

**Fourth progress report**  
**on the implementation of the Plan of Romania under paragraph 1 of section XV of Decision 27/CMP. 1, in accordance with paragraph 15 in Decision under paragraph 2 of section X concerning the request for reinstatement, decision of the Enforcement Branch of the Compliance Committee (CC-2011-1-15/Romania/EB/13 July 2012)**

**Progresses additional to the implemented measures part of the Third progress report on the implementation of the Plan of Romania under paragraph 1 of section XV of Decision 27/CMP. 1**

Progresses additional to the implemented measures part of the Third progress report on the implementation of the Plan of Romania under paragraph 1 of section XV of Decision 27/CMP. 1 comprise:

- NGHGI related progress

- Tier 2 for Road Transportation category estimates (using the COPERT IV model), based on study 5, have been developed and included in the 2013 NGHGI.

- NS related progresses

- updating the NS as outcome of study 3; results were incorporated in version 2 of 2012 NGHGI;
- updating the informational fluxes related to NGHGI under the study 4; 2013 NGHGI based on elements developed under the study 4 was submitted to the EC and EEA on 15 March 2013;
- implementation of study 6; the results have been incorporated into the 2013 NGHGI.

## Fourth progress report on the implementation of the Plan of Romania under paragraph 1 of section XV of Decision 27/CMP. 1

Table 1: Progress report of Romania under Decision CC-2011-1-15/Romania/EB/13 July 2012)

Description of non-compliance issue		Remedy the non-compliance issue			
Issue, including the reference to relevant requirement(s)	Where described	Measure(s) implemented	Timetable for implemented measure(s)	Control/review of the results	Where described in ARR 2011 (para.)
<b>1. Romania's 2010 annual submission was not sufficiently complete, accurate and transparent, as required by UNFCCC reporting guidelines, IPCC 1996, IPCC GPG 2000, IPCC GPG 2003</b>	ARR 2010, CC-2011-1-8/Romania/EB/27 August 2011				6, 7, 8, 12, 21, 31, 32, 57 (c), 199, 201, 211
<b>1.1 KP Annex A sources</b>					

Description of non-compliance issue		Remedy the non-compliance issue			
Issue, including the reference to relevant requirement(s)	Where described	Measure(s) implemented	Timetable for implemented measure(s)	Control/review of the results	Where described in ARR 2011 (para.)
<p>1.1.1 Accuracy: Tier 1 estimation methods have been exclusively used within the Energy, Agriculture and Waste Sectors; tier 1 method was used to estimate the PFC emissions from Aluminium production (Industrial processes Sector).</p> <p>Decision 19/CMP.1 para. 14 (c), 14 (d) IPCC GPG 2000</p>	<p>ARR 2010, para. 17, 20, 21 (general), para. 58 (Energy), para. 93 (Agriculture), para. 118 (Waste), para 84. (PFC emissions from Aluminium production category-Industrial processes Sector);</p> <p>CC-2011-1-8/Romania/EB/27 August 2011.</p>	<p>Based on NEPA work and on the outcomes of study 1, the following estimates have been developed and included within version 2 of the 2011 NGHGI:</p> <ul style="list-style-type: none"> <li>• Tier 2 CO<sub>2</sub> estimates <ul style="list-style-type: none"> <li>○ Public electricity and heat production,</li> <li>○ Manufacturing industries and constructions,</li> <li>○ Other sectors and</li> <li>○ Road transport (based on the COPERT III model use) categories (Energy);</li> </ul> </li> <li>• Tier 3 CO<sub>2</sub> estimates and Tier 2 PFC estimates associated to the Aluminium production category (Industrial processes);</li> <li>• Tier 2 estimates for Managed waste disposal on land category (Waste).</li> </ul>	<p>Version 2 of 2011 NGHGI was submitted to the UNFCCC Secretariat on 11 August 2011</p>	<p>QC performed by the contractor (study 1)</p> <p>QA ensured on behalf of the contractor (study 1)</p> <p>QC/peer review ensured by NEPA dedicated team for own results/study 1 results</p> <p>2011 in-country review/"Saturday paper" and ARR 2011</p>	<p>7, 12, 26, 31, 32, 44, 57 (a), 63 (a, b), 76, 79, 90 (a), 103, 151 (a), 157, 199, 211</p>

Description of non-compliance issue		Remedy the non-compliance issue			
Issue, including the reference to relevant requirement(s)	Where described	Measure(s) implemented	Timetable for implemented measure(s)	Control/review of the results	Where described in ARR 2011 (para.)
		<p>Based on outcomes of study 1, the following estimates have been developed and included within 2012 NGHGI:</p> <ul style="list-style-type: none"> <li>• Tier 2<sup>1</sup> in majority/Tier 1<sup>2</sup> estimates, for 1989-2010 period, for CO<sub>2</sub> emissions, and Tier 1<sup>3</sup> for CH<sub>4</sub> and N<sub>2</sub>O emissions, for Public electricity and heat production, Manufacturing industries and construction, Other sectors (Energy);</li> <li>• Tier 1a estimates for Ammonia production (Industrial processes);</li> <li>• Tier 2/Tier 1<sup>4</sup>/default method<sup>5</sup>/Tier 1b with national/default<sup>6</sup> parameter values estimates for Enteric fermentation, Manure management and Agricultural soils (Agriculture);</li> <li>• Tier 2 estimates for CH<sub>4</sub> emissions and CO<sub>2</sub> estimates using the default<sup>7</sup> method and national emission factors, for Solid waste disposal on land, and CH<sub>4</sub> and N<sub>2</sub>O emissions estimates using the default method<sup>8</sup> and national/default<sup>9</sup> emission factors, for Wastewater treatment (Waste).</li> </ul>	The 2012 NGHGI was submitted to the EC and EEA on 15 January 2012.	2012/2013 review/"Saturday paper" and ARR 2012/2013	23, 26, 29, 32, 113, 116, 118, 199

<sup>1</sup> Considering the results of study 1 and further NEPA work, for some categories, best practices to incorporate into NGHGI Tier 3 estimates are further analyzed.

<sup>2</sup> Considering the results of study 1, Tier 1 estimates are associated to some fuels: crude oil, LPG (relevant to EU-ETS), kerosene type jet fuel, other product, liquid natural gas, naphta, other kerosene, white spirit and SB/SBP, anthracite, subbituminous coal, coking coal, patent fuel, BKB/PB, coke oven gas, blast furnace gas (relevant to EU-ETS), peat, whose contribution within emissions level is relatively small. For EU-ETS relevant fuels, the amount consumed is very small, the operators being permitted to use default EFs; for all fuels, development through national specific determinations is to be considered.

<sup>3</sup> Tier 1a as specified within the First progress report has been replaced with Tier 1, solving an identified error.

Following the conclusions raised by study 1, Tier 2 emissions estimates development through national specific determinations is to be considered.

<sup>4</sup> Tier 1a as specified within the First progress report has been replaced with Tier 1, solving an identified error.

<sup>5</sup> Comparing with the First progress report, the default method has been considered, solving an identified error.

<sup>6</sup> Considering the results of study 1, in some cases, due to the lack of data, national parameter values could not be used.

<sup>7</sup> Comparing with the First progress report, the default method has been considered, solving an identified error.

<sup>8</sup> Comparing with the First progress report, the default method has been considered, solving an identified error.

<sup>9</sup> Following the conclusions of study 1, national parameter values development through specific determinations is to be considered.

Description of non-compliance issue		Remedy the non-compliance issue			
Issue, including the reference to relevant requirement(s)	Where described	Measure(s) implemented	Timetable for implemented measure(s)	Control/review of the results	Where described in ARR 2011 (para.)
		<p>Tier 2<sup>10</sup> for Road Transportation category estimates (using the COPERT IV model), based on <b>study 5</b><sup>11</sup>, have been developed and included in the 2013 NGHGI.</p> <p>Tier 2 in majority/Tier 1<sup>12</sup> CO<sub>2</sub> emissions estimates and Tier 1<sup>13</sup> CH<sub>4</sub> and N<sub>2</sub>O emissions estimates, for Railways and Navigation categories (Energy), based on NEPA work and on study 1, have been developed and included in 2012 NGHGI.</p>	<p>The 2013 NGHGI has been submitted to the EC and EEA on 15 January 2013.</p> <p>The 2012 NGHGI has been submitted to the EC and EEA on 15 January 2012.</p>	2012/2013 review/"Saturday paper" and ARR 2012/2013	26, 29, 32, 199
1.1.2 Completeness: categories whose associated emissions are not estimated when relevant methodologies exists (NEs) can be found on an important scale					7, 12, 21, 24, 32, 209

<sup>10</sup> Due to availability of activity data, Tier 2 estimates have been developed for 2005-2011 period; the preparation of Tier 2 estimates for the 1989-2004 period is further analyzed.

