

Final report of the 2012 technical
review of the greenhouse gas emission
inventory of The Czech Republic
to support the determination of annual emission
allocations under Decision 406/2009/EC

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Introduction

Pursuant to Article 3.2 of Decision 406/2009/EC⁽¹⁾ (the 'Effort Sharing Decision' – ESD), the European Commission shall determine the annual emission allocations (maximum allowed greenhouse gas emissions) of Member States for the period from 2013 to 2020 in tonnes of carbon dioxide equivalent (CO₂ eq.), using reviewed and verified emission data.

Complete sets of greenhouse gas (GHG) emission estimates for the reference years (2005, 2008, 2009 and 2010) were submitted by each Member State by the 15th of May, 2012 as part of the 2012 national inventory submission under Decision 280/2004/EC (the 'Monitoring Mechanism Decision' – MMD). These estimates must have been reviewed to allow the determination in 2012 of the annual emission allocations for the period from 2013 to 2020.

The 'Guidelines for the 2012 technical review of greenhouse gas emission inventories to support the determination of Member States' annual emission allocations under Decision 406/2009/EC' were endorsed by the Climate Change Committee on 19 May 2011 and published as a European Commission Staff Working Document on 26 April 2012⁽²⁾. The 2012 greenhouse gas emission inventory of The Czech Republic was reviewed in accordance with these guidelines.

This report presents the findings of the 2012 technical review of the greenhouse gas emission inventory of The Czech Republic to support the determination of annual emission allocations under Decision 406/2009/EC.

Review Objectives

The purpose of the technical review of Member States' GHG inventories is to support the determination of the annual emission allocations by:

- a) ensuring that the European Commission has accurate, reliable and verified information on annual GHG emissions for the years 2005, 2008, 2009 and 2010 to determine the annual emission allocations under Decision 280/2004/EC;
- b) providing the European Commission and its Member States with a consistent, transparent, thorough and comprehensive technical assessment of GHG emissions, with a focus on data for the years 2005, 2008, 2009 and 2010 reported in 2012;
- c) examining, in a facilitative and open manner, the reported inventory information for consistency with the 'Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories', with the 2000 'Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories', and with the requirements of Decision 280/2004/EC (the 'Greenhouse Gas Monitoring Mechanism' Decision)⁽³⁾;

⁽¹⁾ Decision No 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020. OJ L 140, 5.06.2009, p. 136.

⁽²⁾ Commission Staff Working Document of 26 April 2012: Guidelines for the 2012 technical review of greenhouse gas emission inventories to support the determination of Member States' annual emission allocations under Decision 406/2009/EC. SWD(2012) 107 final.

⁽³⁾ Decision No 280/2004/EC of the European Parliament and of the Council of 11 February 2004 concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto protocol. OJ L 140, 5.06.2009, p. 136.

- d) assisting Member States in improving the quality of their GHG inventories.

Review approach and scope

The technical review of the 2012 GHG inventory estimates of The Czech Republic for the years 2005, 2008, 2009 and 2010 was performed by a Technical Expert Review Team (TERT) under service contract 2011/S 234-378130 to the Directorate General for Climate Action of the European Commission.

The review was conducted by the following experts: Kristien Aernouts & Tomas Gustafson for Stationary combustion (CRF categories 1.A.1, 1.A.2, 1.A.4, 1.A.5) + Reference approach; Maria Liden & Tinus Pulles for CRF categories 1.A.3 Transport + 1.C International bunkers; Ralph Harthan & John Watterson for CRF category 1.B Fugitive; Anke Herold & Ils Moorkens for CRF categories 2.A Mineral products + 2.B Chemical industry + CRF sector 3 Solvents; Kristina Saarinen & Dusan Vacha for CRF categories 2.C Metal production + 2.D Other production + 2.G Other; Maria Jose Lopez & Karin Kindbom for CRF categories 2.E Production of Halocarbons and SF₆ + 2.F Consumption of Halocarbons and SF₆; Michael Anderl & Steen Gyldenkaerne for CRF categories 4.A Enteric fermentation + 4.B Manure management; Sorin Deaconu & Etienne Mathias for CRF categories 4.C Rice cultivation + 4.D Agricultural soils, 4.E Prescribed burning of savannas, 4.F Field burning of agricultural residues; Juraj Farkas & Celine Gueguen for CRF sector 6 Waste. Ole-Kenneth Nielsen, Suvi Monni, Klaus Radunsky and Tatiana Tugui acted as lead reviewers. The review was coordinated by Bernd Gugele and Justin Goodwin. The TERT acknowledges the support of the EEA review secretariat Martin Adams, Francois Dejean and Melanie Sporer.

