United Nations FCCC/ARR/2017/CHE

Framework Convention on Climate Change

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Report on the individual review of the annual submission of Switzerland submitted in 2017*

Note by the expert review team

Summary

Each Party included in Annex I to the Convention must submit an annual greenhouse gas (GHG) inventory covering emissions and removals of GHG emissions for all years from the base year (or period) to two years before the inventory due date (decision 24/CP.19). Parties included in Annex I to the Convention that are Parties to the Kyoto Protocol are also required to report supplementary information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention. This report presents the results of the individual inventory review of the 2017 annual submission of Switzerland, conducted by an expert review team in accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol". The review took place from 28 August to 2 September 2017.

* In the symbol for this document, 2017 refers to the year in which the inventory was submitted, not to the year of publication.

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Contents

Abbreviations and acronyms

2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
AAU	assigned amount unit
AD	activity data
Annex A sources	source categories included in Annex A to the Kyoto Protocol
AR	afforestation and reforestation
Article 8 review guidelines	"Guidelines for review under Article 8 of the Kyoto Protocol"
CaO	calcium oxide
CER	certified emission reduction
CF_4	tetrafluoromethane
CH_4	methane
CKD	cement kiln dust
CM	cropland management
CMP	Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
CO	carbon monoxide
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CPR	commitment period reserve
CRF	common reporting format
EEA	European Environment Agency
EF	emission factor
EMIS	Swiss Emission Information System
EMPA	Swiss Federal Laboratories for Material Testing and Research
ERT	expert review team
ERU	emission reduction unit
ETS	emissions trading system
FM	forest management
FMRL	forest management reference level
FOEN	Swiss Federal Office for the Environment
GHG	greenhouse gas
GM	grazing land management
HFCs	hydrofluorocarbons
HWP	harvested wood products
IE	included elsewhere
IEA	International Energy Agency
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
KP-LULUCF activities	activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol
kt	kilotonne
LULUCF	land use, land-use change and forestry
MgO	magnesium oxide
MSW	municipal solid waste
N	nitrogen
NA	not applicable

NCV	net calorific value
NE	not estimated
NF_3	nitrogen trifluoride
NFI	national forest inventory
NH_3	ammonia
NIR	national inventory report
NMVOC	non-methane volatile organic compound
NO	not occurring
N_2O	nitrous oxide
PFCs	perfluorocarbons
ppm	parts per million
QA/QC	quality assurance/quality control
RMU	removal unit
RV	revegetation
SEF	standard electronic format
SF_6	sulfur hexafluoride
SIAR	standard independent assessment report
t	tonne
UNFCCC	United Nations Framework Convention on Climate Change
UNFCCC Annex I inventory reporting guidelines	"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories"
UNFCCC review guidelines	"Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention"
VS	volatile solids
WDR	wetland drainage and rewetting
Wetlands Supplement	*2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*

I. Introduction[1]

1. This report covers the review of the 2017 annual submission of Switzerland organized by the secretariat, in accordance with the Article 8 review guidelines (decision 22/CMP.1, as revised by decision 4/CMP.11). In accordance with the Article 8 review guidelines, this review process also encompasses the review under the Convention as described in the UNFCCC review guidelines, particularly in part III thereof, namely the "UNFCCC guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention" (decision 13/CP.20). The review took place from 28 August to 2 September 2017 and was coordinated by Ms. Claudia do Valle (secretariat). Table 1 provides information on the composition of the ERT that conducted the review of Switzerland.

Table 1
Composition of the expert review team that conducted the review of Switzerland

Area of expertise	*Name*	*Party*
Generalist	Mr. Michael Gitarskiy	Russian Federation
	Ms. Maria Jose Lopez	Belgium
Energy	Mr. Simon Eggleston	United Kingdom of Great Britain and Northern Ireland
	Mr. Shengmin Yu	China
IPPU	Mr. Domenico Gaudioso	Italy
	Ms. Sina Wartmann	Germany
Agriculture	Ms. Rocio Danica Condor	Italy
	Mr. Christopher John Dore	United Kingdom
LULUCF	Mr. Erik Karltun	Sweden
	Ms. Valentyna Slivinska	Ukraine
Waste	Mr. Excellent Hachileka	Zambia
	Mr. Ole-Kenneth Nielsen	Denmark
Lead reviewers	Mr. Gitarskiy	
	Mr. Yu	

2. The basis of the findings in this report is the assessment by the ERT of the consistency of the Party's 2017 annual submission with the Article 8 review guidelines. The ERT has made recommendations that Switzerland resolve the findings related to issues,[2] including issues designated as problems.[3] Other findings, and, if applicable, encouragements of the ERT to Switzerland to resolve them, are also included.

3. A draft version of this report was communicated to the Government of Switzerland, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

[1] At the time of publication of this report, Switzerland had submitted its instrument of ratification of the Doha Amendment; however, the amendment had not yet entered into force. The implementation of the provisions of the Doha Amendment is therefore considered in this report in the context of decision 1/CMP.8, paragraph 6, pending the entry into force of the amendment.

[2] Issues are defined in decision 13/CP.20, annex, paragraph 81.

[3] Problems are defined in decision 22/CMP.1, annex, paragraphs 68 and 69, as revised by decision 4/CMP.11.

4. Annex I shows annual GHG emissions for Switzerland, including totals excluding and including the LULUCF sector, indirect CO_2 emissions, and emissions by gas and by sector. Annex I also contains background data related to emissions and removals from KP-LULUCF activities, if elected, by gas, sector and activity for Switzerland.

5. Information to be included in the compilation and accounting database can be found in annex II.

II. Summary and general assessment of the 2017 annual submission

6. In accordance with paragraph 76 of the UNFCCC review guidelines and paragraphs 47 and 65 of the Article 8 review guidelines, the ERT has prioritized: the review of issues and/or problems identified in previous review reports or in the initial assessment; recalculations in the latest submission that have changed the emission or removal estimate for a category by more than 2 per cent and/or national total emissions by more than 0.5 per cent for any of the recalculated years; and supplementary information reported under the Kyoto Protocol. Table 2 provides the assessment by the ERT of the annual submission with respect to the tasks undertaken during the desk review. Further information on the issues identified, as well as additional findings, may be found in tables 3, 5 and 6.

Table 2
Summary of review results and general assessment of the inventory of Switzerland

Assessment			*Issue or problem ID#(s) in table 3, 5 and/or 6*[a]
Date of submission	Original submission: 13 April 2017 (NIR), 13 April 2017, Version 7 (CRF tables), 19 April 2017 (SEF tables (SEF-CP2-2016 and SEF-CP1-2016))		
Review format	Desk review		
Application of the requirements of the UNFCCC Annex I inventory reporting guidelines and Wetlands Supplement (if applicable)	1. Have any issues been identified in the following areas:		
	(a) Identification of key categories	No	
	(b) Selection and use of methodologies and assumptions	Yes	E.8, E.20, E.21, E.23, I.12, KL.2
	(c) Development and selection of EFs	No	
	(d) Collection and selection of AD	Yes	L.6, W.3, KL.3, KL.7
	(e) Reporting of recalculations	Yes	I.12, L.8, KL.10
	(f) Reporting of a consistent time series	Yes	L.8
	(g) Reporting of uncertainties, including methodologies	No	
	(h) QA/QC	QA/QC procedures were assessed in the context of the national system	
	(i) Missing categories/completeness[b]	Yes	E.12
	(j) Application of corrections to the inventory	No	

Assessment			*Issue or problem ID#(s) in table 3, 5 and/or 6*[a]
Significance threshold	For categories reported as insignificant, has the Party provided sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines?	Yes	
Description of trends	Did the ERT conclude that the description in the NIR of the trends for the different gases and sectors is reasonable?	Yes	
Supplementary information under the Kyoto Protocol	2. Have any issues been identified related to the national system:		
	(a) The overall organization of the national system, including the effectiveness and reliability of the institutional, procedural and legal arrangements	No	
	(b) Performance of the national system functions	No	
	3. Have any issues been identified related to the national registry:		
	(a) Overall functioning of the national registry	No	
	(b) Performance of the functions of the national registry and the technical standards for data exchange	No	
	4. Have any issues been identified related to reporting of information on ERUs, CERs, AAUs and RMUs and on discrepancies reported in accordance with decision 15/CMP.1, annex, chapter I.E, taking into consideration any findings or recommendations contained in the SIAR?	No	
	5. Have any issues been identified in matters related to Article 3, paragraph 14, of the Kyoto Protocol, specifically problems related to the transparency, completeness or timeliness of reporting on the Party's activities related to the priority actions listed in decision 15/CMP.1, annex, paragraph 24, including any changes since the previous annual submission?	No	
	6. Have any issues been identified related to the reporting of LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as follows:		
	(a) Reporting requirements in decision 2/CMP.8, annex II, paragraphs 1–5	No	
	(b) Demonstration of methodological consistency between the reference level and reporting on FM in accordance with decision 2/CMP.7, annex, paragraph 14	Yes	KL.5
	(c) Reporting requirements of decision 6/CMP.9	No	
	(d) Country-specific information to support provisions for natural disturbances, in accordance with decision 2/CMP.7, annex, paragraphs 33 and 34	No	
CPR	Was the CPR reported in accordance with the annex to	No	G.5

Assessment			*Issue or problem ID#(s) in table 3, 5 and/or 6*[a]
	decision 18/CP.7, the annex to decision 11/CMP.1 and decision 1/CMP.8, paragraph 18?		
Adjustments	Has the ERT applied an adjustment under Article 5, paragraph 2, of the Kyoto Protocol?	No	
	Did the Party submit a revised estimate to replace a previously applied adjustment?	NA	Party does not have a previously applied adjustment
Response from the Party during the review	Has the Party provided the ERT with responses to the questions raised, including the data and information necessary for the assessment of conformity with the UNFCCC Annex I inventory reporting guidelines and any further guidance adopted by the Conference of the Parties?	Yes	
Recommendation for an exceptional in-country review	On the basis of the issues identified, does the ERT recommend that the next review be conducted as an in-country review?	No	
Question of implementation	Did the ERT list a question of implementation?	No	

[a] The ERT identified additional issues and/or problems in all sectors that are not listed in this table but are included in table 3, 5 and/or 6.