<sup>11</sup> The study 5 related activities have been implemented based on the Protocol of collaboration no. 3136/MMP/9.07.2012 between Ministry of Environment and Forests, NEPA, Romanian Automobile Register and Directorate on Driving Licenses and Vehicles Registration in the Ministry of Administration and Interior.

<sup>12</sup> Based on the results of study 1, Tier 1 estimates are associated for the 1992-2009 period and for Railways category, to solid biomass-wood, and for 1993-2008 period and Navigation category, to other fuels-lubricants; the contribution within associated emissions level is relatively small (the amount consumed is relatively small), while development through national specific determinations is to be considered.

<sup>13</sup> Following the conclusions of study 1, Tier 2 emissions estimates development through national specific determinations is to be considered.

Description of non-compliance issue		Remedy the non-compliance issue			
Issue, including the reference to relevant requirement(s)	Where described	Measure(s) implemented	Timetable for implemented measure(s)	Control/review of the results	Where described in ARR 2011 (para.)
<p>Energy sector (including adjustment for venting and flaring in oil production)</p> <p>IPCC 1996 Decision 20/CMP.1 (Guidance on methodologies for adjustment)</p>	<p>ARR 2010, para. 10-11</p> <p>ARR 2010, para. 132-140 (adjustment)</p>	<p>For the first time, emissions in Oil production, Oil transport, Natural gas production/processing and Natural gas transmission categories of the Fugitive emissions subsector have been estimated; the estimates have been incorporated into version 1 of the 2011 NGHGI.</p> <p>Compared to version 3.2 of the 2010 NGHGI, the characterization of NEs has been improved further in the first version of the 2011 NGHGI based on NEPA work. The number of NEs decreased by 24 for the last characterized year (2008, associated to the version 3.2 of the 2010 NGHGI and, respectively, 2009, associated to the version 1 of the 2011 NGHGI), from 88 to 64.</p>	<p>Version 1 of 2011 NGHGI was submitted to the UNFCCC Secretariat on 15 April 2011.</p>	<p>QC performed by NEPA</p> <p>QA under the EU-Monitoring Mechanism (EU-MM)</p> <p>2011 in-country review/"Saturday paper" and ARR 2011</p>	<p>63 (c)</p> <p>32, 44, 64, 81, 82, 83</p>
		<p>Compared to version 1 of the 2011 NGHGI, the characterization of NEs has been improved further in version 2 of the 2011 NGHGI, based on the work of NEPA; the number of NEs decreased by 20 for 2009 year, from 64 to 44.</p>	<p>Version 2 of 2011 NGHGI was submitted to the UNFCCC Secretariat on 11 August 2011.</p>		
		<p>Compared to version 2 of the 2011 NGHGI, the characterization of NEs has been further improved in the 2012 NGHGI, based on NEPA work; the number of NEs decreased with 38 for the last characterized year (2009, associated to the version 2 of the 2011 NGHGI and, respectively, 2010, associated to the 2012 NGHGI), from 44 to 6.</p>	<p>The 2012 NGHGI was submitted to the EC and EEA on 15 January 2012.</p>	<p>2012 review/"Saturday paper" and ARR 2012</p>	

Description of non-compliance issue		Remedy the non-compliance issue			
Issue, including the reference to relevant requirement(s)	Where described	Measure(s) implemented	Timetable for implemented measure(s)	Control/review of the results	Where described in ARR 2011 (para.)
Industrial Process  IPCC 1996, IPCC GPG 2000	ARR 2010, para. 10	<p>Compared to version 3.2 of the 2010 NGHGI, based on NEPA work, the characterization of NEs was further improved in the first version of the 2011 NGHGI; the number of NEs decreased by 45 for the last characterized year (2008, associated to the version 3.2 of the 2010 NGHGI and, 2009, associated to the version 1 of the 2011 NGHGI), from 81 to 36.</p> <p>Analysis of improvements in the characterization of NEs within the 2012 NGHGI, compared to the first version of the 2011 NGHGI. As a result the number of NEs for the last characterized year (2009, associated to the first version of the 2011 NGHGI and, 2010, associated to the 2012 NGHGI), remained constant<sup>14</sup>.</p>	<p>Version 1 of 2011 NGHGI was submitted to the UNFCCC Secretariat on 15 April 2011</p> <p>The 2012 NGHGI was submitted to the EC and EEA on 15 January 2012.</p>	<p>QC performed by NEPA;</p> <p>QA under the EU-MM</p> <p>2011 in-country review/"Saturday paper" and ARR 2011</p> <p>2012/2013 review/"Saturday paper" and ARR 2012/2013</p>	32, 44, 94

<sup>14</sup> Out of 36 NEs, 33 are represented by categories for which no default estimation method/EF are available, their characterization not being mandatory. Data to support the characterization of the remaining categories were not available; further collection of data implemented in 2012, determined a constant number of NEs in 2013 NGHGI, comparing with the 2012 NGHGI.

Description of non-compliance issue		Remedy the non-compliance issue			
Issue, including the reference to relevant requirement(s)	Where described	Measure(s) implemented	Timetable for implemented measure(s)	Control/review of the results	Where described in ARR 2011 (para.)
1.1.3 Transparency					12, 32, 52, 53
Energy sector: sub-categories less detailed than, and inconsistent with, energy balance  IPCC GPG 2000	ARR 2010, para. 57, 71	The transparency of reporting on the Energy Sector has been improved, including through the extended use of detailed data in the Energy Balance and through the inclusion in the NIR <sup>15</sup> of the disaggregated data on transport and on other fuels and other petroleum oil, data provided by the National Institute for Statistics.	2012 NGHGI was submitted to the EC and EEA on 15 January 2012.	QC performed by NEPA  QA under EU-MM  2012 review/ "Saturday paper" and ARR 2012	75, 86
Industrial Processes: trend explanation missing  IPCC GPG 2000	ARR 2010, para. 77, 83	The emissions and emission factors trend explanations was improved in the NIR through the provision of more detailed elements , as part of the version 3 of NGHGI 2011.	Version 3 of the 2011 NGHGI was submitted to the UNFCCC Secretariat on 15 September 2011	QC performed by NEPA  2011 in-country review/"Saturday paper" and ARR 2011	32, 52, 53, 95
Agriculture: trend explanation missing  IPCC GPG 2000	ARR 2010, para. 90	The activity data trend explanation was improved in the NIR through the provision of more detailed elements, as part of the version 3 of NGHGI 2011.	Version 3 of the 2011 NGHGI was submitted to the UNFCCC Secretariat on 15 September 2011	QC performed by NEPA  2011 in-country review/"Saturday paper" and ARR 2011	32, 52, 53

<sup>15</sup> All transport data have been used in estimating the emissions and are subject to several NIR associated reports.



Description of non-compliance issue		Remedy the non-compliance issue			
Issue, including the reference to relevant requirement(s)	Where described	Measure(s) implemented	Timetable for implemented measure(s)	Control/review of the results	Where described in ARR 2011 (para.)
Agriculture: justification missing for selection of default EFs for developing countries  IPCC GPG 2000	ARR 2010, para. 98, 101	The documentation of EFs was improved within the NIR through the provision of more detailed elements, part of the version 3 of the NGHGI 2011.	Version 3 of the 2011 NGHGI was submitted to the UNFCCC Secretariat on 15 September 2011	QC performed by NEPA  2011 in-country review/"Saturday paper" and ARR 2011	32, 52, 53
Waste: explanation of trends  IPCC GPG 2000	ARR 2010, para. 119, 125	Improving the documentation of parameters, their yearly variation and foreseen improvements, within the NIR <sup>16</sup> , through the provision of more detailed elements.	2012 NGHGI was submitted to the EC and EEA on 15 January 2012.	QC performed by NEPA  QA under EU-MM  2012 review/"Saturday paper" and ARR 2012	
<b>2. The NS of Romania did not perform some of the specific functions required by the guidelines for NS</b>	ARR 2010, CC-2011-1-8/Romania/EB/27 August 2011				12, 23, 31, 32, 57 (c, d), 199, 200, 201, 202, 216

<sup>16</sup> All improved documentations are part of the 2012 NGHGI submitted on 15 January 2012.