This technical review was performed on the basis of GHG emission data and the national inventory report (NIR) officially reported by Member States by the 15th of April, 2012 under the MMD. Resubmissions reported by Member States were taken into account until the 15th of May, consistent with the reporting practice for resubmissions under Decision 280/2004/EC. Emissions from international transport and land use, land-use change and forestry (LULUCF) were not reviewed. The review was performed with a focus on data for the years 2005, 2008, 2009 and 2010, reported in 2012.

The technical review process for GHG inventories comprised three stages, each of which considered different aspects of the inventories in such a way that the purposes described above were achieved by the end of the process. The three stages were:

- Stage 1, completed by 15 April 2012 – initial completeness checks of each Member State GHG inventory (submitted by 15 January and by 15 March);
- Stage 2, completed by 15 April 2012 – initial consistency and comparability checks of each Member State GHG inventory (submitted by 15 January and by 15 March);
- Stage 3, to be completed by the end of August 2012 – detailed *technical review* of each Member State GHG inventory (submitted by 15 May).

The detailed timeline of the review, including a summary of the correspondence with The Czech Republic, is presented in Annex 4.

ESD 2012 technical review conclusions

Table 1. Main conclusions from the TERT

Findings
1. The TERT considers that the GHG emission inventory estimates of The Czech Republic for the years 2005, 2008, 2009 and 2010 submitted in 2012 under the MMD included emission overestimates .
2. The TERT did not identify inconsistency issues between the reported GHG emission inventory estimates and verified emission data under the EU ETS.
3. During the course of the technical review, the TERT received revised GHG emission inventory estimates from The Czech Republic in response to its initial findings (see Table 2).
4. The TERT considers that the aggregated revised GHG emission inventory estimates from The Czech Republic for the years 2005, 2008, 2009 and 2010 still include emission overestimates .
5. The TERT therefore suggests that it is necessary to implement a technical correction to the GHG emission inventory estimates and to amend the reported GHG total (see Table 2).
6. As stated beneath Table 1, The Czech Republic accepts the aggregated GHG emission inventory estimates presented in Table 2 including any revised estimate received from The Czech Republic and accepted by the TERT, and technical corrections as proposed by the TERT.
7. The TERT identified non-binding recommendations for improvements of The Czech Republic's GHG inventory (see Table 3 in Annex 1).
8. The TERT considers that it received a response from The Czech Republic that was sufficient in order to undertake the review appropriately.

Statement from The Czech Republic on the conclusions of the TERT

The Czech Republic party notes and accepts main conclusions from TERT.

Table 2. Summary of national totals, including any revised estimates or technical corrections identified during the review

Data / Category	Reference	Status of GHG emission revision or correction	2005	2008	2009	2010
			Gg CO ₂ eq.			
Total GHG emissions as reported in the 2012 submission under the MMD	19 April 2012, CZE-2012-v1.1 (generated 13 April 2012)		146 326.002	143 662.621	134 722.299	139 157.863
Revised estimates provided by The Czech Republic ⁽⁴⁾						
1A2c liquid fuels, all gases	5 July 2012 ('correction 1A2c by EKOM.xls') provided by CZ and accepted by TERT	Accepted by the TERT	-1 105.200	-1 631.640	-1 495.220	-1 760.660
Crop residue, N ₂ O	20 June 2012, Corr_CZ-4C-4F-3_FracR.xls, CZ-4C-4F-3	Accepted by the TERT	-72.064	-77.494	-72.920	-64.176
Technical correction proposed by the TERT ⁽⁵⁾						
2F3. Fire extinguishers, HFCs	CZ-2E+2F-2	Accepted by			-46.810	-52.210

⁴ Difference: revised estimates – original estimates. A positive difference indicates an increase compared to reported emissions. A negative difference indicates a decrease compared to reported emissions. For more information on revised estimates, see Annex 1.

