Final report of the 2012 technical review of the greenhouse gas emission inventory of Slovakia

to support the determination of annual emission allocations under Decision 406/2009/EC

17 August 2012

Reference: DG CLIMA.C.1/SER/2011/0019

Umweltbundesamt GmbH
Spittelauer Lände 5
1090 Vienna
Austria

Content

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 (CO_2 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 Slovakia was reviewed in accordance with these guidelines.

This report presents the findings of the 2012 technical review of the greenhouse gas emission inventory of Slovakia 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 Slovakia 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 SF_6 + 2.F Consumption of Halocarbons and SF_6; 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 Slovakia, is presented in Annex 3.

ESD 2012 technical review conclusions

Table 1. Main conclusions from the TERT

Findings
1. The TERT considers that the GHG emission inventory estimates of Slovakia 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 Slovakia in response to its initial findings (see Table 2).
4. The TERT considers that the aggregated **revised** GHG emission inventory estimates from Slovakia for the years 2005, 2008, 2009 and 2010 **do not include emission overestimates**.
5. The TERT suggests that **it is not necessary to implement technical corrections** to the GHG emission inventory estimates and to amend the reported GHG total.
6. As stated beneath Table 1, Slovakia **accepts** the aggregated GHG emission inventory estimates presented in Table 2 including any revised estimate received from Slovakia and accepted by the TERT.
7. The TERT identified non-binding recommendations for improvements of Slovakia's GHG inventory (see Table 3 in Annex 1).
8. The TERT considers that it received a response from Slovakia that was sufficient in order to undertake the review appropriately.

Statement from Slovakia on the conclusions of the TERT

Slovakia accepts the conclusions of the TERT provided in the Table 1 and the Table 2 without comments.

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 Gg CO_2 eq.	2008 Gg CO_2 eq.	2009 Gg CO_2 eq.	2010 Gg CO_2 eq.
Total GHG emissions as reported in the 2012 submission under the MMD	14 April 2012, SVK-2012-v1.3		51 212.711	50 077.909	44 191.069	45 981.866
Revised estimates provided by Slovakia ([4])						
1.A.4.b. Natural gas, CO_2	7 June 2012: ID: SK-1A1, 1A2, 1A4, 1A5-7. File: QA SK overview questions_07-06-2012_Answers_SVK, SK-1A1, 1A2, 1A4, 1A5-7	Accepted by the TERT		-116.292		
Total GHG emissions including any accepted revised estimate received from Slovakia and/or technical correction as proposed by the TERT			**51 212.711**	**49 961.618**	**44 191.069**	**45 981.866**
CO_2 emissions from 1.A.3.a Civil aviation	14 April 2012, SVK-2012-v1.3		10.535	15.088	6.244	5.836

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

[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.

Annex 1 – Recommendations, revised estimates and technical corrections

Table 3. Recommendations of the TERT

Key category	Gas, fuel, activity	Observation	Recommendation	Revised estimate ([5])	Technical correction ([6])
Yes	1.A. Stationary combustion 2005–2009	Large recalculations were performed for the 2012 submission. Summary information was provided in the NIR but no detailed descriptive information is available in the NIR.	The TERT recommends that Slovakia includes in future submissions descriptive information and the magnitude of all significant recalculations for key categories.	No	No
Yes	1.A. Stationary combustion CO_2, Solid fuels 2005–2010	The reporting of emissions from iron and steel production is not transparent in the CRF and NIR. From the NIR it is not clear how emissions from integrated iron and steel production are accounted for and how Slovakia ensures that no omission or double-counting of emissions occur. In response to a question raised by the TERT during the review, Slovakia provided information on methods for estimating and allocating emissions between the energy sector and the industrial processes sector.	The TERT recommends that Slovakia increases transparency by including such information in its next submission. In addition, including information on the accounting of feedstocks and non-energy use of fuels for solid fuels would further improve transparency. .	No	No
Yes	1.A.1.b. Petroleum	Slovakia reports significantly higher energy consumption for liquid fuels and gaseous fuels in the CRF than to	The TERT recommends that Slovakia deducts in future submissions the equivalent non-energy use of fuels and	No	No

[5] The GHG emission estimate for this category was revised by Slovakia during the technical review.