Description of non-compliance issue		Remedy the non-compliance issue			
Issue, including the reference to relevant requirement(s)	Where described	Measure(s) implemented	Timetable for implemented measure(s)	Control/review of the results	Where described in ARR 2011 (para.)
<p>Institutional arrangements: failure to collect required data</p> <p>Decision 19/CMP.1 para. 14 (c)</p>	ARR 2010, para. 27, 178, 185	<p>The following progresses have been achieved in updating the NEPA NS/NGHGI dedicated Structure as follows:</p> <ul style="list-style-type: none"> <li>- governmental approval during June-July 2011 for establishing a new unit at NEPA dedicated specifically to the administration of NS and the NGHGI and allowing for an increase in staff, from 5 to 16;</li> <li>- employment an additional 11 people<sup>17</sup>. The allocation of attributions/responsibilities across the whole team to date and respectively, before September 2011, and the expertise of new staff are presented in Tables 3.1, 3.2 and 3.3;</li> <li>- ensuring appropriate working space and facilities;</li> <li>- ensuring the necessary IT equipment through the support of <b>study 4</b>;</li> </ul>	<p>Governmental approval: June-July 2011.</p> <p>Employment of additional staff: August 2011.</p> <p>Ensuring appropriate working conditions and IT equipment: August 2011.</p>	<p>MEF and NEPA administrate the update of the NEPA NS/NGHGI dedicated Structure</p> <p>Peer review of study 4 results was implemented by NEPA</p> <p>2011 in-country review/"Saturday paper" and ARR 2011</p>	8, 12, 23, 30, 31, 32, 57 (c, d), 200

<sup>17</sup> The stability of the team is ensured through the stability of the structure, part of a public institution, NEPA, and also by ensuring on a permanent basis the financial resources for the dedicated team. The experts are civil servants being employed on a permanent basis.

Description of non-compliance issue		Remedy the non-compliance issue			
Issue, including the reference to relevant requirement(s)	Where described	Measure(s) implemented	Timetable for implemented measure(s)	Control/review of the results	Where described in ARR 2011 (para.)
		<p>- adequate training of all staff using the UNFCCC Secretariat and GHG management reviewer training courses, under the <b>study 3</b> and based on the collaboration with EEA and European Topic Centre for Air pollution and Climate change Mitigation; training was based on the Schedule for training of new staff part of the NEPA team dedicated to the administration of the NS and the NGHGI, respectively (Table 4).</p> <p>In addition to the planned measures, the NEPA personnel administrating the NGHGI Energy Sector received technical assistance from the Environment Agency of Austria; the results were incorporated in the NGHGI 2012.</p> <p>Updating the NS as outcome of <b>study 3</b>; results were incorporated in version 2 of 2012 NGHGI.</p> <p>Updating the informational fluxes related to NGHGI under the <b>study 4</b>; the results are incorporated in the 2013 NGHGI.</p>	<p>Training the NEPA NS/NGHGI dedicated staff: 3 October<sup>18</sup>-31 December 2011.</p> <p>Technical assistance provided by the Environment Agency of Austria: 14 November-31 December 2011; 2012 NGHGI has been submitted to the EC and EEA on 15 January 2012.</p> <p>Updating the NS as outcome of <b>study 3</b>: version 2 of 2012 NGHGI was submitted to the UNFCCC Secretariat, EC and EEA on 10 August 2012.</p> <p>Updating the informational fluxes related to NGHGI; 2013 NGHGI was submitted to the EC and EEA on 15 March 2013.</p>	2012/2013 review/"Saturday paper" and ARR 2012/2013	<p>30, 31, 32, 57 (c, d)</p> <p>17, 32, 57 (c, d)</p>

<sup>18</sup> Please note that compared with the First progress report, the deadline "September-October 2011" was clarified to "3 October".

Description of non-compliance issue		Remedy the non-compliance issue			
Issue, including the reference to relevant requirement(s)	Where described	Measure(s) implemented	Timetable for implemented measure(s)	Control/review of the results	Where described in ARR 2011 (para.)
Inventory preparation: failure to ensure that appropriate methods are used for key categories  Decision 19/CMP.1 para. 14 (b)	ARR 2010, para. 27, 178, 185	Please consider the elements under item 1.1.1			7, 12, 23, 26, 28, 29, 31, 32, 44, 57 (a, c, d), 63, 76, 79, 90 (a), 103, 151 (a), 157, 186, 199, 201, 202, 211, 216
Inventory preparation: lack of accuracy (as a consequence of above)	ARR 2010, para. 187	Please consider the elements under item 1.1.1			7, 12, 23, 26, 28, 29, 31, 32, 44, 57 (a, c, d), 63, 76, 79, 90 (a), 103, 151 (a), 157, 186, 199-202, 211, 216
Inventory preparation: improvements based on previous plans and ERT recommendations are mostly not implemented	ARR 2010, para. 50, 53, 190	Please consider the elements under items 1.1.1-1.1.3.			7, 12, 23, 26, 28, 29, 32, 38, 44, 45, 47, 57 (b, c, d), 63, 76, 79, 90 (a), 95, 103, 116, 118, 151 (a), 157, 168, 173, 185, 199, 201, 202, 211, 212, 214, 216
Adequacy of funding to improve the national system through the planned studies is unclear to ERT	ARR 2010, para. 31, 50, 191	The presentation of funding dedicated to improvement of the NS has been improved within the NIR through the provision of more detailed elements, part of the version 3 of the 2011 NGHGI.	Version 3 of the 2011 NGHGI was submitted to the UNFCCC Secretariat on 15 September 2011.	2011 in-country review/"Saturday paper" and ARR 2011	12, 17, 23, 29, 32, 57 (c, d), 199, 201, 216

Description of non-compliance issue		Remedy the non-compliance issue			
Issue, including the reference to relevant requirement(s)	Where described	Measure(s) implemented	Timetable for implemented measure(s)	Control/review of the results	Where described in ARR 2011 (para.)
The Party did not indicate any specific changes to the NS that are likely to ensure its proper functioning in the near future	ARR 2010, para. 190	The presentation of changes to the NS made to ensure its proper functioning in the future was improved in version 3 of the 2011 NGHGI through the provision of more detailed elements.	Version 3 of the 2011 NGHGI was submitted to the UNFCCC Secretariat on 15 September 2011.	2011 in-country review/"Saturday paper" and ARR 2011	12, 23, 29, 31, 32, 57 (c, d), 198, 199, 201, 202, 216
Preparation of the KP-LULUCF information/data-accuracy: a Tier 1 method was used to estimate the emissions/removals associated to the Forest Management activity, a key category  IPCC GPG 2003 Decision 19/CMP. 1 para. 14 (f)	ARR 2010, para. 21, 27 (general), para. 153 (info under KP), para. 186 (QI)	Development of Tier 2 estimates <sup>19</sup> for the Forest Management activity, based on <b>study 2</b> ; estimates have been incorporated in version 3 of the NGHGI 2011. The elaboration of Tier 2 estimates has been supported by an improved land use change matrix (improving also the consistency between the UNFCCC and KP estimates) developed within the <b>study 2</b> <sup>20</sup> and by improved quality management performed by the <b>study 2</b> contractor and NEPA.  Implementation of study 6; the results have been incorporated into the 2013 NGHGI.	Version 3 of the 2011 NGHGI was submitted to the UNFCCC Secretariat on 15 September 2011  2013 NGHGI was submitted to EC and EEA on 15 January 2013.	QC ensured by the contractor of studies 2 and 6  Peer review of the studies 2 and 6 results ensured by NEPA  2011 in-country review/"Saturday paper", ARR 2011  2013/2014 review/"Saturday paper" and ARR 2013/2014	23, 28, 29, 32, 34, 44, 57 (a, e), 132, 135, 172, 176, 186, 199, 213  199, 201, 211

<sup>19</sup> Considering the results of study 2, Tier 2 estimates associated to the litter, dead wood and soil pools were subject of development within study 6, based also on progress achieved in the elaboration of the new National Forest Inventory:

- DW, LT-the preparation of Tier 3 estimates has begun; the results will be available by the end of 2013, and will be incorporated in the 2014 NGHGI;
- SOC-mineral soils- the preparation of Tier2/Tier 3 estimates has begun; the results will be available by end of 2013, and will be incorporated in the 2014 NGHGI;
- SOC-organic soils- the preparation of Tier 2 estimates has begun; the results will be available by the end of 2013 and will be incorporated in the 2014 NGHGI.