⁵ Difference: technical correction – original estimates. A positive difference indicates an increase compared to reported emissions. A negative number indicates a decrease compared to reported emissions. For more information on technical corrections, see Annex 2.

Total GHG emissions including any accepted revised estimate received from The Czech Republic and/or technical correction as proposed by the TERT		the Czech Republic	145 148.738	141 953.488	133 107.349	137 280.817
CO₂ emissions from 1.A.3.a Civil aviation	19 April 2012, CZE-2012-v1.1 (generated 13 April 2012)		9.202	8.554	7.975	9.084

Note: National totals exclude emissions from LULUCF and emissions reported under memo items (e.g. international aviation and maritime transport).

Annex 1 – Recommendations, revised estimates and technical corrections

Table 3. Recommendations of the TERT

Key category	Gas, fuel, activity	Observation	Recommendation	Revised estimate ⁽⁶⁾	Technical correction ⁽⁷⁾
Yes	1.A.2.c. Chemicals All gases All years	The Czech Republic made a large recalculation for liquid fuels in 1A2c (an increase compared to the previous submission). The total of liquid fuels in the Czech Republic reported in the CRF tables is also higher than Eurostat data. There is a possible double count of emissions in liquid fuels in 1A2c. During the review, the Czech Republic responded that they had included a part of the naphtha used as feedstock as liquid fuels in 1A2c, but that instead of taking 20 %, they had mistakenly taken 70 % (in 2005) or 80 % (in 2008-2010) of the naphtha as oxidised. The Czech Republic provided the correction of the data in an excel file and provided additional information to support its assumptions. . Following the explanations provided the TERT accepted the revised estimates.	The TERT recommends that the revised estimates are reflected in future submissions. Furthermore, the TERT recommends that time-series consistency is ensured by implementing the revision for all relevant years of the time-series.	Yes	No
Yes	1.A.3.b. Road transportation	The TERT noted that the implied EF for CO ₂ from diesel oil in road transport is higher between 2001 and 2005	The TERT recommends that the fluctuations in NCV is	No	No

⁶ The GHG emission estimate for this category was revised by The Czech Republic during the technical review.

⁷ The GHG emission estimate for this category is subject to a technical correction proposal by the TERT.

Key category	Gas, fuel, activity	Observation	Recommendation	Revised estimate ⁽⁶⁾	Technical correction ⁽⁷⁾
	CO ₂ All years	(74.9–75.0 kg/GJ) compared to the other years in the time series (73.4–73.9 kg/GJ). The methodology used in the Czech Republic for estimating emissions from Road Transport employs emission factor related to the unit of weight rather than energy (i.e. in g/kg fuel, not in g/TJ energy). The TERT therefore concluded that the IEF is not directly linked to the emission estimate and reflect assumptions in its conversion from kg fuel to TJ energy in the AD presented in the CRF and not directly related to the emission factors used.	further investigated and documented since, it is expected that there would be a correlation between the NCV and the carbon content of the fuel.		
Yes	2.F(a).1. Refrigeration and air conditioning equipment HFC All years	Refrigeration and air conditioning equipment is the main source of F-gases emissions in the Czech Republic. Emissions from Refrigeration and air conditioning equipment is primarily from first re-fill, from servicing old equipment and from the production of new equipment. However, the TERT concluded that the methodologies used might underestimate emissions as information about the lifetime of products containing F-gases and their emissions from disposal are not taken into account. The 2012 NIR (page 163) specifies that it is expected that, in the near future, a new model taking into account the lifetimes of refrigeration and air conditioning equipment will be developed and implemented. It is also planned to perform an uncertainty assessment. In the current submission, only emissions from bulk import and export are calculated and reported.	In order to avoid underestimations and improve the accuracy of the estimates, the TERT recommends that the Czech Republic continues to verify the data sources and improve the methodologies, the assumptions and the results in order to prepare improved estimates for the whole time series. In particular, the TERT recommends that the Czech Republic considers the lifetime of products containing F-gases and estimate emissions from equipment disposal in the refrigeration and air conditioning subcategory.	No	No