[b] Missing categories for which methods are provided in the 2006 IPCC Guidelines may affect completeness and are listed in annex III.

III. Status of implementation of issues and/or problems raised in the previous review report

7. Table 3 compiles all the recommendations made in previous review reports that were included in the previous review report, published on 19 April 2017.[4] For each issue and/or problem, the ERT specified whether it believes the issue and/or problem has been resolved by the conclusion of the review of the 2017 annual submission and provided the rationale for its determination, which takes into consideration the publication date of the previous review report and national circumstances.

Table 3
Status of implementation of issues and/or problems raised in the previous review report of Switzerland

ID#	*Issue and/or problem classification*[a]	*Recommendation made in previous review report*	*ERT assessment and rationale*
General			
G.1	Key category analysis– (G.5, 2016) (G.5, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Include indirect CO_2 emissions in the key category analysis.	Resolved. Indirect CO_2 emissions are included in the Party's key category analysis and the results are presented in the NIR (p.44).

[4] FCCC/ARR/2016/CHE.

ID#	*Issue and/or problem classification*[a]	*Recommendation made in previous review report*	*ERT assessment and rationale*
G.2	Uncertainty analysis– (G.6, 2016) (G.6, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Include indirect CO_2 emissions in the uncertainty analysis.	Resolved. Indirect CO_2 emissions are included in the Party's uncertainty analysis and the results are presented in the NIR (pp.50–56).
G.3	Uncertainty analysis– (G.7, 2016) (G.7, 2015) Transparency	Improve transparency and explain in the NIR how the results of the uncertainty analysis are used to improve the inventory.	Resolved. Switzerland explained in the NIR (section 1.6.1.4, p.54) how the results of the uncertainty analysis are used to improve the inventory. Based on the analysis of the predominant contributions to the uncertainty of the Swiss GHG inventory, the FOEN commissions or supports various projects for the categories that are the most important contributors to the level of uncertainty.
Energy			
E.1	International bunkers and multilateral operations – liquid fuels – CO_2, CH_4 and N_2O (E.8, 2016) (E.8, 2015) Transparency	Report transparently the recalculations of liquid fuel consumption and associated GHG emissions from international bunkers.	Resolved. NCVs for kerosene and gas/diesel oil have been updated in the model. The discrepancies between CRF tables 1.D and 1.A(b) for jet kerosene for international aviation bunkers have been resolved. Minor discrepancies for gas/diesel oil for international marine bunkers could be explained as being due to the rounding of AD and/or NCVs.
E.2	1.A.1.a Public electricity and heat production – other fuels – CO_2 (E.9, 2016) (E.9, 2015) Transparency	Include in the NIR additional information to justify the application of 0.99 as the oxidation factor of the combustion of MSW in waste incineration power plants.	Resolved. Justification has been provided in the NIR (section 3.2.5.2.1).
E.3	1.A.1.a Public electricity and heat production – other fuels – CH_4 (E.10, 2016) (E.10, 2015) Transparency	Either estimate and include in the inventory CH_4 emissions from waste incineration based on the EMPA study (2013), or report emissions as "NE" instead of "NA" and provide a justification in the NIR, consistent with the UNFCCC Annex I inventory reporting guidelines, that these emissions are considered insignificant.	Addressing. The Party claimed in the NIR (section 3.2.5.2.1) as well as during the review that emissions of CH_4 do not occur in waste incineration plants according to a study conducted by EMPA in 2013. In the study EMPA evaluated measurements that were performed in 2011 at five Swiss MSW incineration plants with different nitrogen oxides reduction techniques (e.g. selective catalytic reduction and selective non-catalytic reduction). The study showed that CH_4 emissions from waste incineration were mostly below the detection limit of 0.3 ppm, and the study concluded that CH_4 emission concentrations were very low and below the background concentration of 1.8 ppm. Switzerland report these emissions as "NA", but the ERT considers that CH_4 emissions from waste incineration should be reported as "NE" together with the explanation that these

ID#	Issue and/or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
			emissions are insignificant.
E.4	1.A.1.b Petroleum refining, 1.A.4 Other sectors, 1.B.2.a Oil – all fuels – CO_2, CH_4 and N_2O (E.11, 2016) (E.11, 2015) Transparency	Improve the reporting of the level of the tier approach that is applied for petroleum refining (category 1.A.1.b), other sectors (category 1.A.4) and oil transport (category 1.B.2.a) in the NIR.	Resolved. In the NIR (sections 3.2.5.2.2, 3.2.7.2 and 3.3.3.2) the correct tier has been reported for the methodology used to estimate emissions for categories 1.A.1.b, 1.A.4 and 1.B.2.a, respectively.
E.5	1.A.2.a Iron and steel – limestone use – CO_2 (E.12, 2016) (E.12, 2015) Completeness	Either estimate and include in the inventory the CO_2 emissions associated with limestone use in cupola furnaces, or report these emissions as "NE", indicate in the documentation box that they are considered insignificant and provide a justification in the NIR, consistent with the UNFCCC Annex I inventory reporting guidelines, that these emissions are considered insignificant.	Resolved. Switzerland reported CO_2 emission estimates for limestone use in cupola furnaces under category 2.A.4.d (other uses of carbonates), as explained in the NIR (sections. 3.2.6.2.2 and 4.2.2.4). See also ID# I.14 in table 6.
E.6	1.A.2.d Pulp, paper and print – biomass – CH_4 and N_2O (E.13, 2016) (E.13, 2015) Completeness	Estimate and report CH_4 and N_2O emissions from biomass used as fuel in cellulose production in the period 1990–2008.	Resolved. CH_4 and N_2O emissions from biomass fuel used in cellulose production in the period 1990–2008 have been estimated and reported in CRF table1.A(a)s2. The NIR (section 3.2.6.5) documents the recalculations.
E.7	1.A.2.f Non-metallic minerals – biomass – CH_4 (E.14, 2016) (E.14, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Change the reported notation key for CH_4 emissions from biomass used as fuel in non-metallic minerals from "NO" to "IE" for the years 1990–1999 and explain where the emissions are reported.	Addressing. The notation key has been changed as recommended. The NIR (section 3.2.6.2.7) explains that all CH_4 emissions from biomass used as fuel in non-metallic minerals (cement production) are reported under "other fossil fuels". However, still missing is explanatory information in CRF table 9.
E.8	1.A.3.b Road transportation – biomass – CO_2, CH_4 and N_2O (E.15, 2016) (E.15, 2015) Accuracy	Estimate accurately CO_2, CH_4 and N_2O emissions from biodiesel used in road transportation.	Addressing. The Party explained in the NIR (sections 3.2.9.6 and 10.4) as well as during the review that a general update of the parameters, EFs and AD is ongoing for the road transportation model, whereby the error will be corrected and the updated results will be presented in the 2018 or, latest, 2019 annual submission.
E.9	1.A.3.b.i Cars, 1.A.3.b.ii Light-duty trucks – gasoline and diesel – N_2O (E.16, 2016) (E.16, 2015)	Explain the calculation of N_2O emissions from cold start in road transportation (for passenger cars (1.A.3.b.i) and light-duty vehicles (1.A.3.b.ii)) in the NIR.	Resolved. A brief description has been added in the NIR (section 3.2.9.2.2). The Party estimated N_2O cold-start excess emissions for passenger cars and light-duty vehicles for 1990, 2014 and 2015 using EFs from the COPERT model as documented in the EMEP/EEA guidebook (EEA, 2013, p.91 ff.). For the years