<sup>20</sup> The progresses achieved following the implementation of study 2 are presented in Table 5.

Description of non-compliance issue		Remedy the non-compliance issue			
Issue, including the reference to relevant requirement(s)	Where described	Measure(s) implemented	Timetable for implemented measure(s)	Control/review of the results	Where described in ARR 2011 (para.)
Preparation of the KP-LULUCF information/data-completeness: not all C pools are estimated while no demonstration that these pools are not net sources is available  IPCC GPG 2003 Decision 19/CMP. 1 para. 14 (f) Decision 15/CMP.1 (para. 6 (e) to Annex) Decision 16/CMP. 1 (para. 21)	ARR 2010, para. 21, 27 (general), para. 142 (info under KP), para. 186 (QI)	Tier 1 estimates/elements to demonstrate that the pools are not net sources, elements associated to the carbon stock in litter and dead wood pools for Forest Management activity, and in mineral soils pool for Revegetation activity, based on <b>study 2</b> , were developed and incorporated in version 4 of the 2011 NGHGI <sup>21</sup> .  Updating the NEPA NS/NGHGI dedicated structure according to the elements within first item in point 2.	Version 4 of the 2011 NGHGI was submitted to the UNFCCC Secretariat and to ERT on 14 November 2011  Updating the NEPA NS/NGHGI dedicated structure according to the first item in point 2.	2011 in-country review/"Saturday paper" and ARR 2011  2012 review/"Saturday paper" and ARR 2012  MEF and NEPA administrated the update of the NEPA NS/NGHGI dedicated structure	21, 23, 24, 28, 29, 32, 34, 44, 57 (e), 169, 173, 185, 190, 199, 209, 213  Please consider the elements within first item in point 2.

<sup>21</sup> Version 4 of the 2011 NGHGI comprises all elements of the responses provided to the potential problems the ERT has listed in the "Saturday paper" following the 2011 in-country review.

Description of non-compliance issue		Remedy the non-compliance issue			
Issue, including the reference to relevant requirement(s)	Where described	Measure(s) implemented	Timetable for implemented measure(s)	Control/review of the results	Where described in ARR 2011 (para.)
Preparation of the KP-LULUCF information/data-transparency: the associated information/data presented are insufficient  IPCC GPG 2003 Decision 19/CMP. 1 para. 14 (f)	ARR 2010, para. 144, 145 (Forest Management and Revegetation), para. 150 (Afforestation)	The transparency of the KP-LULUCF related information/data has been improved in the NIR, part of the version 3 of the 2011 NGHGI, through the provision of more detailed elements, based on the <b>study 2</b> .	Version 3 of the 2011 NGHGI was submitted to the UNFCCC Secretariat on 15 September 2011	QC ensured by the contractor of study 2  Peer review of the study 2 results ensured by NEPA  2011 in-country review/"Saturday paper" and ARR 2011	23, 32, 34, 52, 53, 57 (e), 199, 213

**Table 2: Studies addressing the unconformities in ARR 2010**

No.	Study title	Objectives	Contractor	Status of implementation	Deadline final results
1.	“Elaboration/documentation of national emission factors/other parameters relevant to NGHGI Sectors Energy, Industrial Processes, Agriculture and Waste, values to allow for the higher Tier calculation methods implementation”	Improving the accuracy in key categories estimates, as presented in Table 1.	SC ISPE (Institute for Studies and Power Engineering) SA	Finalized	31 October 2011
2.	“NGHGI LULUCF both under the UNFCCC and KP obligations”	Improving the accuracy, completeness, consistency and transparency of the LULUCF Sector	ICAS Bucharest	Finalized	31 October 2011
3.	“Support for the implementation of the European Union requirements on the monitoring and reporting of the carbon dioxide (CO <sub>2</sub> ) and other greenhouse gas emissions”	Strengthening the NS, including in respect to data collection	SC ISPE SA	Finalized	30 November 2011
4.	“Environmental Integrated Informational System”	Optimizing the informational fluxes related to the NGHGI, including: - data collection from the operators for the Electricity and heat production category (Energy); - data collection from public authorities.	SC Asesoft International SA-SC TeamNet International SA-SC Star Storage SRL consortium	Finalized	31 December 2012 <sup>22</sup>
5.	“Development of historical data, for the period 1989-2010, for allowing to estimate direct and indirect GHG emissions from Road Transport using the COPERT 4 model associated to the Tier 2 approach” <sup>23</sup>	Increasing the accuracy of the Road transport estimates, using the COPERT 4 model	RAR and DRPCIV	Finalized	31 October 2012
6.	“NGHGI LULUCF both under the UNFCCC and KP obligations” <sup>24</sup>	Improving the accuracy, completeness, consistency and transparency of the LULUCF Sector	ICAS Bucharest	Finalized	31 December 2012 <sup>25</sup>

<sup>22</sup> Please note that compared with the Third progress report, the deadline “September 2012” was clarified to “31 December 2012”.

<sup>23</sup> The study 5 related activities have been implemented based on the Protocol of collaboration no. 3136/MMP/9.07.2012 between Ministry of Environment and Forests, NEPA, Romanian Automobile Register and Directorate on Driving Licenses and Vehicles Registration in the Ministry of Administration and Interior (relevant for an undetermined period).

<sup>24</sup> The study 6 related activities have been implemented through the implementation of the studies “Determination of emission/removal factors for the forest and for conversions from/to forest land associated pools both under UNFCCC and KP obligations” and “Compilation of the 2013 National Greenhouse Gas Inventory Land Use, Land-Use Change and Forestry Sector both under the UNFCCC and KP obligations” and of the Protocol of collaboration no. 3029/MMP-RP/3.07.2012 between Ministry of Environment and Forests, NEPA and ICAS Bucharest (relevant for 2012-2014 period).

<sup>25</sup> Based on the results of the study in 2012, new procurement is considered for 2013.

Please note that compared with the First progress report, the deadline “31 October 2012” was clarified to “31 December 2012”.



**Table 3.1: Allocation of attributions/responsibilities to the team dedicated to the administration of the NS/NGHGI, as of September 2011**

<b>16 staff part of the NS (SNEEGES) Service (part of the Climate Change, Sustainable Development Directorate), unit responsible with NS/NGHGI administration</b>			
<b>Team size (staff)</b>	<b>Responsibilities</b>	<b>Name and e-mail address of the civil servant</b>	<b>Allocation of responsibilities to new staff, as of</b>
4	Administration of Energy Sector, including the Transport Subsector; implementing relevant sectoral activities associated to: key category analysis, uncertainty analysis, QA/QC, data/information archiving; implementing all relevant sectoral activities.	Cristina Djano, cristina.djano@anpm.ro Gherghița Nicodim, geta.nicodim@anpm.ro Pompilia State, pompilia.state@anpm.ro Evelina Dascălu, evelina.dascalu@anpm.ro	September 2011
3	Administration of Industrial Processes and Solvents and Other Product Use Sectors; implementing all relevant sectoral activities.	Mihaela Smarandache, mihaela.smarandache@anpm.ro Maria Letiția Stanciu, letitia.stanciu@anpm.ro Adarciza Brulea, adarciza.brulea@anpm.ro	September 2011
2	Administration of Agriculture Sector; implementing all relevant sectoral activities.	Luminița Olteanu, luminita.olteanu@anpm.ro Corina Stanciu, corina.stanciu@anpm.ro	September 2011
3	Administration of LULUCF Sector; implementing all relevant sectoral activities.	Izabela Franga, isabela.franga@anpm.ro Cătălin Dulgheru, catalin.dulgheru@anpm.ro Cătălina Chivu, catalina.chivu@anpm.ro	September 2011
2	Administration of Waste Sector; implementing all relevant sectoral activities.	Ramona Niculescu, ramona.niculescu@anpm.ro Brîndușa Paciurea, brindusa.paciurea@anpm.ro	September 2011
1	Administration of the key category <sup>26</sup> and uncertainty analysis data/information associated to the NGHGI.	Adrian Cioroiu, adrian.cioroiu@anpm.ro	September 2011
1	Coordinating the team/activities relevant to the NIS/NGHGI administration; coordinating the QA/QC activities; manager of the archiving system.	Sorin Deaconu, sorin.deaconu@anpm.ro	September 2011

<sup>26</sup> Comparing with the Second progress report, the key category analysis has been considered, solving an identified error.