[6] 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 ([5])	Technical correction ([6])
	refining Liquid fuels 2005, 2008–2010	EUROSTAT for 2005–2010. For example in 2010, 41 PJ liquid fuels and 24 PJ gaseous fuels were reported in the CRF category 1.A.1.b whereas EUROSTAT includes only 12 PJ liquid fuels and 5 PJ gaseous fuels for the sector B101307 Oil refineries. Eurostat values are available on the website http://epp.eurostat.ec.europa.eu/portal/page/portal/energy/data/database. During the review, Slovakia provided information indicating that Slovakia deducts all carbon from non-energy use of fuels and feedstocks by CRF category, but that the equivalent energy consumption is not deducted accordingly.	feedstocks from the energy consumption in the CRF table in order to improve transparency and comparability with other Member States' GHG inventories.		
Yes	1.A.1.c. Manufacture of solid fuels and other energy industries CO_2, Solid fuels 2005–2010	The CO_2 IEF is very high for solid fuels in CRF 1.A.1.c. and in 1.A.1.a. for other fuels, e.g. 2008 (almost 500 t CO_2/TJ). In May, Slovakia provided a resubmission including recalculated emissions and IEFs for other fuels. In addition, in response to a question raised by the TERT during the review, Slovakia explained that the remaining high CO_2 IEF for solid fuels in 1.A.1.c. is due to the use of blast furnace gas.	The TERT recommends that Slovakia, for key categories, includes, in its next NIR, information on underlying activity data and EFs to explain inter-annual variations in IEFs or EFs that differ from the IPCC default values in line with the 2000 IPCC GPG.	No	No
Yes	1.A.3. Transport 1.A.2. Manufacturing industries 1.A.4. Other sectors All gases	Emissions from off-road vehicles and machinery are not included in the inventory.	It is recommended that Slovakia estimates emissions from off-road vehicles and machinery and reports them. If this cannot be done, it is recommended that Slovakia explores national energy data, determines in what categories energy use for off-road vehicles and machinery is included and reports on this in its next submission.	No	No

Key category	Gas, fuel, activity	Observation	Recommendation	Revised estimate ([5])	Technical correction ([6])
	All years				
No	1.A.3.a. Civil aviation All gases All years	Slovakia estimates the share of emissions from international aviation based on expert judgement and on information on landing and take-off (LTO) cycles and fuel consumption. The same percentage is applied for jet kerosene and aviation gasoline for all years. Given the rapid increase of emissions for aviation (national and international) in Slovakia, the TERT does not believe that applying the same percentage for all years is appropriate.	The TERT recommends that Slovakia estimates the share of international/domestic aviation for each year separately, recalculates emissions from domestic aviation and international aviation and reports the results in the next inventory.	No	No
Yes	1.A.3.b. Road transportation CO_2 gasoline 2005	The IEF for CO_2 from gasoline has fluctuated somewhat for all years since 1990 and the IEF for CO_2 from diesel increased in 2007. Also, AD given in CRF is inconsistent with AD provided in the NIR. According to the IPCC guidelines emissions of CO_2 should be based on the carbon content so fluctuations and shifts like this are unlikely to be accurate. In Slovakia, emissions are estimated using the COPERT model, but calibration with fuel statistics and separation of amount of biofuels seems to be inaccurate.	The TERT recommends that Slovakia ensures that emissions from blended amounts of biofuels are reported separately and accurately and that information given in CRF is consistent with information given in the NIR.	No	No
No	1.A.3.d. Navigation All gases All years	The section on transport has not been updated in the NIR of the 2012 submission, which significantly reduces transparency.	The TERT strongly recommends that Slovakia updates all sections of the NIR.	No	No
No	1.A.3.e. Other transportation	Emissions from military aviation are reported in CRF category 1.A.3.e., but according to the IPCC guidelines	The TERT recommends that Slovakia reallocates these emissions in order to improve the comparability of the	No	No