ID#	*Issue and/or problem classification*[a]	*Recommendation made in previous review report*	*ERT assessment and rationale*
	Transparency		1991–2013 the emissions for 1990 and 2014 were interpolated linearly.
E.10	1.A.3.b.ii Light-duty trucks – diesel – N_2O (E.17, 2016) (E.17, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Change the reported notation key for N_2O emissions from diesel from "NO" to "NA" for the years 1990–1995.	Resolved. Numerical values are reported for N_2O emissions from diesel for light-duty trucks for the years 1990–1995 in CRF table 1.A(a)s3. The method used to estimate N_2O emissions is consistent with the 2006 IPCC Guidelines.
E.11	1.B.2.b Natural gas – natural gas – CO_2 and CH_4 (E.18, 2016) (E.18, 2015) Accuracy	Recalculate CO_2 and CH_4 emissions from natural gas production for the years 1990–1994 using EFs in line with the 2006 IPCC Guidelines.	Resolved. CO_2 and CH_4 emissions from natural gas production for the years 1990–1994 have been recalculated using default EFs from the 2006 IPCC Guidelines, as described in the NIR (section 3.3.4.2).
E.12	1.B.2.c Venting and flaring – natural gas – CO_2, CH_4 and N_2O (E.19, 2016) (E.19, 2015) Completeness	Estimate and report CO_2, CH_4 and N_2O emissions from flaring of natural gas using a methodology consistent with the 2006 IPCC Guidelines.	Not resolved. During the review the Party informed the ERT that CO_2, CH_4 and N_2O emissions for category 1.B.2.c.ii (flaring of natural gas) were estimated for the period 1990–1994 using default EFs from the 2006 IPCC Guidelines (only one production plant was in operation through 1994), and a short description was provided in the NIR (section 3.3.5.2). However, the emissions have not yet been included in the CRF tables (the Party still reported "NE" in CRF table 1.B.2). The Party confirmed that this will be corrected in the next annual submission.
IPPU			
I.1	2. General (IPPU) – CO_2 (I.3, 2016) (I.3, 2015) Transparency	Improve the transparency of the reporting of indirect CO_2 emissions from the IPPU sector by including detailed information on the AD and methodology used for the estimation.	Addressing. The Party improved the description of the methodology used to estimate indirect CO_2 emissions in the NIR (see sections 4.4.2.1, 4.4.2.2 and 9.2.1). However, the description is still insufficient to understand thoroughly the methodology used by the Party.
I.2	2. General (IPPU) – HFCs, PFCs and SF_6 (I.4, 2016) (I.4, 2015) Transparency	Improve the description of the role of the data from Jungfraujoch research station as a provider of verification data, not the input data for the inventory.	Resolved. The Party has substantially revised the description of the project at Jungfraujoch on the basis of the previous recommendation, clarifying that the information provided by the project is used as independent verification of the emission estimates provided in the GHG inventory and not as a replacement for input data (see NIR annex 5.1).
I.3	2.C.1 Iron and steel production – CO_2 (I.5, 2016) (I.6, 2015) Comparability	Either reallocate process emissions from iron processing in cupola furnaces from category 1.A.2.a to category 2.C.1 iron and steel production, or, if that split is not possible, report these emissions as "IE" under category 2.C.1 and	Resolved. Switzerland explained that, since other bituminous coal first of all acts as fuel in cupola furnaces, and because it was not possible to split the part that acts as fuel and as carburization material and reductant, it was decided to report the CO_2 emissions under category 1.A.2.a (iron and steel) (see NIR

ID#	*Issue and/or problem classification*[a]	*Recommendation made in previous review report*	*ERT assessment and rationale*
		explain where they are reported.	sections 3.2.6.2.2 (p.130) and 4.4.2.1 (p.221)). See also ID# I.14 in table 6.
I.4	2.C.3 Aluminium production – CO_2 (I.6, 2016) (I.6, 2015) Transparency	Explain in the NIR how indirect CO_2 emissions from aluminium production are estimated and how it is ensured that there is no double counting of emissions between the direct and indirect CO_2 emissions.	Resolved. Relevant information was provided in the NIR (section 4.4.2.2).
I.5	2.C.3 Aluminium production – PFCs (I.7, 2016) (I.7, 2015) Transparency	Include in the NIR, to the extent possible, more detailed information on the analysis of the measurements resulting in a lower EF for PFC emissions from aluminium production.	Not resolved. Switzerland explained that the aluminium production company closed in 2007 and that no additional information was found in the archives. However, the ERT is of the view that the Party could improve the information in the NIR (section 4.4.2.2) without providing any new assessment; for example, by simply including more information on the analysis of the measurements, including the comparison between measured values and the values for the European and global averages.
I.6	2.C.3 Aluminium production – HFCs, PFCs and SF_6 (I.8, 2016) (I.8, 2015) Transparency	Correct the description of the allocation of SF_6 emissions from aluminium foundries in 2005 in the NIR to ensure consistency with the CRF tables.	Resolved. The description of the allocation of SF_6 emissions from aluminium foundries has been placed under category 2.C.3 in order to ensure consistency with the CRF tables (see NIR section 4.4.2.2).
I.7	2.E.1 Integrated circuit or semi-conductor – PFCs (I.9, 2016) (I.9, 2015) Transparency	Explain in detail how PFC emissions (especially CF_4 emissions) from integrated circuits or semiconductors originate, including which species are converted into other species.	Resolved. The Party has revised the information provided in CRF table 2(II)B-Hs1 for category 2.E.1. The quantities reported in the previous submission as recovery in CRF table 2(II)B-Hs1 for this category for all gases were not correct and have now been reported as "NA". The reported emissions are now lower than the consumption values for all gases.
I.8	2.F.1 Refrigeration and air conditioning – HFCs and PFCs (I.10, 2016) (I.10, 2015) Accuracy	Exclude Liechtenstein when estimating HFC and PFC emissions from commercial and industrial refrigeration for the period 1991–2007.	Resolved. The Party has revised the entire time series of import data for refrigeration and air conditioning in order to exclude the consumption by Liechtenstein (see NIR sections 4.7.2.1 and 4.7.5).
I.9	2.F.1 Refrigeration and air conditioning – HFCs and PFCs (I.11, 2016) (I.11, 2015) Comparability	Continue efforts to acquire statistical data to allow the reporting of emissions to be split between industrial and commercial refrigeration, or, if this is not possible, report the appropriate notation key "IE" for HFC and PFC emissions from industrial refrigeration with the information that emissions from that category are reported under commercial refrigeration.	Addressing. The Party informed the ERT that efforts are ongoing to acquire additional statistical data, but so far the data quality is insufficient. In CRF table 2(II)B-Hs2, information is provided in the documentation box that "2.F.1 industrial refrigeration is included under commercial refrigeration"; however, the notation key "IE" has not been reported for the gases HFC and PFC under industrial refrigeration (row 25 of the CRF table).
I.10	2.F.1 Refrigeration and air conditioning	Improve the description of the assumptions made in the estimates	Resolved. In section 4.7.2 of the NIR the description of the model has been improved

ID#	*Issue and/or problem classification*[a]	*Recommendation made in previous review report*	*ERT assessment and rationale*
	– HFCs and PFCs (I.12, 2016) (I.12, 2015) Transparency	for HFC and PFC emissions from refrigeration and air conditioning (2.F.1), especially for parameters that are not within the range given by the 2006 IPCC Guidelines.	and the justification for the lower EFs provided. Annex 3.2 to the NIR gives an illustrative example of the model structure and parameters used for calculating emissions from mobile air conditioning in cars.
Agriculture			
A.1	3. General (agriculture) – N_2O (A.3, 2016) (A.3, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Correct the information on methodologies and EFs for N_2O emissions from manure management and agricultural soils in CRF table summary 3s2 to make it consistent with the EFs and methodologies actually used in the estimations.	Addressing. Switzerland updated CRF table summary 3s2 to include use of country-specific EFs, but some inconsistencies remain. The entries in CRF table summary 3s2 for reporting the tier method used for estimating N_2O for categories 3.B and 3.D should be further amended to be consistent with the text in the NIR (sections 5.3.2.1 and 5.5.2.1). Therefore, the method in CRF table summary 3s2 for N_2O for category 3.B should be reported as tier 2, and the method for N_2O for category 3.D should be reported as country-specific tier 2.
A.2	3.B.4 Other livestock – CH_4 (A.6, 2016) (A.6, 2015) Transparency	Provide relevant supporting information in the NIR for the choice of the VS value used to estimate CH_4 emissions from manure management of horses.	Resolved. The value for VS excretion has been changed to 1.90 kg/head/day on the basis of equation 10.24 from the 2006 IPCC Guidelines. A detailed explanation is provided in the NIR (section 5.3.2.2.1).
A.3	3.D.a.4 Crop residues – N_2O (A.7, 2016) (A.7, 2015) Transparency	Provide in the NIR relevant explanations for the assumptions used to estimate nitrogen input from crop residues on pastures.	Resolved. A detailed explanation is provided in the NIR (section 5.5.2.2.2).
A.4	3.D.a.5 Mineralization/immobilization associated with loss/gain of soil organic matter – N_2O (A.8, 2016) (A.8, 2015) Transparency	Provide in the NIR a clear indication of the usage of net carbon losses to estimate direct N_2O emissions from mineralization of soil organic matter.	Resolved. A detailed explanation is provided in the NIR (section 5.5.2.2.2).
A.5	3.G Liming – CO_2 (A.9, 2016) (A.9, 2015) Accuracy	Estimate CO_2 emissions from liming taking into account the limestone and dolomite used.	Resolved. Total lime application has been split into separate limestone and dolomite components (see NIR section 5.8).
LULUCF			
L.1	Land representation – (L.6, 2016) (L.6, 2015) Transparency	Clarify in the NIR that all land is managed, or provide the definition of managed and unmanaged land and their areas over time.	Addressing. Switzerland included in the NIR (section 6.2.1, p.338) a clear definition of managed land, which states that all land except other land is considered managed. However, the NIR (section 6.1.3.1, p.329) also contains a statement that is ambiguous in relation to this issue: “In Switzerland, all land is considered to be managed”. Switzerland clarified during the