**Table 3.2: Allocation of attributions/responsibilities to the team dedicated to the administration of the NS/NGHGI before September 2011**

<b>5 staff part of the Climate Change Service (part of the Climate Change, Sustainable Development Directorate), unit responsible with the administration of several Climate Change related instruments (EU-ETS, NS/NGHGI, GHG Emissions National Registry, other Climate Change related instruments)</b>			
<b>Team size (staff)</b>	<b>Responsibilities</b>	<b>Name civil servant</b>	<b>Allocation of responsibilities, as of<sup>27</sup></b>
1	Administration of Energy Sector, including the Transport Subsector; implementing relevant sectoral activities associated to: key category analysis, uncertainty analysis, QA/QC, data/information archiving; implementing all relevant sectoral activities.	Cristina Djano	January 2009
1	Administration of Industrial Processes and Solvents and Other Product Use Sectors; implementing all relevant sectoral activities.	Mihaela Smarandache	September 2006
1	Administration of LULUCF Sector; implementing all relevant sectoral activities.	Izabela Franga	February 2010
1	Administration of Waste Sector, including the implementation of all relevant sectoral activities; administration of the NGHGI key category analysis related data/information.	Ramona Niculescu	August 2011
1	Coordinating the team/activities relevant to the NIS/NGHGI administration; coordinating the QA/QC activities; manager of the archiving system; administration of the uncertainty analysis data/information associated to the NGHGI; administration of Agriculture Sector, including the implementation of all relevant sectoral activities.	Sorin Deaconu	September 2006

<sup>27</sup> Additional to those specified below, please consider that:

- the NEPA Climate Change, Sustainable Development Directorate had the attributions/responsibilities of administrating the NS/NGHGI beginning with September 2006;
- personnel joining the NEPA NS/NGHGI dedicated team after September 2006 and before September 2011 was trained also by colleagues currently/previous part of the team since September 2006.

**Table 3.3: Expertise of new staff employed by NEPA as civil servants, part of the team dedicated to the administration of the NS/NGHI, as of September 2011**

No.	Name	Expertise
1.	Gherghița Nicodim	Licensed in Energetic Engineering, Industrial Energetic Specialization, extended working experience in research (as scientific researcher) and development of electronic products, significant experience in international projects
2.	Pompilia State	Licensed in Engineering, Hydro-technical Construction Specialization, extended working expertise as scientific researcher in environment protection and water management, significant experience in international projects
3.	Evelina Dascălu	Licensed in Engineering, Technology and Metallurgy field, Master's degree in Public Administration and European Integration, significant working experience in public administration
4.	Maria Letiția Stanciu	Licensed in Physical Chemistry, Physics field, Master's degree in Crystalline Materials Physics, Postgraduate degree in Informatics, work experience in public educational system
5.	Adarciza Brulea	Licensed in Chemistry, Physical Chemistry Specialisation, significant working experience as researcher/chemist within the environmental protection field
6.	Luminița Olteanu	Licensed in Agriculture, Master's degree in Intensive environmentally friendly technologies for field crops, Doctor in Agriculture, Phytotechnic Specialization, significant working experience within environmental protection as part of public administration, working experience as agricultural engineer
7.	Corina Stanciu	Licensed in Agriculture, Master's degree in Integrated processing and agro-food additive, Postgraduate degree in Informatics, work experience in education field
8.	Cătălin Dulgheru	Licensed in Engineering, Horticulture Specialization, Master's degree in Integrated Horticultural Technologies, significant working experience within the public administration dealing with environment protection issues, working experience as horticultural engineer
9.	Cătălina Chivu	Licensed in Public Management, Master's degree in Public Administration and European Integration, significant working experience in the public administration dealing with environment protection issues, as well as in database management
10.	Brîndușa Paciurea	Licensed in Environmental Engineering, expertise in developing databases
11.	Adrian Cioroiu	Licensed as Mechanical Engineer, Mechanical Engineering - Welding Equipment and Technology Speciality, extended experience as engineer

**Table 4: Schedule of training of new staff part of the NEPA team dedicated to the administration of the NS and NGHGI, as of September 2011-May 2012**

No.	Activity	Period/Deadline	Persons subject to training	Responsible persons	Documents to be considered
1.	Improving the technical knowledge based on international and national documents related to the National System for Estimating the Greenhouse Gas Emissions/Removals (NS) and the Greenhouse Gas Inventory (NGHGI)	1 September 2011-10 March 2012	All new Sectoral Experts (SEs)	GHG Inventory coordinator	Governmental Decision (GD) no. 1570/2007, Ministry of Environment Order (MoEO) no. 1376/2008 for approving the Procedure on NGHGI reporting and the modality for answering to the observations and questions raised following the NGHGI review; MoEO no. 1474/2008 for approving the Procedure on processing, archiving and storage of data specific to the NGHGI; NEPA's President Decision no. 23/2009 for approving the Procedure on selection of the estimation methods and of the emission factors needed for the estimation of the GHG levels; NEPA's President Decision no. 24/2009 for approving the QA/QC Procedure related to the NGHGI, National Inventory Report-Romanian version-NGHGI 2009, NGHGI 2011, 2010, 2009, Updated UNFCCC reporting guidelines on annual inventories following incorporation of the provisions of decision 14/CP.11 (UNFCCC Reporting Guidelines), IPCC good practice guidance (IPCC GPG 2000), IPCC good practice guidance for LULUCF (IPCC GPG 2003), IPCC 1996
2.	Training in the context of the study "Support for the implementation of the European Union requirements on the monitoring and reporting of the carbon dioxide (CO <sub>2</sub> ) and other greenhouse gas emissions"	31 October 2011	All new SEs	GHG Inventory coordinator	

3.	On-line UNFCCC Secretariat and GHG Management Institute reviewer training courses	3 October-31 December 2011	All new SEs	GHG Inventory coordinator	UNFCCC Secretariat and GHG Management Institute on-line training courses, IPCC GPG 2000, IPCC GPG 2003, IPCC 1996
4.	Training provided by the - EEA and European Topic Centre for Air pollution and Climate change Mitigation in respect to Energy, Industrial processes, Solvents and other product use and Waste NGHGI Sectors; - EC-Joint Research Centre, in respect to the Agriculture and Land Use, Land Use Change and Forestry (LULUCF) Sectors	15 October-31 December 2011	All new SEs	GHG Inventory coordinator	IPCC GPG 2000, IPCC GPG 2003, IPCC 1996
5.	Implementing together with the more senior staff, based on a sectoral approach, all activities pertaining to the NS and NGHGI administration, including the activities related to NGHGI preparation plan and NGHGI improvement plan <sup>28</sup>	1 September 2011-10 May 2012	All new SEs	GHG Inventory coordinator, QA/QC coordinator, older SEs	All documents at point 1, as well as other relevant documents

<sup>28</sup> The activity was gradually implemented starting with 1 September 2011.

**Table 5: Progresses achieved following the implementation of study 2 compared to 2010 NGHGI**

<b>Forest representation</b>	With the resubmission of the 2009 NGHGI in 2011 a consistent land use change matrix for 1989-2010 was developed. This resulted in reporting of all land use sub-categories, with a 20 years transition period for lands under various conversions. The land matrix relies on national land statistics and other sources of information that allow consistent time series of activity data for all land categories while also meeting identification and traceability requirements for reporting Kyoto activities.
<b>5A1 – Forest Land remaining Forest Land</b>	Activity data results from the land matrix. In line with the national legislation, the area reported under 5A1 consists of the National Forest Fund (NFF) and at the request expressed during the 2011 review, also the area of Forest Vegetation Outside the Forest Fund (VFAFF), which, according the national land law, falls outside grasslands and farmland. For this land category the land is represented according to Approach 2 of the IPCC.
	For C stock change in Living biomass, the default (i.e. gain-loss) method is used with country specific data, involving growth data computed from annual increment from the 1985 forest inventory. Losses are computed from national annual harvest statistics. The previous overestimation of annual removal figures because of incorrect use of BEF was corrected. BEF was actually excluded from the calculation of the annual growth of all tree species, because Romania's yield table includes the whole standing volume, stem and branches respectively, and this applies to the annual increment as well. This correction generated a reduction of the previously computed annual sink by approximately 25 %. Nevertheless, the recalculation has no impact on the trend. A second correction was made by removing from the calculation of the loss in living biomass the previously used parameter of the "fraction of biomass residues", as annual harvest of wood reported by national statistics includes the entire standing wood volume. The effect of this correction led to an additional decrease of the previously computed sink by some 10%. This recalculation also had no impact on the trend. Values of root-to-shoot factor (R) were reduced compared to the IPCC default values. These are based on data from a national research study <sup>29</sup> . The recalculation has little impact on annual CO <sub>2</sub> removal by living biomass and no impact on the trend.
	Organic soils under Forestland were also reported in 2011. Areas of organic soils are reported based on the forest management database, with the IPCC default emission factor.
<b>5A2 – Land converted to Forest Land</b>	Data was reorganized in order to match the national data with Marrakesh Accord definitions of Afforestation/Reforestation and Revegetation (to be supplementary reported under the Kyoto Protocol). Updated emission factors have been provided by the currently implemented AR Joint Implementation project.

