complete time series, as well as the potential emissions from these gases, and report them.	Review 2008	Submission 2010 and 2011	SEs	
Cement production Include in the NIR more detailed information on the methodology, AD and EFs used and the verification activities undertaken, and additional information on the types of cement produced in the country and the composition of cement and clinker.	Review 2008	Submission 2010 and 2011	SEs	
CO2 emissions from lime production Implement a tier 2 methodology taking into account the composition of lime when estimating the EF, in line with the IPCC good practice guidance.	Review 2008	Submission 2010 and 2011	SEs	
N2O emissions from nitric acid production Provide more detailed explanations of the methodology, EFs and AD used and background information in order to increase transparency.	Review 2008	Submission 2010 and 2011	SEs	
CO2 emissions from iron and steel production	Review 2008	Submission	SEs	


Improve the documentation of the methodology in the NIR, and include basic information on the methodology, the calculation of the EFs and the AD used		2010 and 2011		
AD are reported for steel production Reassess the need for confidential information for these years. Report in the NIR all relevant information that could help the review if the AD continue to be confidential, for example indexed information relative to base year. The relevant information could include the number of plants, the production process and the total steel production capacity	Review 2008	Submission 2010 and 2011	SEs	
CO2 from ammonia production Provide in the NIR, more detailed information on the methodology used to estimate CO2 emissions from ammonia production.	Review 2008	Submission 2010 and 2011	SEs	
Make the necessary efforts to estimate actual HFC emissions for the entire time series as this category is likely to be a key category, and to include clear and detailed explanations of the estimation methodology, AD and EFs in the NIR. This recommendation is also applicable to PFCs and SF6 emissions from this category.	Review 2008	Submission 2010 and 2011	SEs	
Agriculture				
Provide clear and detailed documentation on methods, including equations used, the choice of EFs and other key input parameters for the emissions estimates in the NIR.	Review 2008	Submission 2010 and 2011	SEs	
Include detailed information in the NIR on AD and trends and make efforts to improve the consistency of AD in the time series.	Review 2008	Submission 2010 and 2011	SEs	
CH4 emissions from enteric fermentation Use higher tiers in its emission estimates for significant animal species, as recommended in the IPCC good practice guidance.	Review 2008	Submission 2010 and 2011	SEs	
CH4 emissions from manure management, Give further information in the NIR on other systems, and explain the derivation of corresponding MCFs.	Review 2008	Submission 2010 and 2011	SEs	
Implement QC procedures for the agriculture sector	Review 2008	Submission 2010 and 2011	SEs	

Bulgaria uses a country-specific EF of 40.27 g/m ² based on expert assessment for its estimations under the continuously flooded rice cultivation category. document the choice of the EF and provide a detailed explanation on its calculation.	Review 2008	Submission 2010 and 2011	SEs	
Land use, land-use change and forestry				
Make the necessary efforts to include those missing mandatory categories that are currently not estimated and are likely to be relevant for the country (e.g., land converted to forest land, grassland remaining grassland, biomass burning). Further develop and enhance the existing procedures for inventory preparation in the LULUCF sector to enable the provision of accurate information on land areas subject to activities such as deforestation, reforestation and afforestation, to meet future reporting needs.	Review 2008	Submission 2010 and 2011	SEs	
Describe in detail all information relating to estimations, including data collection and definition for each land category, in the NIR. Make efforts to have an adequate, consistent, complete and transparent approach to represent land areas in its LULUCF inventory, in accordance with the IPCC good practice guidance for LULUCF.	Review 2008	Submission 2010 and 2011	SEs	
Include the LULUCF sector in its uncertainty analysis, using as far as possible country-specific values, and perform QA/QC sectoral activities (the NIR indicates that some QA/QC activities are conducted by the State Forestry Agency on the AD for forest land during the inventory preparation).	Review 2008	Submission 2010 and 2011	SEs	
Forest land remaining forest land . CO ₂ Provide the information on estimation procedures in more detail and transparently, in the NIR. Make efforts to estimate carbon stock changes in soils and DOM	Review 2008	Submission 2010 and 2011	SEs	
Estimate carbon stock changes derived from afforestation and deforestation activities (e.g. using the land-use change data that were provided to the ERT during the centralized review).	Review 2008	Submission 2010 and 2011	SEs	