Key category	Gas, fuel, activity	Observation	Recommendation	Revised estimate ⁽⁶⁾	Technical correction ⁽⁷⁾
		Although the first results have already been published (Karbanová, 2008; Vacková and Vácha, 2008), the Czech Republic was not able to continue and successfully finish this work.			
Yes	2.F(a).3. Fire extinguishers HFC 2009, 2010	Please see technical correction reference CZ-2.E.+2.F-2. in Annex II	The TERT recommends that the inventory is revised to address the issues raised in the technical correction. Furthermore, the TERT recommends that time series consistency is ensured by implementing the revision for all relevant years of the time series.	No	Yes
Yes	4.D.1. 4. Crop Residue N ₂ O 2005; 2008-2010	The use of a value of 0.45 for $Frac_R$ is inconsistent with the provisions in pages 4.59 and 4.63 of IPCC good practice guidance: the equation 4.28 of IPCC good practice guidance uses a default value of 2 to convert the Nitrogen amount in the N-fixing and non-N-fixing crops annual production to total aboveground crop residue and product which is not consistent with the $Frac_R$ value of 0.45. During the review the Czech Republic provided revised estimates for N ₂ O emission from crop residue for 2005 and 2008-2010. The TERT agreed with the revised estimates.	The TERT recommends that the revised estimates are reflected in future submissions. Furthermore, the TERT recommends that time-series consistency is ensured by implementing the revision for all relevant years of the time-series.	Yes	No
Yes	4.D.1.4. Crop residue N ₂ O 1990–2010	Following the analysis of the answer and the calculation sheet provided by the Czech Republic during the review, the TERT concluded that emissions from the cultivation of lucerne and red clover are not included in the GHG Inventory; the TERT also found that, according to the data available from the Czech	TERT recommends that the Czech Republic estimates the emissions associated with the cultivation of lucerne and red clover, as part of the nitrogen-fixing crops and Crop residue categories, in accordance with the methodologies in the 2000 IPCC GPG.	No	No

Key category	Gas, fuel, activity	Observation	Recommendation	Revised estimate ⁽⁶⁾	Technical correction ⁽⁷⁾
		<p>Statistical Office, lucerne and red clover are cultivated in the country. In accordance with the provisions on pages 4.57 and 4.59 of the 2000 IPCC Good Practice Guidance (GPG), the emissions from the cultivation of lucerne and red clover should be estimated as part of the nitrogen-fixing crops and Crop residue categories and therefore the TERT concluded that the estimates for agriculture in the Czech Republic are underestimated.</p>			

Annex 2 – Detailed technical corrections

Name of technical correction	Fire extinguishers				
Reference to transcript finding record	CZ-2.E+2.F-2				
Subsector	2.F(a).3 Fire extinguishers				
Gas/fuel/activity	HFC				
	2005	2008	2009	2010	
Original estimate			72.01	80.32	Gg CO ₂ eq.
Corrected estimate			25.20	28.11	Gg CO ₂ eq.
The underlying problem	HFC emissions from fire extinguishers have increased by a factor of 3.5 from 2008 to 2010. This subcategory represents 7.4 and 5.6 % of total F-gas emissions of the Czech Republic in 2009 and 2010. The HFC emissions per capita of this subcategory in the Czech Republic are among the highest of the reporting Member States. The trend, methods and data sources used to elaborate the estimates are not clearly explained in the NIR.				
The rationale for the technical correction	The Czech Republic has assumed that the ratio between potential and actual emissions is 1 in 2009 and 2010 and around 2.85 in previous years. During the ESD review the Czech Republic explained that the reason for the increase was a conservativeness approach due to the lack of data in 2009 and 2010. This conservative approach constitutes an overestimate of emissions for 2009 and 2010.				
The assumptions, data and methodology used to calculate the technical correction	Use of the same assumption, data and methodology of the Czech Republic without the conservative approach. Assumption, as in previous years, that 35 % of HFC imported was released by fire extinguishers instead of 100 % in 2009 and 2010.				