<sup>29</sup> Giurgiu, et al, 2004, Forest Measurement Methods and Tables

<b>5B – Cropland</b>	Starting with the 2011 submission, a land use change matrix is available, which has led to the re-calculation of all activity data and emission factors compared to previous submissions. Land is represented under Approach 1 of IPCC.
	GHG emissions/removals are estimated. Emissions are computed for perennial croplands (i.e. vineyards and orchards) and the area eligible as activity of Revegetation. For the first category IPCC default factors are used (Tier 1), for the second category country specific data based on country specific information from AR activity (Tier 2).
<b>5C – Grassland</b>	Beginning with the 2011 submission, a land use change matrix is available, which has led to the re-calculation of all activity data and emission factors compared to the previous submissions. Land is represented under Approach 1 of IPCC.
	GHG emissions/removals are estimated for this category for the first time. Under 5C1 category, the C stock change in biomass and soils is reported as NO (Tier 1). C stocks associated with 5C2 are reported based on national C stock reference values (Tier 2).
<b>5D – Wetlands</b>	Beginning with the 2011 submission, a land use change matrix is available, which has led to the re-calculation of all activity data and emission factors compared to previous submission. Land is represented under Approach 1 of the IPCC.
	GHG emissions/removals are estimated for this category for the first time. C stock change in biomass and soils under 5D1 are reported as NO (Tier 1). C stocks associated with 5D2 are reported based on national C stock reference values (Tier 2).
<b>5E – Settlements</b>	Beginning with the 2011 submission, a land use change matrix is available, which has led to the re-calculation of all activity data and emission factors compared to previous submissions. Land is represented under Approach 1 of IPCC.
	GHG emissions/removals are estimated for this category for the first time. C stock change in biomass and soils under 5E1 are reported as NO (Tier 1). C stocks associated with 5D2 are reported based on national C stock reference values (Tier 2).
<b>5F – Other land</b>	Beginning with the 2011 submission, a land use change matrix is available, which has led to the re-calculation of all activity data and emission factors compared to previous submissions. Land is represented under Approach 1 of IPCC.
	GHG emissions/removals are estimated for this category for the first time. C stock change in biomass and soils under 5F1 are reported as NO (Tier 1). C stocks associated with 5F2 are reported based on national C stock reference values (Tier 2).
<b>GHG sources in Tables 5(III), 5(IV)</b>	GHG emissions are newly estimated and reported for some GHG source categories (except for emissions from biomass burning Table 5(V) which had been reported previously). Activity data for the estimation of CO <sub>2</sub> emission from lime application became available for the entire time series. N <sub>2</sub> O emissions from disturbance associated with conversions of land categories to cropland were also reported based on activity data resulted from the land use matrix for both conversions from Wetland.
	Emission factors are the IPCC default ones.

<b>Supplementary reporting under KP LULUCF</b>	
<b>Forest Management</b>	Areas under forest management are identified as areas reported under 5A1 as managed forests, reported in the national statistics as NFF. The information available at the national level corresponds entirely to KP requirements. Consistency with 5A1 is ensured and explained in NIR 2012. The approach for land activity meets the requirements of Reporting Method 2 of the IPCC.
	As under 5A1, C stock changes in SOC, DW, LT estimates are reported as not yet available; activities to improve the characterization of pools, including through the consideration of the relevant datasets (ICP Forest performed in 1996 and 2006), were performed under study 6.
<b>Afforestation / reforestation</b>	The information available at the national level meets KP requirements fully. Consistency with 5A2 is ensured and explained in the NIR 2012. The approach for land activity meets the requirements of Reporting Method 2 of the IPCC.
	C stock change data in all pools is available as a result of monitoring an AR KP JI project, which implements monitoring through repetitive measurements in permanent plots (Tier 2).
<b>Deforestation</b>	The information available at the national level meets KP requirements fully. Consistency with 5A2, 5B2, 5C2, 5D2, 5E2, 5F2, is ensured and explained in NIR 2012. The approach for land activity meets the requirements of Reporting Method 2 of the IPCC. C stock data is derived based on national average standing volume and standing and laying dead wood volume available from the provisional report of the new National Forest Inventory (2008). The emissions associated with the Litter pool are reported based on a national research study.
<b>Revegetation</b>	The information available at the national level meets KP requirements fully. Data is consistent with 5B1, as explained in NIR 2012. The approach for land activity meets the requirements of Reporting Method 2 of the IPCC.
	C stock change data in all pools follow same approach as for AR (under similar technologies and species used for tree plantation in agricultural areas). Data available allow the use of a Tier 2 estimation method, combined with a Tier 1 estimation method when tree plantations are older than 20 years old.
<b>GHG sources in Tables 5(KP-II)3 and 5(KP-II)4</b>	Relevant CO <sub>2</sub> and N <sub>2</sub> O emissions were estimated and reported for 2008 and 2009. Consistency with the inventory reporting was ensured.



**Table 6: Progresses accomplished through the implementation of study 6, besides the elements developed by study 2<sup>30</sup>**

<b>5A – Forest Land</b>	The key planned improvement is the use of the new NFI data in order to report living biomass for the category “Forest Land remaining Forest Land”. This is likely to be available in the 2014 NGHGI submission, as soon as the current growth data becomes available. When available, the time series will be totally or partially recalculated, and thus updated data will be used, at least since 2008 and a method to adequately distinguish between and harmonize amongst the IFF 1984 and NFI 2008 data shall also be implemented. The implementation of 2012 program of work on NFI is therefore instrumental in this regard. Current or future data will allow the use of a Tier 2 estimation method with updated national data.
	Other parameters currently being used have to be updated based on NFI (for example, the volume of standing wood, dead wood, etc.). These improvements were carried out through the implementation of 2012 program of NFI and will also allow for better evaluations of all parameters and proxies related to “forest vegetation outside the national forest fund”, both in terms of structure (composition, age, annual growth, etc.), as well as in relation to the activity data for VFAFF.
	C stock changes in DOM will be derived separately on DW and LT pools. The stock of C from dead wood (DW) pool in Forest Land remaining Forest Land from NFI data will be available for the commitment period (2008-2012). Historically, there is no quantitative data on dead organic matter pool in Romanian forests. For the entire time series the C stock change from dead wood has to be obtained by simulation with a model based on the forest inventory data. At the beginning, the data from IFF 1984 will be employed, as a workaround before NFI data are available, and later on the validated NFI data (as far as NFI will only provide DOM stock at a given moment in time as additional work to generate time changes in this pool will be needed). To that end, the Forest Research and Management Institute Bucharest (ICAS Bucharest) has retrieved the entire database of the inventory of the forest fund 1984 (e.g. standing volume, annual growth, species composition and age structure) at the most disaggregate level available (namely 400 forest districts covering the entire country), and started running CBM-CFS3 (Carbon Budget Model of the Canadian Forest Sector) developed by Werner A. Kurz and CFS Carbon Accounting Team of Natural Resources Canada, Canadian Forest Service, Victoria, BC). Bridging between IFF 84 and NFI 2008 is still tested. Estimating changes in this C pool, as using the simulation and new NFI data will provide results by the end of 2013 and it is expected to be reported on them in the 2014 submission. This will allow for a Tier 3 method <sup>31</sup> .
	A similar simulation will also be used to estimate C stock change in litter (LT) in Forest Land remaining Forest Land and C stock for the estimation of emissions in conversion from Forest Land. Quantitative validation of simulated C stock will be done based on collecting litter data from selected NFI plots. This will allow for a Tier 3 method. LT pool will be reported in the 2014 submission, following the same timing as with reporting of DW.

<sup>30</sup> Based on the results of the study in 2012, new procurement is considered for 2013, in order to allow the implementation of further progresses. Regarding NFI, the data is still being processed so the final results are not yet available.

<sup>31</sup> Methodologies regarding the DW and LT emission estimations have already been completed. The next steps are currently in development as pointed out above.