ID#	Issue and/or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
			review that only other land is considered unmanaged. The Party indicated that it will clarify this issue in the next NIR.
L.2	Land representation – (L.7, 2016) (L.7, 2015) Transparency	Improve the description of the identification of the country-specific combination categories (i.e. land use and land-use change categories that are more detailed than those defined in the 2006 IPCC Guidelines) in order to increase the transparency of the information on the identification of IPCC land-use categories.	Not resolved. Switzerland stated in the NIR (section 6.3.6, p.349) that the description of the identification of the country-specific combination categories and subdivisions will be improved, but did not give an indication of when this improvement will be made.
L.3	Land representation – (L.8, 2016) (L.8, 2015) Transparency	Use the term "afforestation" in the NIR only when referring to a conversion from land to forest land that corresponds to the Swiss definition for afforestation activities under Article 3, paragraph 3, of the Kyoto Protocol as defined in its report to facilitate the calculation of its assigned amount pursuant to Article 3, paragraphs 7 and 8, for the first commitment period of the Kyoto Protocol.	Resolved. Switzerland clarified that when the term "afforestation", which is used to name a subcategory of land converted to forest, is used in its reporting under the Convention it is consistently written with a lower case letter. When "Afforestation" refers to the KP-LULUCF category it is consistently written with an upper-case letter. It also made clear that the definition of land for the two categories is identical (i.e. the subcategory afforestation for reporting under the Convention has the same definition as land under Afforestation for KP-LULUCF).
L.4	4. General (LULUCF) – CO_2 (L.9, 2016) (L.9, 2015) Transparency	Report transparently the definition of organic soils to estimate and report the carbon stock changes in organic soils.	Resolved. Switzerland provided a country-specific definition of organic soils in the NIR (section 6.2.2, p.341).
L.5	4. General (LULUCF) – CO_2 (L.10, 2016) (L.10, 2015) Transparency	Improve the transparency of the description of the equations used for calculations in the NIR by clarifying the meaning of areas ($A_{i,ba}$) used in the equations (i.e. whether the area used in the calculations ($A_{i,ba}$) is the total area of the subcategory (which is the sum of the areas converted in the last 20 years) or whether it is the area converted in the inventory year).	Resolved. Switzerland provided clarification in the NIR (section 6.1.3.2, p.332) of the meaning of the areas ($A_{i,ba}$) used in the equations and how the time period is considered.
L.6	4.A Forest land – CO_2 (L.11, 2016) (L.11, 2015) Accuracy	Identify the areas of drained organic soils in forests accurately by collecting data on areas of organic soils under forest land affected by past draining activities.	Not resolved. Switzerland has indicated in the NIR (section 6.4.6, p.382) that data on the share of organic soils affected by past draining activities under forest land will be collected for the next annual submission, using additional descriptive information from the NFI surveys.
L.7	4.A.1 Forest land remaining forest land – CH_4 and N_2O (L.13, 2016) (L.13, 2015)	Explain in the NIR the reallocation of CH_4 and N_2O emissions from open burning of residues in forests from category 5.C.2 (open burning of waste) in the waste sector to	Resolved. Switzerland has provided an explanation for the reallocation of CH_4 and N_2O emissions from category 5.C.2 to category 4(V).A.1 in the NIR (section 6.4.2.13, p.374).

ID#	*Issue and/or problem classification*[a]	*Recommendation made in previous review report*	*ERT assessment and rationale*
	Transparency	category 4(V).A.1 (controlled burning in forest land remaining forest land) (CRF table 4(V) biomass burning under the LULUCF sector).	
Waste			
W.1	5.A Solid waste disposal on land – CH_4 (W.7, 2016) (W.7, 2015) Transparency	Report the correct tier for the methodology used to estimate CH_4 emissions from solid waste disposal on land in CRF table summary 3s2 and in the NIR.	Addressing. Switzerland has good-quality country-specific AD and well-documented historical data, and estimates emissions using the IPCC first order decay method with default parameters. The Party has updated the NIR (section 7.2.2, p.421), indicating the use of a tier 2 method as per the previous recommendation, but it has not updated CRF table summary 3s2 accordingly.
W.2	5.A Solid waste disposal on land – CH_4 (W.8, 2016) Transparency	Explain in more detail the assumptions, AD and methodologies used to estimate landfill with gas recovery both for electricity production and for other purposes.	Resolved. Switzerland included in the NIR (section 7.2.2, p.424) information on the source of AD and methodology used to estimate landfill with gas recovery both for electricity production and for other purposes.
W.3	5.B.1 Composting – CH_4 (W.9, 2016) (W.8, 2015) Accuracy	Since emissions from the biological treatment of solid waste (5.B) is a key category, review and, if necessary, revise the AD for composting and demonstrate that they are accurate by providing supporting documentation in the NIR.	Not resolved. Switzerland included this recommendation in its planned improvements in the NIR (section 7.3.6). The new AD will be fed into the 2018 annual submission.
W.4	5.B.2 Anaerobic digestion at biogas facilities – CH_4 (W.10, 2016) (W.9, 2015) Transparency	Explain in more detail in the NIR how the country-specific EF for CH_4 losses from biogas facilities was obtained.	Resolved. Switzerland included in its NIR (section 7.3.2.2, p.428) an explanation of how the country-specific EF for CH_4 was obtained and table 7-12 presents the EFs used. According to the Party, the EF for losses of CH_4 from biogas upgrading is based on official regulations regarding maximum CH_4 leakage as well as studies focusing on CH_4 emissions from biogas upgrading.
W.5	5.C Incineration and open burning of waste – CH_4 and N_2O (W.11, 2016) (W.10, 2015) Transparency	Provide a more detailed explanation of the source, data acquisition and references for the AD, by type of waste, used to estimate CH_4 and N_2O emissions from incineration and open burning of waste.	Resolved. Switzerland included the required information in the NIR (section 7.4.2, p.434). The Party provided information on hospital, industrial, sewage and illegal municipal waste incineration as well as on open burning of natural residues and cremations.
W.6	5.C.2 Open burning of waste – CH_4 and N_2O (W.12, 2016) (W.11, 2015) Transparency	Identify in the NIR the definition of natural agricultural residue waste as a country-specific type of waste in Switzerland or national waste, as allowed by the definition of MSW in the 2006 IPCC Guidelines.	Resolved. The Party provided in the NIR (section 7.4.1) the required information as additional text, explaining that natural agricultural and gardening residues consist of fallen fruit trees, part of diseased residue which are cut up, collected and burned off site.

ID#	*Issue and/or problem classification*[a]	*Recommendation made in previous review report*	*ERT assessment and rationale*
W.7	5.C.2 Open burning of waste – CH_4 and N_2O (W.13, 2016) (W.12, 2015) Transparency	Explain the reallocation of CH_4 and N_2O emissions from open burning of residues from forests in the NIR.	Resolved. The reallocation of CH_4 and N_2O emissions from open burning of waste was addressed in the revised estimates submitted in response to the review of the 2017 annual submission, as detailed in annex 7 to the NIR. The Party indicated in the NIR (section 6.1.2, p.327 and section 11.5.2.3, p.509) that controlled burning of residues was for the first time reported under the LULUCF sector and in CRF table 4(V).
W.8	5.C.2 Open burning of waste (biogenic) (W.14, 2016) (W.13, 2015) Transparency	Correct the AD reported in CRF table 5.C for open burning of waste for natural residues and ensure consistency between the NIR and the CRF tables for these AD.	Addressing. Switzerland corrected the AD in NIR table 7-17 (p.434) and CRF table 5.C. However, the values in NIR table 7-17 are split into agriculture and private households while those in the CRF table 5.C are aggregated. The ERT is of the view that the Party could include a footnote to NIR table 7-17 explaining the differences between the values in the NIR and the CRF table 5.C.
KP-LULUCF			
KL.1	General (KP-LULUCF) – Gen (KL.3, 2016) (KL.3, 2015) Transparency	Address the transparency issues in ID#s L.6, L.7, L.9, L.10 and L.12 from the 2016 ARR and provide the necessary information in relation to KP-LULUCF activities.	Addressing. For Switzerland's response to this recommendation, see the ERT assessment and rationale under IDs# L.1, L.2, L.4 and L.5 above. (L.12 (2016/2015) refers to an encouragement and is not included in this table 3). For the two resolved issues from the previous review (see IDs# L.4 and L.5 above), the necessary information in relation to KP-LULUCF was indicated by referencing in section 11 of the NIR the relevant parts of section 6, and the ERT found this sufficient.
KL.2	Afforestation and reforestation, and deforestation – CO_2 (KL.4, 2016) (KL.4, 2015) Accuracy	Review the assumption that only 50 per cent of the difference between the carbon stocks before and after the change is reported as a source or sink, respectively, for afforestation (from settlements to forest land) and deforestation (from forest land to settlements) and, if necessary, revise the estimates for these KP-LULUCF activities.	Not resolved. Switzerland reported in the NIR (sections 6.8.6, p.406, and 11.5.2.3, p.508) that "a revision of the assumption that only 50% of the difference between the carbon stocks before and after the change is reported as a source or sink" is included as a category-specific planned improvement.
KL.3	Deforestation – CO_2 (KL.5, 2016) (KL.5, 2015) Accuracy	Address ID# L.11 in the 2016 ARR and, if necessary, revise the estimates for deforestation.	Not resolved. The Party has not resolved the previous recommendation to identify the areas of drained organic soils in forests accurately by collecting data on areas of organic soils under forest land affected by past draining activities. See the ERT assessment and rationale under ID# L.6 above.
KL.4	Forest management – CH_4 and N_2O (KL.6, 2016) (KL.6, 2015)	According to ID# L.13 in the ARR 2016, explain in the NIR the estimation of CH_4 and N_2O emissions from open burning of	Addressing. Switzerland provided an explanation for the reallocation of CH_4 and N_2O emissions from category 5.C.2 to category 4(V).A.1 in the NIR (section 6.4.2.13, p.374) in