Copland remaining cropland . CO2 Prioritize this work and provide revised data and documentation. Make efforts to estimate carbon stock changes in soils	Review 2008	Submission 2010 and 2011	SEs	
Waste				
Provide estimates for the current missing categories for the years where data for estimations are available, correct the use of notation keys, and provide relevant information in documentation boxes of the CRF.	Review 2008	Submission 2010 and 2011	SEs	
Provide and improve the information submitted in the NIR and the CRF tables relating to the changes that result in calculations of the estimates.	Review 2008	Submission 2010 and 2011	SEs	
Provide detailed information on the QA/QC procedures and the determination of uncertainties, including parameters used for the waste sector.	Review 2008	Submission 2010 and 2011	SEs	
Provide and improve the information on the AD and procedures used for the reconstruction of the time series that is used in the application of the FOD method for the calculation of CH4 emissions from this category.	Review 2008	Submission 2010 and 2011	SEs	
From the information provided in the NIR it appears that emissions from unmanaged waste disposal sites were not estimated due to lack of AD. Look for alternatives to estimate and to reconstruct the necessary AD to calculate the emissions of CH4 from this subcategory, and thus to improve the completeness of emission estimates from solid waste disposal on land.	Review 2008	Submission 2010 and 2011	SEs	
the values reported in the CRF for the waste generation rate in the period 1988.1993 are very high (ranging from 2.36 to 2.59 kg/capita/day) compared to the regional values for Eastern European countries and other values provided in the Revised 1996 IPCC Guidelines. Provide a clear justification and sources of information for the used values.	Review 2008	Submission 2010 and 2011	SEs	

<p>Waste composition data are reported as .NA. from 1988 to 1999; values are reported from 2000 to 2006, but these were not used for the determination of degradable organic carbon (DOC) values.</p> <p>Analyse alternatives, including the application of the procedures for reconstruction of time series provided in the IPCC good practice guidance, to improve the available information on waste composition and the determination of DOC values.</p>	Review 2008	Submission 2010 and 2011	SEs	
<p>In the CRF tables the notation key .NO. is reported for OX. During the centralized review, Bulgaria clarified that for calculations it uses .0. for OX and not 0.1 as is used in most industrialized countries. For the case of managed waste disposal sites this depends on the existence of material covering the waste.</p> <p>Correct the value used in its estimations or improve the information provided to justify the OX used.</p>	Review 2008	Submission 2010 and 2011	SEs	
<p>Bulgaria used a MCF of 1 for domestic and commercial wastewater. The first step to determine the weighted MCF is to characterize the wastewater treatment systems in the country. It is fundamental to determine the fractions of collected and uncollected wastewaters and from these, the fractions of treated and untreated (in plants or treated on site) wastewater.</p> <p>Improve and expand the information provided on the wastewater treatment systems and discharge pathways used in the country.</p>	Review 2008	Submission 2010 and 2011	SEs	
<p>Clarify, improve and expand the information provided on the generation of sludge and the disposal practices used in the country.</p>	Review 2008	Submission 2010 and 2011	SEs	
<p>Emissions from waste incineration were reported as .NO. for the entire time series.</p> <p>Make the necessary efforts, to gather or estimate the information and AD needed to calculate and report emissions from this category for the years when the activity occurred in the country. If this is not possible, it recommends the use of the notation key .NE. for this category instead .NO..</p>	Review 2008	Submission 2010 and 2011	SEs	

Annex 40b: Quality Policy

	Quality Management System For Greenhouse Gas Inventories
ИЗПЪЛНИТЕЛНА АГЕНЦИЯ ПО ОКОЛНА СРЕДА Executive Environment Agency (ExEA)	

Quality Policy

The overall responsibility for the establishment and existence of a Quality Management System (QMS) to prepare the inventory of Greenhouse Gases lies with the single national entity Executive Environment Agency (ExEA).

The single national entity aims:

- To comply with applicable legal requirements,
- To improve the quality of the national GHG inventories,
- To ensure focus on fulfillment of the Kyoto protocol and the requirements of the IPCC GPG Chapter 8 QA/QC,
- To ensure the implementation of processes appropriate to enable fulfillment of requirements of the IPCC GPG Chapter 8 QA/QC and of quality objectives,
- To increase awareness, motivation and involvement in GHG inventory work throughout the organization,
- To ensure that an effective and efficient QMS is established, implemented, maintained and reviewed periodically,
- To ensure, within its competences, the availability of necessary resources,
- To decide on actions for improvement of the quality management system.

D. Vergiev
Director



Sofia, November 2009

Kr. Avramova
Deputy Director



personal file	Author: MS Detalina Petrova	13.11.2009	Page 1 of 1
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Annex 41: Order for approval of National CORINAIR methodology

Annex 42: Order for approval of Common National methodology

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