As to reporting on the change of C stocks in the organic matter in mineral soils (SOC) under a Tier 2 or Tier 3, improvements are expected based on three approaches:

- Simulation of C stocks and changes with the forest increment data given by the IFF 1984. Such simulations will be further validated with the results measured in the NFI and/or management plans database (all/part of C pools: biomass, dead wood, litter). Furthermore, once the actual increment data will be available from the NFI, final simulations will be run in order to obtain the changes in these C pools. CBM empirical models are preferred upon the type of data available (IF84/NFI and harvest statistics) as far as the model operates based on forestry parameters/statistics. A parallel run of Yasso07 (Lisky et al, 2009) might be employed also, using biomass inputs in soil from CBM and global parameters of Yasso07. Later validation exercises will involve the updated NFI data of C stocks in available pools (dead wood and organic matter in mineral soils).
- Soil database of the forest management plans (FMP) combined with the NFI soil available data, are to be used for validation of simulations outputs and also to support application of “not a source” principle for forest management areas. The FMP database contains soil analysis associated to the management activity, gathered since 1960. Datasets are expected to be complete with respect to humus content, site and stand description parameters. Limitation might come from the particularity of sampling points which were randomly and non-repetitively located. In the Romanian forest management planning system, the country national forest fund is “screened” every 10 years, therefore several time series since 1960 are available. The work implies retrieval of datasets (data is currently archived as print) and definition of the statistical processing method.
- Work already carried out by exploring ICP Forest datasets 1994 and 2004. Processing of ICP Forest datasets have shown an annual drop of C stock which is considered non credible under national circumstances ( $\sim 0.5 \text{ t C/ha/yr}$  for any type of soils). The problem seems to be related to the methodological differences in 1994 (humus on 30 cm depth determined by Kjeldahl) and 2004 (method involved elemental analyzer on 40 cm depth) or incomplete information on the management approaches in the sampling plots (issues to be further analyzed). Under limited data, it was not possible to credibly harmonize these data, but further analysis is expected to be finalized next year. Another option would be to re-sample the C content in the same known plots in 2012, having used a method consistent with the one in 2004.
- The work is expected to provide results by the end of 2013 and reported in the 2014 submission.

Despite likely negligible emissions from organic soils on Forest land (such area is generally under protected areas, as explained in the version 4 of the 2011 NGHGI), activity data needs to be rechecked based on country databases and underlying national definitions and IPCC guidelines, which will allow reaching a Tier 2 for activity data. The IPCC default emission factor will continue to be used. Tier 2 estimates will be developed. Results are expected by the end of 2013, and will be incorporated in the 2014 NGHGI.

<b>5B – Cropland</b>	Study 6 also encompasses a research project related to reporting soils for all land categories and various conversions. The purpose of the project is to reach Tier 2 of IPCC for emission factors, starting from country specific data on soils C stocks and development of C stock adjustment factors starting from IPCC default values and structure on crop rotation, fertilization and technology applied. Organic soils areas need to be rechecked, estimated and have the emissions reported in accordance with the country databases and the national and IPCC guidelines. The work will be based on the "Monitoring soil quality in Romania" dataset <sup>32</sup> and other available national data and references. Results are expected by the end of 2013, and will be incorporated in the 2014 submission.
<b>5C – Grassland</b>	With respect to the 5.C.1 - Grassland remaining Grassland category, study 6 also encompasses a research project related to reporting emissions from soils for all land categories and related conversions. The purpose of that project is to reach a Tier 2 of IPCC for emission factors, starting from country specific data on soils C stocks (reference values) and adaptation of C stock adjustment factors (starting from IPCC default values) based on other information on pasture and hayfield management and adequate expertise from these sectors. The works will be based on the "Monitoring soil quality in Romania" dataset and other available national data and references. Results are expected by the end of 2013, and will be incorporated in the 2014 submission.
<b>5D – Wetlands</b>	As previously mentioned for grassland and cropland, the calculation of emissions from conversion to wetlands will be presented in a future version of the national GHG inventory, based on national data available in the database of the project "Monitoring soil quality in Romania" (ICPA, 2006), considering the IPCC methodologies available. For reporting C stock changes in soils a Tier 2 is expected. Results are expected by the end of 2013, and will be incorporated in the 2014 submission.
<b>5E – Settlements</b>	Reference C stock in the soils under settlements could be reanalysed as well as the transition period to this category. For reporting C stock changes in soils a Tier 2 is expected. Results are expected by the end of 2013, and will be incorporated in the 2014 submission.
<b>5F – Other land</b>	The land use change matrix is subject to continuous verification and improvement, and ways to control and verify the parameters specific to this land category need to be further improved. Additional exploration of national soils databases will be enclosed in study 6 in order to improve reporting on soils. For reporting C stock changes in soils a Tier 2 is expected. Results are expected by the end of 2013, and will be incorporated in the 2014 submission.
<b>Supplementary reporting under KP LULUCF</b>	
<b>Forest Management</b>	Planned improvements are described under item 5A Forestland, above. Available activity data are consistent with the requirements under Approach 2 for land representation of KP activities. Actions described above under 5A to develop C stock change factors will allow a Tier 2/3, for C stock changes in SOC, DW and LT pools. Results on living biomass growth are expected by the end of 2013, while those on SOM, DW and LT are expected to be reflected in the reporting by 2014 submission.

<sup>32</sup> The retrieval of datasets from the "Monitoring soil quality in Romania" project are underway, as well as from other references and national data.

<b>Afforestation / reforestation</b>	Planned improvements are linked with the AR KP Joint implementation project implemented in Romania <sup>33</sup> , which will offer data on C stock change factors for SOC, DW and LT for this activity (to be either used for reporting estimates or support “no source” in small pools). These improvements will allow a Tier 2 for all pools and will be reported in the late 2013 submission or 2014 submission as soon as the data has been verified.
<b>Deforestation</b>	Activity data was checked in order to ensure the incorporation of all emissions from deforestation of any land converted from forest. Planned improvements of C stock change factors are related to the improvements described under item 5A Forestland, mainly updated value of national /regional average biomass C stock before conversion from standing wood stock and standing and fallen dead wood stock (both from NFI), while LT can be derived from simulations and validated by direct measurements. These improvements will allow a Tier 2 for all pools and will be reported in the 2014 submission.
<b>Revegetation</b>	Improvements referred to refining activity data in order to improve data structure with regards to tree species. These improvements will allow a Tier 2 for all pools and will be reported in 2014 submission.
GHG emission tables	Confirmation of activity data by further in-depth checks of sectoral reporting statistics. The results will allow reaching Tier 2 for activity data and results will be reported in 2014 submission.
NIR text	Updating the text of Ch. 7 on LULUCF inventory and Ch. 11 on KP LULUCF activities.

<sup>33</sup> Further details on the AR project under Article 6 of the KP, including also the explanation on the significance of the project to the NS/NGHGI are provided in the Annex.

## Abbreviations

Abbreviation	Description of the abbreviation
AR	Afforestation/Reforestation
ARR 2010	Report of the individual review of the annual submission of a Party submitted in 2010
ARR 2011	Report of the individual review of the annual submission of a Party submitted in 2011
ARR 2012	Report of the individual review of the annual submission of a Party submitted in 2012
BEF	Biomass expansion factor
C	Carbon
CC	Compliance Committee
Ch.	Chapter
CMP	Conference of the Parties serving as the Meeting of the Parties
DRPCIV	Directorate on Driving Licenses and Vehicles Registration in the Ministry of Administration and Interior
DW	Dead Wood
EB	Enforcement Branch
EC	European Commission
EEA	European Environment Agency
ERT	Expert Review Team
EU-ETS	European Union Emissions Trading Scheme
EU-MM	European Union-Mechanism for Monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol
FMP	Forest Management Plans
GHG	Greenhouse Gas
GIS	Geographic Informational System
Gov.	Governmental
ICAS Bucharest	Forest Research and Management Institute Bucharest
ICP	International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests operating under the UNECE Convention on Long-range Transboundary Air Pollution
ICPA	National Research and Development Institute for Soil Science, Agro-chemistry and Environment
IFF	Forest Fund Inventory