ID#	*Issue and/or problem classification*[a]	*Recommendation made in previous review report*	*ERT assessment and rationale*
	Transparency	residues in forests and the allocation to the category controlled burning in CRF table 4(KP-II)4 (GHG emissions from biomass burning for forest management).	response to ID# L.7 above. The Party provided a short explanation about this reallocation under the section "technical correction forest management reference level" in its NIR (section 11.5.2.3, p.509) but without including any cross reference to NIR section 6.4.2.13 where the calculations and methods applied were reported.
KL.5	Forest management – CH_4 and N_2O (KL.6, 2016) (KL.6, 2015) Adherence to reporting guidelines under Article 7, paragraph 1, of the Kyoto Protocol	According to ID# L.13 in the ARR 2016, include the reallocated values in the FMRL, applying a technical correction if necessary.	Not resolved. Switzerland explained in the NIR (section 11.5.2.3) that it decided not to provide technical corrections of the FMRL on an annual basis, but to correct the FMRL periodically and therefore the next technical correction will be made for the 2019 inventory submission. The Party listed in the NIR (p.509) all the improvements which will be made to the technical correction of the FMRL.
KL.6	Forest management – CO_2 (KL.7, 2016) (KL.7, 2015) Accuracy	Report the correct values for both the FMRL and the technical correction in the CRF table accounting.	Resolved. The recommendation was addressed by reporting the correct values for both the FMRL and the technical correction in CRF table 4(KP-I)B.1.1.
KL.7	Harvested wood products – CO_2 (KL.8, 2016) (KL.8, 2015) Accuracy	Estimate and report carbon stock changes for the product category paper using either the national or the internationally available data, or provide transparent justification in the NIR as to why the available information on AD for paper is not transparent and verifiable.	Not resolved. Switzerland has added the issue to the list of planned improvements in the NIR (section 6.11.6, p.414). A study on how to determine domestic pulp in production of recycled paper will be carried out.
KL.8	Harvested wood products – CO_2 (KL.9, 2016) (KL.9, 2015) Transparency	Increase the transparency of the reporting by correctly reporting the amount of exported HWP in CRF table 4(KP-I)C instead of using "NA", or by entering the notation key "IE" if exported HWP are included in the total HWP production.	Resolved. Switzerland has changed the notation key from "NA" to "IE" for exported HWP in CRF table 4(KP-I)C.
KL.9	Harvested wood products – CO_2 (KL.10, 2016) (KL.10, 2015) Transparency	Increase the transparency of the explanation in the NIR to clarify that exports of roundwood are excluded from the calculations following equation 2.8.1.	Resolved. Switzerland has included a clarification in the NIR that exported roundwood is not included in the calculations using equation 2.8.1 (section 6.11.2, p.411).

[a] References in parentheses are to the paragraph(s) and the year(s) of the previous review report(s) where the issue and/or problem was raised. Issues are identified in accordance with paragraphs 80–83 of the UNFCCC review guidelines and classified as per paragraph 81 of the same guidelines. Problems are identified and classified as problems of transparency, accuracy, consistency, completeness or comparability in accordance with paragraph 69 of the Article 8 review guidelines, in conjunction with decision 4/CMP.11.

IV. Issues identified in three successive reviews and not addressed by the Party

8. In accordance with paragraph 83 of the UNFCCC review guidelines, and as documented in table 4, the ERT has assessed that there are no issues identified in three successive reviews that have not been addressed by the Party.

Table 4
Issues identified in three successive reviews and not addressed by Switzerland

ID#	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed*[a]
General		
	No such general issues were identified	
Energy		
	No such issues for the energy sector were identified	
IPPU		
	No such issues for the IPPU sector were identified	
Agriculture		
	No such issues for the agriculture sector were identified	
LULUCF		
	No such issues for the LULUCF sector were identified	
Waste		
	No such issues for the waste sector were identified	
KP-LULUCF		
	No such issues for KP-LULUCF activities were identified	

[a] The review of the 2016 annual submission was held in conjunction with the review of the 2015 annual submission. Since the reviews of the 2015 and 2016 annual submissions were not "successive" reviews, but were held in conjunction, for the purpose of counting successive years in table 4, 2015/2016 are considered as one year.

V. Additional findings made during the 2017 individual inventory review

9. Tables 5 and 6 contain findings made by the ERT during the individual review of the 2017 annual submission of Switzerland that are additional to those identified in table 3. In accordance with paragraph 76(b) of the UNFCCC review guidelines, the ERT has prioritized in table 5 recalculations that changed the total emissions/removals for a category by more than 2 per cent and/or national total emissions by more than 0.5 per cent for any of the recalculated years.

Table 5
Additional findings made during the 2017 individual review of the annual submission of Switzerland related to recalculations

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
General			
G.4	Recalculations	Switzerland described in the NIR (section 10.3) the implications of recalculations for the emission trends. It provided data for the years 1990 and 2014 showing the change of the emission trend owing to recalculations between the previous and the current inventory submissions. More information was provided within the sectoral chapters of the NIR, and an extensive list with all detailed recalculations and specifics of the recalculations compiled by EMIS experts was made available to the ERT during the review week. The ERT concludes that the impact of recalculations on the emission trend for 1990–2014 cannot be assessed with the information provided in the NIR on the base year and the inventory year only. If this information is confidential, the Party could provide the consistency of the recalculated trends for 1990–2014, in the form of indices for instance. The ERT recommends that the Party provide in the NIR information on recalculations for the whole time series.	Yes. Transparency
Energy			
E.13	1.A.4 Other sectors – gaseous fuels – CO_2	Switzerland reported in the NIR (section 3.2.7.5, p.148) that recalculations of the CO_2 EF for natural gas resulted in a change to the emission level of –13 kt CO_2 eq for 2014 and 2 kt CO_2 eq for 1990 for stationary sources under category 1.A.4 (other sectors), and referred to section 3.2.4.9 (category 1.A, p.113) for the explanation. Section 3.2.4.9 explains that for the recalculations the CO_2 EF for natural gas was linearly interpolated between 1995 and 2000, and that the CO_2 EF was changed for the years 2009, 2010 and 2014. In addition, the Party also reported that small recalculations were done due to the rounding of AD for 2013 and 2014 in the Swiss overall energy statistics. However, the ERT noted that there was no explanation in the NIR for the recalculation of the CO_2 EF for natural gas for 1990. The ERT also noted that the recalculations made for the time series are not above the threshold (i.e. have not changed the emission/removal estimate for a category by more than 2 per cent and/or national total emissions by more than 0.5 per cent). During the review, the Party informed the ERT that the CO_2 EF for natural gas for 1990 remained unchanged and that the recalculation for 1990 for category 1.A.4 was caused by the recalculation of the fugitive emissions from the distribution grid to households, which is accounted as CH_4 emissions under category 1.B.2.b (natural gas). The corresponding amount of gas is subtracted from gas consumption under category 1.A.4.b (residential) in order to avoid double counting. The ERT noted that the difference owing to recalculation for category 1.B.2.b should reduce estimated emissions by –2 kt CO_2 eq for 1990 and not increase them as reported in the NIR. The Party confirmed that CO_2 emissions as reported for category 1.A.4.b for the year 1990 in the 2016 annual submission were higher (25 876 GJ natural gas, 1,452 kt CO_2 emissions) than in the 2017 annual submission (25,841 GJ natural gas, 1,450 kt CO_2 emissions), and	Not an issue/problem