Key category	Gas, fuel, activity	Observation	Recommendation	Revised estimate ([5])	Technical correction ([6])
	All gases All years	these emissions should be reported under CRF category 1.A.5.b.	inventory.		
No	1.A.4.b. Residential Biomass 2005, 2008–2010	The CRF category 1.A.4.b. includes much more biomass use than the EUROSTAT sectoral approach (SA) (differences are between 15 and 45 PJ). During the review Slovakia explained that CRF data are based on survey statistics while EUROSTAT data is based on modelling.	The TERT recommends that Slovakia investigates the reasons for the large differences in the results between the survey statistics and the modelling and reports on this in its next submission.	No	No
Yes	1.A.4.b. Residential CO2 Gaseous 2008	The CO_2 IEF for natural gas is the same for all subcategories 1.A.4.a-c all years except 2008 where the CO_2 IEF is higher for 1.A.4.b (56.95 t/TJ) compared to 1.A.4.a and 1.A.4.c (54.75 t/TJ). In response to a question raised by the TERT during the technical review, Slovakia provided corrected revised estimates for 2008. The revised estimates resulted in a decrease of CO_2 emissions of 116.29 Gg.	The TERT recommends that Slovakia uses the correct EF for gaseous fuel in category 1.A.4.b in 2008 and reports revised estimates in future inventories.	Yes	No
Yes	1.B.2. Oil and natural gas CO_2, CH_4, N_2O All years	During the centralised review, the TERT noted that several EFs related to the production of oil and gas were chosen as the upper range of the default values provided in the 2000 IPCC Good Practice Guidance (GPG). Slovakia explained that this choice was made as a consequence of a previous UNFCCC review. Furthermore, the TERT enquired about the origin of different activity data for the calculation of fugitive emissions. In response, Slovakia provided a spreadsheet with corresponding calculations. The TERT noted that for the choice of EFs, a reference was made to a study in	The TERT recommends that Slovakia provides further explanations on its calculation of fugitive emissions from oil and gas production in its next submission of the GHG inventory. Especially, the choice of EFs and activity data should be justified.	No	No

Key category	Gas, fuel, activity	Observation	Recommendation	Revised estimate ([5])	Technical correction ([6])
		2005.			
No	Energy: Country-specific issues Liquid 2005–2010	Large amounts (about 14 000 TJ in 2010) of refinery feedstocks are reported to EUROSTAT but not in the CRF 1.A(b). In response to a question raised by the TERT during the review, Slovakia explained that the methodology used for the reference approach estimation is based on balance of carbon in primary fuels and that the methodology is consistent with the methodology of the Statistical Office. The TERT considered this explanation not to be sufficiently clear.	The TERT recommends that Slovakia investigates whether data reported to EUROSTAT include information that could improve the reporting of data in the CRF. The TERT also recommends that Slovakia reconciles the data reporting between EUROSTAT and the CRF.	No	No
No	2.A.7.a. Glass production CO_2 2005–2010	The EF for glass production varies considerably due to different amounts of carbonate materials used in different years for glass production. With the additional explanations provided by the country during the review, the variation in EFs became more transparent.	The TERT recommends that Slovakia adds further explanations in the NIR on the varying amounts of carbonate consumption ($MgCO_3$, K_2CO_3 and $CaCO_3$) in different plants that explains the variation in EFs for glass production.	No	No
Yes	2.B.1. Ammonia production CO_2 2009, 2010	The IEF for CO_2 for ammonia production increased in 2009 and again in 2010 to 2.07 t CO_2/T NH3 after being at a relative constant level around 1.7 for previous years. In response to a question raised by the TERT during the review, Slovakia explained that the increase in the IEF for ammonia production was due to a malfunction of one plant that led to a higher EF during the shutdown and re-starting of the plant.	The TERT recommends that Slovakia adds this explanation for the change of the IEF in the NIR.	No	No
Yes	2.B.4. Carbide production CO_2	In the NIR (page 129) it is explained that calcium carbide exported is subtracted from calcium carbide produced and that the emissions are estimated from the	The TERT recommends a clarification of the explanations in the NIR related to the emission estimates from carbide production.	No	No