IPCC	Intergovernmental Panel on Climate Change
IPCC 1996	Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories
IPGG GPG 2000	IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, 2000
IPCC GPG 2003	IPCC Good Practice Guidance for Land Use, Land Use Change and Forestry, 2003
IT	Information Technologies
JI	Joint Implementation
KP	Kyoto Protocol
LPG	Liquefied Petroleum Gas
LT	Litter
MEF	Ministry of Environment and Forests
NA	Not applicable
NE	Not estimated
NFA	National Forest Administration
NFF	National Forest Fund
NFI	National Forest Inventory
NO	Not occurring
NEPA	National Environmental Protection Agency
NGHGI	National Greenhouse Gas Inventory
NIR	National Inventory Report
NS	National System for the estimation of anthropogenic greenhouse gas emissions by sources and removals by sinks under Article 5, paragraph 1, of the Kyoto Protocol
Para.	Paragraph
Procedures and Mechanisms	Procedures and mechanisms related to compliance under the Kyoto Protocol, annex to Decision 27/CMP.1-FCCC/KP/CMP/ 2005/8/Add.3
RAR	Romanian Automobile Register
QA	Quality Assurance
QC	Quality Control
QI	Questions of Implementation
R	Root-to-shoot factor
Rules of Procedure	Rules of Procedure of the Compliance Committee of the Kyoto Protocol
“Saturday paper”	Problems and Further Questions from the ERT formulated in the course of the 2011 in-depth review of the greenhouse gas inventories of Romania submitted in 2010
SOC	Soil Organic Carbon
VFAFF	Forest Vegetation Outside the Forest Fund

## **Appendix 1: Fact sheets on “Romania Afforestation of Degraded Agricultural Land Project”, a Joint Implementation Project under Art 3.3 of the Kyoto Protocol**

### **Project partners**

Prototype Carbon Fund (administrated by World Bank) and National Forests Administration Romsilva (Romania). NFA Romsilva is funding project implementation and monitoring. Project monitoring is done by the Forest Research and Management Institute (ICAS Bucharest) (for more information please contact: Mr. Liviu Ciuvat, [alexandru.ciuvat@icas.ro](mailto:alexandru.ciuvat@icas.ro)).

**On-line information** <http://ji.unfccc.int/JIITLProject/DB/UUPQK3EXX9F5KBJQ4PGDO6WWTDLRD7/details>

**Project activity:** Afforestation of agricultural marginal and degraded land under Art 3.3 of the Kyoto Protocol.

### **Project location**

Lands to be afforested are located in the South-West, South East and East of Romania, in areas affected by droughts and currently containing an extremely low percentage of forests. Project area encompasses 6496 ha, out of which an area of 6033 ha is subject to planting of forest tree species. By project activity, arable and degraded pasture lands are converted to forest land (assuming both land use and previous official land use classification). The project area consists of several groups of contiguous lands areas larger than 300 ha, whose contours are GIS mapped. The project area represents some 25 % of total AR area reported by Romania under the KP supplementary reporting.

### ***Project implementation and monitoring schedule***

The Emission Reduction Purchase Agreement associated to the project was officially signed in September 2003. Project baseline, initial verification and determination were also done in 2003. Verification of the project activity was planned for 2007, 2012 and 2017. Independent verification by TÜV Sud (Germany) was performed in 2007. The verification was followed by an adjustment of the C accumulation for the rest of project period, till 2017, under natural disasters affecting plantation (i.e. Danube flooding of part of the project area in 2006).

### ***Monitoring of C accumulation in the project area***

Project monitoring is implemented according to “MONITORING PLAN FOR CHANGES IN CARBON STOCKS IN FOREST PLANTATIONS” agreed between the project partners on November 24, 2003. Insignificant improvement of monitoring plan occurred after the first independent verification in 2007. Project monitoring occurs on an annual basis (in order to issue an annual report on project implementation) and periodically (in order to independently measure, estimate and verify the net removal from the project activity).

*Annual report* provides data on actual planted area on species/group of species; annual survival rate of seedlings; type and amount of fuels and fertilizers used each year; forest fire affected areas; amount of wood collected. Monitoring is achieved at most detailed management unit level, which allows GHG emissions and CO<sub>2</sub> removal to be tracked back in time before tree plantation.

*Periodic 5-year monitoring consists in measurements of the amount of C in all pools in 185 permanent monitoring plots following the procedures described in the monitoring plan. C stock in biomass, litter and dead wood pools was measured in 2007 and 2012 and is planned to be re-measured in 2017. C stock in soils was measured in 2003 (the baseline) and 2012, and it will be re-measured 2017. The 2012 measurements haven't been yet officially verified.*

Project specific QA/QC rules cover sampling, analytical proceedings and data archiving.

### ***Briefing on C stock measurements and estimation***

Actual payment relies on estimations of C stock changes in C pools measured with the 5-years periodic measurements and annual records of GHG emissions from sources. Projections were only needed to allocate future funding and amend the contract between the partners, when necessary.

*Biomass measurements. In 2012 the second project (periodic) monitoring has been performed , which includes tree sampling in 185 permanent monitoring plots, according to the monitoring plan. Measurements have not been yet officially verified. Collar diameters (DCH) and whenever possible breast height diameters (DBH) of the seedling/trees are measured. Tree height (H) is also measured for each sampled tree. Project site-specific and species-specific biomass equations for individual tree are available (Blujdea et al., 2012).*

Since the project plantations are now only maximum 10 years old, an additional project<sup>34</sup> covering older stands was implemented by ICAS (over 2007-2009), so these biomass equations are actually available for trees in stands 15-25 years old, depending on species. Current year funding from NFA on JI project monitoring also covers: i) validation of current biomass equations with trees from JI project area and ii) development of equations for young stands, assuming entries on forest tree species and plantation age.

*Litter (LT) and Dead wood (DW) C stocks are measured in the 10<sup>th</sup> year of the project and entire C stock will be attributed to the project activity. Procedures are described in the management plan; total number of samples will reach 740. Activity data for C stock changes in these pools is derived from project area stratification on species/group of species.*

*C stock change in soil organic matter pool (SOC) is estimated by stock change method, assuming a statistically significant difference between baseline and 2012 C stocks. C stock is measured for 30 cm depth, following the standard procedure described in the monitoring plan. Activity data for C stock changes in this pool is derived from the stratification of project area on soil types (available in the baseline).*

*Sources of GHG emissions* are recorded in a standard *project sheet* which is filled in annually by each forest district implementing the project.

Project data is archived both by local forest districts (which also fill a statistical report on the respective year afforestation/reforestation activities, SILV 4, required by the National Institute of Statistics). Project data is further centralized by the NFA and ICAS.

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<sup>34</sup> 'Modelling C sequestration in transitory forms of ecosystems associated to land use change in Romania' (FORLUC) 2007-2009, funded by Ministry of Research and Education (Romania)



### ***Suitability of JI data for KP's afforestation/reforestation removal estimation***

The JI project area is the area where the majority of AR occurred since 1990, thus a full compatibility of C accumulation pattern in the ecosystem pools is assumed. In order to capture biomass variability, additional geo-referenced plots for tree biomass sampling and stands measurements were established in the additional research project area (see the References section below).

Currently there are some short time projections involved in KP AR reporting (based on yield tables and the software CO2fix), which will be replaced in the future by data resulting from project monitoring in 2012, which will allow reporting based on measured data, which fits well with selected option of accounting at the end of the commitment period.

### ***Significance of the JI project to the national system and national GHG inventory***

Implementation of the JI project offered an early learning opportunity to a research group from ICAS on the understanding of challenges related to estimation in AR activity and reporting requirements under Kyoto Protocol. While the JI project has its own database, lands which are part of the project can be also accurately tracked via statistical report SILV 4 (which is the base for reporting AR at the country level) down to forest management planning database and to forestland parcels/compartments. Annual monitoring of the project is consistent with NFA's financial documentation and statistical reporting to National Institute of Statistics (SILV 4). Both databases include maps, as well as stand and ecosystem information at most detailed level (i.e. species composition, age, soil type). JI project triggered improvement of capacity by funding several research projects implemented by ICAS and Forestry Faculty of "Transilvania" University Brasov, and also improved National Forest Administration capacity to manage climate change mitigation related issues. The JI project also supported the application of the Tier 2 estimation of C stock change in living biomass and dead organic matter pools for land converted to forest land (5A2 CRF category) and art. 3.3 afforestation/reforestation activity (KP-LULUCF reporting).

### **References**

- Blujdea V.N.B., Pilli R., Dutca I., Ciuvat L. and Abrudan I.V. (2012) *Allometric biomass equations for young broadleaved trees in plantations in Romania*. Forest Ecology and Management (264) 172-184. [doi:10.1016/j.foreco.2011.09.042](https://doi.org/10.1016/j.foreco.2011.09.042)
- ICAS Bucuresti (2003) Monitoring plan for changes in carbon stocks in forest plantations