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
		therefore the recalculation resulted in a change of –2 kt CO_2 eq for 1990 for stationary sources under category 1.A.4.	
E.14	1.A.5.b Mobile – liquid fuels – N_2O	The ERT noted that in CRF table 8s1 recalculations were reported for N_2O emissions for category 1.A.5 (other) that resulted in a change that exceeds the threshold (2 per cent) for 2013, 2014 and other earlier years. However, in the NIR (p.181) it was stated that no category-specific recalculations were carried out for category 1.A.5.b (mobile), which is the only subcategory reported by Switzerland under category 1.A.5. During the review the Party confirmed that indeed there was a recalculation owing to a change in the N_2O EF for kerosene to the IPCC default EF of 2 g/GJ (before it was 2.33 g/GJ).	Not an issue/problem
E.15	1.B.2.b Natural gas – natural gas – CH_4	Switzerland reported in the NIR (section 3.3.4.5, p.189) that for categories 1.B.2.b.4 (transmission and storage) and 1.B.2.b.5 (distribution) the recalculations for CH_4 emissions for the period 1990–2014 were carried out due to the update of the employed calculation tool, with minor corrections of individual natural gas loss rates, minor corrections of AD from the Swiss gas network as well as minor changes to the polynomial interpolations for years with insufficient data from the gas network available. The ERT noted that these recalculations resulted in a change for the period 1990–2013 that exceeds the threshold (2 per cent). In addition, the NIR (p.188) stated that, for some (earlier) years in the time series, sufficient input data were not available to calculate the gas losses. For those years, polynomial interpolations were applied to assess the AD. However, the Party has not provided in the NIR a detailed description of the updates, minor corrections to the employed calculation tool or minor changes to the polynomial interpolations, nor of how those minor corrections resulted in a recalculation change that exceeds the 2 per cent threshold. The ERT recommends that the Party ensure that the next recalculations for the energy sector are reported in a comprehensive and transparent manner.	Yes. Transparency
IPPU			
I.11	2. General (IPPU) – CO_2 and HFCs	Recalculations were made for the IPPU sector that changed the emission/removal estimate for CO_2 in category 2.C.3 (aluminium production) and for HFCs in category 2.G.4 (other product manufacture and use – other) by more than 2 per cent and/or national total emissions by more than 0.5 per cent; however, the ERT did not identify any issues or problems with the recalculations.	Not an issue/problem
I.12	2.G.4 Other (other product manufacture and use) – CO_2	For this category, no recalculations changed the emission/removal estimate for a category by more than 2 per cent and/or national total emissions by more than 0.5 per cent. However, according to the Party (NIR, section 4.8.5, p.263), during the recalculations, a double counting of NMVOC emissions from de-icing of aeroplanes for the years 1990–2006 was identified, which will be corrected for the 2018 annual submission. Since the NMVOC emissions are used to calculate indirect CO_2 emissions, the ERT recommends that, in the next submission, the Party provide a correct time series for NMVOC emissions from de-icing of aeroplanes and update the respective indirect CO_2 emissions reported in CRF table 6 and in the national totals.	Yes. Accuracy

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
Agriculture			
A.6	3. General (agriculture) – CH_4 and N_2O	Recalculations were made in the agriculture sector for categories 3.D.a.5 (mineralization/immobilization associated with loss/gain of soil organic matter), 3.D.b.1 (atmospheric deposition) and 3.D.b.2 (nitrogen leaching and run-off) that changed the emission/removal estimate for each of these categories by more than 2 per cent and/or national total emissions by more than 0.5 per cent; however, the ERT did not identify any issues or problems with the recalculations.	Not an issue/problem
LULUCF			
L.8	4.A.1 Forest land remaining forest land – CO_2	The ERT noted that Switzerland has recalculated its data for CO_2 emissions/removals from forest land remaining forest land. The recalculations resulted in a considerable decrease in the removals of CO_2. In the 2017 submission the values for CO_2 (net emissions and removals) in 2014 for the category were lower by 749.35 kt (–44.75 per cent) compared with in the 2016 submission, which represents a change of 1.4 per cent of the national total emissions for Switzerland. The recalculation affects the years from 2006 onward, resulting in a pronounced shift in the time series between 2005 and 2006 and remaining more or less quantitatively constant for all years thereafter. During the review, Switzerland explained that the recalculation was due to the inclusion of the most recent NFI data (NFI4) for the period 2011–2015 (see NIR, sections 6.4.2.1 and 6.4.5). Switzerland further explained that changes in gains and losses of living biomass are calculated based on the differences between two NFIs, in this case NFI 3 and NFI 4, thereby affecting the values since 2005. The fact that the difference remains more or less constant for the years after 2006 shows that the calculation is internally consistent. During the review, Switzerland also referred to the background document Thürig et al. (2017) which shows and explains in a very detailed way all changes occurring as a result of using NFI 4 (2011–2015). The Party also clarified that the publication year for Thürig et al. (2015) in the reference list to the NIR (p.618) should be 2017 and informed the ERT that it will be corrected in the next submission. The ERT is of the view that the quantity of the change and its effect on the time series, described above, raises questions regarding time-series consistency for the category. The ERT recommends that Switzerland ensure that the time series is consistent in accordance with the 2006 IPCC Guidelines, or justify the validity of the reason behind the substantial inter-annual change in the time series for CO_2 emissions/removals from forest land remaining forest land between 2005 and 2006; and explain why this introduction of data from NFI4 only affects the time period from 2006 onward by, for example adding to the NIR the information giving during the review and provided in Thürig et al. (2017).	Yes. Consistency
Waste			
W.9	5. General (waste) – CO_2, CH_4 and	No recalculations made in the waste sector changed the emission/removal estimate for a category by more than 2 per	Not an issue/problem

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
	N_2O	cent and/or national total emissions by more than 0.5 per cent.	
Other			
O.1	Sector 6 (other) – all fuels – CO_2, CH_4 and N_2O	The ERT noted that in CRF table 8s3, recalculations for sector 6 (other) for the year 2014 resulted in a change of –18.7 per cent for CO_2 emissions, –17.0 per cent for CH_4 and –21.7 per cent for N_2O. However, the explanation in the NIR did not reveal the underlying cause for such vast differences owing to the recalculations. During the review, the Party informed the ERT that: (a) for fire-damaged motor vehicles, AD for motor vehicles in the 2016 submission were assessed for the years 1990–2002 and then left constant at the value for 2002 (i.e. 610 t) for 2003 onward, and for the 2017 submission the time series has been updated with vehicle data up to 2015 and AD increased to a value of 750 t, which resulted in a significant change; and (b) for fire-damaged estates, for the 2016 submission, the amount of material burned for the respective process was estimated using statistical insurance data for the years 1992–2001. The resulting value of 8 kt was used for the whole time series and not estimated on a year-to-year basis. For the 2017 submission Switzerland decided to update the time series with statistical data from the insurance association, which are now available for the years 1996–2015. As a result, the AD now vary on a year-to-year basis (between 6.3 kt and 8 kt) over that time period. This resulted in a large percentage change and led, in sum with fire-damaged motor vehicles, to the detected decreases in emissions. The ERT welcomes the Party's efforts in estimating and reporting emissions from fire-damaged estates and motor vehicles under sector 6 (other) and recommends that the Party ensure that any recalculations are reported transparently in the NIR.	Yes. Transparency
KP-LULUCF			
KL.10	Forest management – CO_2	The ERT noted that the recalculation issue described in ID# L.8 above affects the KP-LULUCF reporting. The ERT recommends that Switzerland report the recalculations in relation to KP-LULUCF activities at the same time as the Party clarifies in the NIR the reason behind the substantial inter-annual change in the time series for CO_2 emissions/removals from forest land remaining forest land between 2005 and 2006 and explains why the introduction of data from NFI4 is only affecting the time period from 2006 onward (see ID# L.8 above).	Yes. Transparency

[a] Recommendations made by the ERT during the review are related to issues as defined in paragraph 81 of the UNFCCC review guidelines, or problems as defined in paragraph 69 of the Article 8 review guidelines. Encouragements are made to the Party to address all findings not related to such issues or problems.

10. Table 6 contains additional findings made by the ERT during the 2017 individual review that are not covered in table 3 or 5, but are within the scope of the desk review as specified in paragraph 76 of the UNFCCC review guidelines or paragraph 65 of the Article 8 review guidelines and are findings that the ERT wishes to convey to the Party.