Response from The Czech Republic on all technical corrections

Czech Republic notes and accepts technical corrections concerning “**Fire extinguishers**”.

Final remarks by TERT

The TERT thanks The Czech Republic for the very good cooperation during the review process.

Annex 3 – Checks and tests completed

The initial checks (stage 1 and 2 checks), which cover the national inventory submissions, informed the stage 3 technical review with a view to:

- a) assess whether all emission source categories and gases are reported as required under Decision 280/2004/EC;
- b) assess whether sub-category sums are consistent with sectoral and national totals;
- c) assess whether emission data time series are consistent;
- d) assess whether implied emission factors across Member States are comparable;
- e) assess the use of 'Not Estimated' notation keys where IPCC Tier 1 methodologies exist;
- f) compare with the previous year's inventory submission of the Member State;
- g) limited sector-specific checks performed by ETC/ACM sector experts.

The EU initial checks were extended in 2012 to address additional elements needed for the 2012 technical review. The extended checks included:

- a) a detailed analysis of recalculations performed for the 2012 inventory submissions, in particular if recalculations are based on methodological changes.
- b) a comparison of the verified emissions reported under the EU ETS with the greenhouse gas emissions reported in GHG inventories. The verified emissions under the EU ETS are not fully comparable with the emissions reported in the GHG inventories. This comparison may only highlight areas where some Member States' data and trends deviate considerably from those of other Member States.
- c) a comparison of the results from Eurostat's reference and sectoral approach, based on energy data reported under Regulation (EC) No 1099/2008, with the Member States' reference and sectoral approach.

The specific activities of the 2012 technical review included:

- a) an analysis of the Member States' implementation of recommendations related to improving inventory estimates in accordance with the Revised 1996 IPCC Guidelines and the 2000 IPCC good practice guidance (GPG) as listed in the UNFCCC Annual Review Reports from the 2010 and 2011 UNFCCC review processes. Where UNFCCC recommendations have not been implemented, the analysis included an assessment as to whether the Member State provided adequate justification for this;
- b) an assessment of the time series consistency of the greenhouse gas emissions estimates, with a particular focus on the 2005 and 2008-2010 estimates;
- c) checking whether problems identified for one Member State in UNFCCC reviews might also have been a problem for other Member States (whether identified by the UNFCCC expert review team or not);
- d) an assessment of any recalculations made by a Member State in its inventory since the previous submission, and an assessment as to whether these were transparently reported and were in accordance with IPCC good practice guidance;
- e) a follow-up on any outstanding findings from existing and extended stage 1 and 2 checks;
- f) the inclusion of revised estimates as provided by Member States in response to the review, and as accepted by the TERT during the review;
- g) the provision of an estimate for any 'technical correction' to emission estimates reported by a Member State where it is believed that emissions reported by the Member State are

overestimated, and a statement of the significance of these 'technical corrections' in comparison to the overall reported inventory estimates;

- h) the provision of recommendations where problems have been identified that do not require technical corrections.

Material from previous UNFCCC inventory reviews was used to inform the technical review, including the previous years' Annual Review Reports, which provide an indication of the overall quality of the inventory.

The TERT used additional technical information in the review process, such as EU ETS data, information from Eurostat, and F-gas data from the 'Preparatory study for a review of Regulation (EC) No 842/2006 on certain fluorinated greenhouse gases (⁸), as well as data from other international organisations.

⁸ Service contract 070307/2009/548866/SER/C4 to the European Commission

Annex 4 – Correspondence references

Date	Reference
19 April 2012	Final CRF and NIR submission under the MMD, version CZE-2012-v1.1
21, 23 May 2012	Initial questions raised by the TERT during the desk review
7, 11, 13 June 2012	Additional questions raised by the TERT during the centralised review
4, 8, 14, 20 June 2012	Responses from the Czech Republic to TERT questions
21 June 2012	Draft technical corrections from TERT to the Czech Republic
4 July 2012	Response from the Czech Republic to TERT draft technical corrections
13 July 2012	Draft review report from TERT to the Czech Republic
2 August 2012	Response from the Czech Republic to draft review report
13 August 2012	Draft final review report from TERT to Czech Republic
17 August 2012	Final review report to European Commission