Key category	Gas, fuel, activity	Observation	Recommendation	Revised estimate [5]	Technical correction [6]
	All years	remaining calcium carbide consumption. However, according to IPCC methodologies, CO_2 emissions arise from the production process of CaC_2 and not from the consumption; therefore exported CaC_2 should not be subtracted. In response to a question raised by the TERT during the review, Slovakia explained that the emissions from thermal decomposition of limestone and reduction of CaO with carbon are calculated from the production of calcium carbide. However, emissions from using calcium carbide are calculated only from the non-exported production.			
Yes	2.C.1. Iron and steel production CO_2 2005–2010	The NIR does not mention if data from EU ETS are used for the inventory preparation and/or QA/QC activities. In response to a question raised by the TERT during the review, Slovakia explained that EU ETS data are used for the inventory preparation (mass of inputs and outputs of raw materials and products and contents of carbon in all inputs and outputs). In addition, other data are taken from the NEIS database and the result is then compared with EU ETS data from the plant. The TERT considers that the use of EU ETS data is a complex issue, which is common to many sectors/categories. Therefore, a general chapter, which provides general information about the availability and use of EU ETS data, would improve the transparency of this issue.	The TERT recommends that Slovakia includes in the NIR a general chapter about the availability and use of EU ETS data (e.g. as part of the QA/QC chapter or in any other appropriate place).	No	No
No	4.B.9. Poultry CH_4	Slovakia reports a very high share of liquid systems for poultry. As a tier 1 method is used, this does not affect	The TERT recommends that Slovakia checks and revises its AWMS distribution for poultry.	No	No

Key category	Gas, fuel, activity	Observation	Recommendation	Revised estimate ([5])	Technical correction ([6])
	2005, 2008–2010	the calculation of emission estimates.			
Yes	4.D.1.2. Animal manure applied to Soils 4.D.3.1. Atmospheric deposition N_2O All years	The amount of nitrogen spread on agricultural soils (after deduction of the volatilisation) reported in Table 4.Ds1 was not clear to the TERT. On the basis of the Excel spreadsheet provided by Slovakia during the technical review, the TERT was able to check this issue. Actually, the calculation is based on $Frac_{GASM}$, but the value used is 0.3 and not 0.24 as reported in the CRF, and 0.2 is used in the calculation of indirect emissions from volatilisation. This means that if the correct value is 0.24 or 0.2 (IPCC default), this leads to an underestimation of emissions.	The TERT recommends that Slovakia investigates the use of the value 0.3 in the calculation of the emissions from manure spreading although 0.24 is reported in $Frac_{GASM}$ and 0.2 is used in calculating indirect emissions from redeposition. The TERT recommends that Slovakia uses this value consistently in the inventory.	No	No
Yes	4.D.1.2. Animal manure applied to soils N_2O, AD All years	From the NIR it seems that a wrong equation from the Revised 1996 IPCC Guidelines is used by Slovakia for manure volatilisation (paragraph 6.6.3.2 in the NIR) whereas the 2000 IPCC GPG should be used (equation 4.23). In response to a question raised by the TERT during the review, Slovakia provided an Excel spreadsheet illustrating the calculations. On the basis of this spreadsheet the TERT concluded that the equation provided in the NIR on animal manure provided to soil is not used, and that the actual equation implemented in the spreadsheet is consistent with the 2000 IPCC GPG.	The TERT recommends that Slovakia corrects the NIR in order to be consistent with the calculations made for the inventory.	No	No
Yes	6.A. Solid waste disposal on land CH_4, MCF	Slovakia calculates emissions from managed and unmanaged landfills together. For this purpose, the recommended IPCC tier 2 equation has been adapted	The TERT encourages Slovakia to calculate emissions from managed and unmanaged landfills separately in order to improve transparency.	No	No