Table 6
Additional findings made during the 2017 individual review of the annual submission of Switzerland

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
General			
G.5	Commitment period reserve	The ERT noted that Switzerland reported the commitment period reserve in NIR (section 12.5 p.515) as 325,591.674 kt CO_2 eq calculated as 90 per cent of the assigned amount. However, according to the review report of the report to facilitate the calculation of the assigned amount for the second period of the Kyoto Protocol (FCCC/IRR/2016/CHE) the correct value calculated as 90 per cent of the assigned amount is 325,591.672 kt CO_2 eq. The ERT further noted that a similar situation occurs for the assigned amounted, the correct value of which is 361,768.524 kt CO_2 eq. The ERT recommends that Switzerland report the correct value of the commitment period reserve in future annual submissions.	Yes. Reporting under Article 7, paragraph 1, of the Kyoto Protocol
G.6	QA/QC and verification	Concerning QA procedures and the information provided in the NIR (p.34), the ERT noted that expert peer reviews are part of the annual QA procedures of the Party but no expert peer reviews have been undertaken since 2013. During the review, the Party explained that the expert peer reviews are discussed annually in the GHG inventory core group and, in 2014, it was decided that no expert peer review should take place until the revised UNFCCC Annex I inventory reporting guidelines were fully implemented. After that, owing to the substantial problems with the new CRF Reporter software in the first two years of its implementation, the core group decided that resources should be allocated to dealing with the pending submissions rather than with expert peer reviews. The core group discussed potential areas for future peer reviews during its spring meeting in 2017. It was decided that future expert peer reviews should target specific categories rather than entire sectors in order to make best use of the available resources and expertise. Expert peer review activities will take place from 2017 onward and the results of the reviews will be presented in future inventory submissions. The ERT commends Switzerland for implementing expert peer reviews from 2017 onward and encourages the Party to continue doing so on an annual basis as part of its QA/QC system.	Not an issue/problem
G.7	Uncertainty analysis	The Party included indirect CO_2 emissions in the key category and uncertainty analyses for the first time for the 2017 inventory submission. According to the NIR (section 9.2.3), uncertainties of indirect CO_2 emissions are taken from the Party's informative inventory report (FOEN, 2017) for CO and NMVOCs. The indirect emissions of CO_2 from CO and NMVOCs are calculated according to the 2006 IPCC Guidelines (volume 1, chapter 7.2.1.5, box 7.2). This calculation assumes that CO and NMVOCs will be oxidized to CO_2. The ERT noted that the uncertainty related	Not an issue/problem

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
		to this assumption is not accounted for in the uncertainty analysis. During the review, the Party confirmed that the uncertainty of this estimation is not included in the analysis owing to a lack of reliable data on the uncertainty of the oxidation factors. The ERT encourages the Party to estimate the uncertainty of indirect CO_2 emissions by taking into account the oxidation of atmospheric pollutants in order to increase the accuracy of its estimates.	
G.8	Key category analysis	The ERT noted that the key category analysis performed by the Party using approach 1 and 2 results in different categories contributing more than 10 per cent to the level assessment (NIR, p.40 for approach 1 and p.45 for approach 2). For example, under approach 1 (table 1-4) categories 1.A.3.b (CO_2) – gasoline, 1.A.3.b (CO_2) – diesel and 1.A.4.b (CO_2) – liquid fuels each contribute more than 10 per cent to the level assessment, whereas under approach 2 (table 1-7) categories 4.A.1 (CO_2) and 3.D.a (N_2O) are the two categories contributing more than 10 per cent to the level assessment. However, the reasons for the differences are not transparently detailed in the NIR. During the review the Party informed the ERT that the uncertainty of each category is provided in the NIR (annex A2.1, table A2). The ERT encourages the Party to include in its NIR an explanation of any differences in the results of the key category analysis using approach 1 and approach 2, and how such a comparison contributes to prioritizing efforts for the continuous improvement of the inventory.	Not an issue/problem
Energy			
E.16	1. General (energy sector) – solid fuels – CO_2	Table A-33 (NIR, p.565) indicates that there are some imports and consumption of anthracite and coke oven coke in Switzerland (e.g. 7 Gg anthracite and 18 Gg coke oven coke in 2010). The NIR (p.83) also states that other bituminous coal (anthracite) is used as feedstock in the Swiss production plant for silicon carbide and graphite in category 2.B.5 (carbide production). However, the ERT noted that the notation key "NO" was used for reporting anthracite and coke oven coke in CRF tables 1.A(b) and 1.A(d). During the review, the Party informed the ERT that the Swiss overall energy statistics distinguish only between other bituminous coal and lignite, without further disaggregation. "NO" was chosen for the reporting of anthracite and coke oven coke in CRF tables 1.A(b) and 1.A(d) as they are not listed in the data files that the inventory team receives from the Swiss Federal Office of Energy. The Party also notified that, as shown in annex 4 to the NIR, the coal consumption reported to IEA and in the reference approach agree at an aggregated level. Therefore, in view of the apparent disaggregation in the reporting to IEA, the Party agreed that it could use "IE" instead. The ERT recommends that the Party make efforts to acquire statistical data to allow disaggregating AD and GHG emissions for anthracite and coke oven coke use, or, if this is not possible, change the reported notation key for anthracite and coke oven coke in CRF tables 1.A(b) and 1.A(d) from "NO" to "IE" for the years 1990–2015, with a description in the NIR and CRF table 9 that anthracite and coke oven coke have been aggregated under other	Yes. Comparability

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem?[a] If yes, classify by type
		bituminous coal.	
E.17	Fuel combustion – reference approach – gaseous fuels – CO_2	The NIR (p.186) states that there was a single natural gas production plant operating in Switzerland during the years 1985–1994 (see ID#s E.11 and E.12 in table 3). The ERT notes that CRF table 1.B.2 reported a numerical value for natural gas production for the years 1990–1994, for example 0.13 PJ for 1990. Nevertheless, "NO" was reported for natural gas production in CRF table 1.A(b) for the years 1990–1994. During the review, the Party confirmed that in the reference approach (CRF table 1.A.b) all natural gas was reported as imported, including the natural gas from domestic production. Therefore, natural gas production in Switzerland in the period 1990–1994 was included in both the sectoral and the reference approach; however, it was reported in the wrong column for the reference approach (under import instead of production). The ERT recommends that the Party report the amount of natural gas production under the column "production" instead of under "import" for the years 1990–1994 in CRF table 1.A(b).	Yes. Comparability
E.18	1.A.2 Manufacturing industries and construction – biomass – CO_2, CH_4 and N_2O	Switzerland explained in the NIR (p.133) that, because no comprehensive information exists to distribute biomass consumption to the specific industries within category 1.A.2 (manufacturing industries and construction), biomass is reported under category 1.A.2.g.viii (other). However, the ERT noted that in CRF table1.A(a)s2 values for biomass consumption were reported for category 1.A.2.d (pulp, paper and print) for 1990–2008, and for 2009 onward the notation key "NO" was reported. The ERT also noted that consumption of biomass was reported for categories 1.A.2.f (non-metallic minerals) and 1.A.2.g.iv (wood and wood products). During the review, the Party informed the ERT that biomass consumption data were available for category 1.A.2.d between 1990 and 2008 and are related to the biomass used in the cellulose production plant, which closed in 2008. According to the Party, currently there is no comprehensive information available to distribute biomass consumption to specific industries, except for biomass used in cement production and fireboard production, which has already been reported under categories 1.A.2.f and 1.A.2.g.iv, respectively. Therefore, biomass used in category 1.A.2 that could not be allocated to any other specific source category was reported under category 1.A.2.g.viii. In addition, the Party explained that the amount of biomass that could not be allocated was most probably used in categories 1.A.2.d (pulp, paper and print), 1.A.2.e (food processing, beverages and tobacco), 1.A.2.f (non-metallic minerals) and 1.A.2.g.iv (wood and wood products). The ERT recommends that the Party make efforts to acquire statistical data to allow the reporting of GHG emissions from biomass split between categories 1.A.2.d, 1.A.2.e, 1.A.2.f and 1.A.2.g.iv. Where this is not possible, report the appropriate notation key "IE" instead of "NO" and indicate in the CRF table 9 (completeness table) that emissions for the relevant categories are reported under category 1.A.2.g.viii.	Yes. Comparability
E.19	1.A.3.b Road transportation –	The Party reported in the NIR (pp.83, 84, 92 and 159) that fuel sold in Switzerland but consumed abroad ('fuel tourism') is accounted for in Switzerland's GHG inventory and reported under category 1.A.3.b.viii. However, the	Yes. Transparency