Key category	Gas, fuel, activity	Observation	Recommendation	Revised estimate [5]	Technical correction [6]
	All years	(MCF(x) has been substituted by MCF (t)) in order to take into account the fact that 'within relatively short time disposal practices changed toward controlled landfills'.			
Yes	6.A.1. Managed waste disposal on land CH_4 recovery All years	No detailed information is provided in the Slovak NIR concerning the methodology applied to estimate CH_4 recovery. Slovakia provided clarifications during the review.	The TERT recommends that Slovakia improves the transparency of the NIR concerning the estimation of CH_4 recovered on landfills. When direct data from landfills are used, the completeness of the reporting should be presented and recalculations made for undocumented sites (closed landfills, not reporting) should be explained. The type of monitored parameters used for this estimation should be indicated (amount of CH_4/biogas recovered, flared or valorised (in mass or energy units), energy generation, etc.). If monitored data is not available in terms of amounts of CH_4 or biogas, but only in energy units (e.g. TJ, electricity/heat generation), the parameters used for the conversion of energy data to CH_4 amounts (e.g. efficiency of the energy plants, NCV, on-site energy use) should be well documented.	No	No
Yes	6.A.3. Other CH_4 recovery All years	CH_4 emissions from organic industrial waste disposed in solid waste disposal sites are calculated and reported separately from CH_4 emissions from municipal solid waste (6.A.1./6.A.3.). However, these categories of waste are disposed in the same solid waste disposal sites. Therefore, CH_4 recovery data concerns both	The TERT encourages Slovakia to use the notation key IE for CH_4 recovery of 6.A.3. in CRF Table 6.A,C.	No	No

Key category	Gas, fuel, activity	Observation	Recommendation	Revised estimate ([5])	Technical correction ([6])
		categories and is reported under 6.A.1.			
Yes	6.B.2. Domestic and commercial wastewater CH_4 recovery All years	It is indicated in the NIR that during anaerobic stabilisation of sludge, generated biogas is used for energy generation and for co-generation of heat and electricity. The amount of CH_4 recovery is collected and used in the calculation of the emission estimates but it but is neither presented in the NIR nor in the CRF table 6.Bs1. Slovakia provided clarifications on this issue during the review.	The TERT recommends that Slovakia improves on the transparency of the NIR by including the information provided during the review and reports the amount of CH_4 recovery in wastewater treatment plants in CRF Table 6.B.	No	No
No	6.B.3.b. N_2O from human sewage N_2O All years	N_2O emissions from human population are calculated applying the Revised 1996 IPCC Guidelines methodology to total population. N_2O emissions are also estimated from sludge incineration. This approach results in a double-counting of N_2O emissions although it is consistent with the IPCC guidelines.	The TERT encourages Slovakia to avoid this double-counting of emissions by subtracting the nitrogen content in sludge spread/incinerated from the nitrogen content in human sewage.	No	No

Annex 2 – Detailed technical corrections

There are no technical corrections applied to the Slovakia's estimates of emissions.

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 ([7]), as well as data from other international organisations.

[7] Service contract 070307/2009/548866/SER/C4 to the European Commission

Annex 4 – Correspondence references

Date	Reference
17 January 2012	Short NIR submission under the MMD
14 April 2012	Final CRF submission under the MMD, version SVK-2012-v1.3
21, 23 May, 4 June 2012	Initial questions raised by the TERT during the desk review
7, 14 June 2012	Additional questions raised by the TERT during the centralised review
4, 5, 6, 7, 9, 18 June 2012	Responses from Slovakia to TERT questions
21 June 2012	Draft technical corrections from TERT to Slovakia
26 June 2012	Response from Slovakia to TERT draft technical corrections
13 July 2012	Draft review report from TERT to Slovakia
2 August 2012	Response from Slovakia to draft review report
17 August 2012	Final review report to European Commission