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
	liquid and gaseous fuels – CO_2, CH_4 and N_2O	ERT could not find category 1.A.3.b.viii in CRF table 1.A(a)s3, nor find fuel tourism reported under category 1.A.3.b.v (other). During the review the Party informed the ERT that the description in the NIR is incorrect, that fuel tourism is treated as a separate category in the EMIS database (1.A.3.b.viii) and that, when data are exported to the CRF Reporter, the data for fuel tourism are added to category 1.A.3.b.i (cars) if the fuel is gasoline, and to category 1.A.3.b.iii (heavy-duty trucks and buses) if the fuel is diesel. The ERT recommends that the Party correct the description of the allocation of fuel tourism and associated emissions in the NIR to explain that data for fuel tourism are added to category 1.A.3.b.i (cars) if the fuel is gasoline and to category 1.A.3.b.iii (heavy-duty trucks and buses) if the fuel is diesel.	
E.20	1.A.3.b Road transportation – liquid and gaseous fuels – N_2O	Switzerland reported in the NIR (p.162) that the cold-start N_2O EFs for 2015 are 0.011 kg/TJ (for passenger cars – gasoline) and 0.025 kg/TJ (for light-duty vehicles). However, in the NIR (p.160) the Party also provided the equation for estimating start emissions with the number of starts as AD. During the review, the Party explained that cold-start emissions for air pollutants and GHGs (except N_2O) were calculated by means of an EF in g/cold start, as stated in the NIR (p.160). Cold-start excess emissions of N_2O were previously not calculated because they were considered not to be relevant. However, owing to a recommendation made by the ERT during the review in 2016 (see E.9 in table 3), Switzerland provided estimations for N_2O cold-start emissions for the 2017 annual submission applying the latest version of the COPERT model, as suggested by the previous ERT. The COPERT method deviates from the Swiss method: it connects the cold-start excess emissions to the fuel consumption and not to the number of starts. Therefore, the EFs in the NIR (p.162) are given in kg/TJ. The ERT notes that, in the NIR (p.160), a corresponding reference to the exception for the N_2O modelling was not provided. The Party informed the ERT that, for the next submission, the cold-start excess emissions for each air pollutant or GHG will be integrated into the Swiss road transportation model. The ERT welcomes Switzerland's efforts and recommends that the Party estimate cold-start excess emissions of N_2O using the Swiss road transportation model and describe in NIR the method and assumptions used.	Yes. Accuracy
E.21	1.A.3.b.ii Light-duty trucks – gaseous fuels – CO_2, CH_4 and N_2O	Switzerland reported in the NIR (p.162) that an inconsistency in the attribution of natural gas to the vehicle categories led to an error in the IEFs for gas-driven light-duty vehicles, and that the error will be corrected for the next submission. No further information was provided in the NIR. During the review, the Party explained that the consumption of natural gas (as compressed natural gas) in road transportation started in 2005 but the road transportation model at that time did not contain any other fuel types than gasoline and diesel oil. The model was only extended in 2010, and the first reporting of natural gas consumption in category 1.A.3.b happened in the 2011 NIR (section 3.2.9, p.139). Because the penetration of bifuel (compressed natural gas/gasoline) light-duty vehicles in the Swiss vehicle fleet happened slowly and only very few bifuel light-	Yes. Accuracy

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		duty vehicles were in operation in 2010, an error in the dynamical fleet model that affects the accuracy of the AD for bifuel light-duty vehicles was not detected. The error was only detected when the IEF for compressed natural gas of light-duty vehicles was reported for the first time in the 2015 NIR. The Party also stated that a full update of the road transportation model is ongoing and the error will be corrected. The ERT welcomes Switzerland's efforts and recommends that the Party correct the error related to the AD for bifuel light-duty vehicles during the ongoing full update of the road transportation model and report the results in the NIR.	
E.22	1.A.3.b.iv Motorcycles – lubricant oil – CO_2, CH_4 and N_2O	Switzerland reported in the NIR (pp.82 and 228) that lubricants are used in a variety of processes, including blending with motorcycle fuel; and that lubricants in engines are primarily used for their lubricating properties, and the associated CO_2 emissions are therefore reported as non-combustion emissions under source category 2.D.1 (lubricant use). The Party also reported (p.82) that 20 per cent of lubricants are oxidized during use. According to the 2006 IPCC Guidelines (volume 2, chapter 3.2.1.4), lubricants intentionally mixed with fuel and combusted in road vehicles should be reported as energy and the associated emissions calculated using mobile source guidelines. During the review, the Party informed the ERT that, after further enquiries with the Swiss Federal Office for Energy regarding the allocation of lubricants in two-stroke gasoline engines in the Swiss overall energy statistics, only the gasoline part of two-stroke oil is allocated to gasoline, while the lubricants are listed under non-energy use of oil products. Therefore, in the Swiss inventory, emissions of CO_2, CH_4 and N_2O from the oxidation of lubricants used in two-stroke engines are not fully estimated owing to the allocation under non-energy use (with the value for oxidation during use of 0.2, i.e. 80 per cent of CO_2 and 100 per cent of CH_4 and N_2O are reported as "NE"). In response to a follow-up question, the Party estimated that the range of total lubricant use in two-stroke engines is 200–500 t in road transportation and 140–250 t in non-road application. However, the emissions not estimated are well below the significance threshold (on the basis of CRF table summary 2, this threshold is 24.08 kt CO_2 eq for Switzerland) in accordance with decision 24/CP.19, annex, paragraph 37(b). The ERT recommends that the Party either provide additional information to justify that the CH_4 and N_2O emissions not estimated due to their current allocation under category 2.D.1 are below the significance threshold as contained in decision 24/CP.19, annex, paragraph 37(b) or estimate the full emissions of CO_2, CH_4 and N_2O for lubricants blended with motorcycle fuel, reporting them under category 1.A.3.b.iv.	Yes. Transparency
E.23	1.A.4.b Residential – biomass – CO_2, CH_4 and N_2O	Switzerland indicated in the NIR (p.147) that the total wood demand for bonfires is assumed to be constant (160 TJ) over time, without providing further information to justify this assumption. However, the ERT noted that the population of Switzerland increased by almost 16 per cent from 1990 to 2015. During the review, the Party explained that the assumption is based on the per capita consumption of wood for bonfires decreasing from 2 kg/capita to 1.5 kg/capita between 1990 and 2015, owing mainly to an increase in the use of gas barbecue grills. However, in response to a follow-up question, the Party informed the ERT that the assumption is based on the	Yes. Accuracy

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
		judgment of the inventory team, and there are no supporting materials for the assumption and no figures available on the use of gas barbecue grills. According to the ERT, a 16 per cent increase in the population (between 1990 and 2015) would have increased the total wood demand, approximately, from 160 TJ to 186 TJ of biomass, resulting in a very small increase in CH_4 emissions and an even smaller increase in N_2O emissions that is below the threshold of significance according to paragraph 37(b) of the UNFCCC reporting guidelines. As the underestimate is below the threshold of significance, it would also be below the threshold for commencement of an adjustment procedure in accordance with paragraph 80(b) of the annex to decision 22/CMP.1, and therefore was not listed as a potential problem. The ERT recommends that the Party justify that the per capita consumption of wood for bonfires decreased from 2 kg/capita to 1.5 kg/capita between 1990 and 2015 (owing mainly to an increase in the use of gas barbecue grills), or revise the estimates of CH_4 and N_2O emissions assuming constant per capita consumptions between 1990 and 2015.	
IPPU			
I.13	2.A.1 Cement production – CO_2	Switzerland reported in the NIR (section 4.2.2, p.199) that data on annual clinker production were provided by the industry association cemsuisse for the period 1990–2007 and that the data for 2008 onward were based on plant-specific annual monitoring reports from the Swiss ETS. However, the ERT noted that the composition of the raw material used for clinker production was not provided in the NIR, and not even in the guidelines of the Swiss ETS (provided to the ERT during the review), which would be needed to assess the correctness of the indicated value (525 kg CO_2/t clinker). During the review, Switzerland explained that the EF of 525 kg CO_2/t clinker used in the Swiss ETS corresponds to the value provided by the report from Cement Sustainability Initiative (2011) (see method B1, p.9). The Party also explained that data from the Swiss cement industry for the years 2008–2011 showed that the CaO content of clinker typically varied between 63 and 66 per cent, while MgO content was around 2 per cent. The Party also explained that, as these contents already contained fractions deriving from non-carbonate sources, it was decided to add a share for non-carbonate carbon and CKD (as described in the above-mentioned report). The Party further explained that for the current submission it was decided to revise the EF in order to establish a consistent time series from 1990 to 2015 and also to achieve consistency between the Swiss ETS and the GHG inventory. In order to facilitate the assessment by the ERT of the correctness of the CO_2 EF for the calcination process, the ERT recommends that the Party summarize in the NIR the information concerning the composition of the raw material and the methodology used to derive the country-specific EF.	Yes. Transparency
I.14	2.C.1 Iron and steel production – CO_2	Switzerland reported CO_2 emission from cupola furnaces in the energy sector under category 1.A.2.a (iron and steel). The Party explained that bituminous coal first of all acts as fuel in cupola furnaces, and because it was not	Yes. Comparability

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		possible to split the part that acts as fuel and as carburization material and reductant, it was decided to report the CO_2 emissions under category 1.A.2.a. However, the ERT noted that according to 2006 IPCC Guidelines (volume 3, chapter 1, box 1.1): "combustion emissions from fuels obtained directly or indirectly from the feedstock for an IPPU process will normally be allocated to the part of the source category in which the process occurs. These source categories are normally 2B and 2C. However, if the derived fuels are transferred for combustion in another source category, the emissions should be reported in the appropriate part of the Energy Sector source categories (normally 1A1 or 1A2)". In addition, the ERT noted that Switzerland reported CO_2 emissions from limestone used in cupola furnaces under category 2.A.4.d (other uses of carbonates). However, according to the 2006 IPCC Guidelines (volume 3, chapter 2, p.2.6), it is good practice to allocate emissions from the use of limestone, dolomite and other carbonates to the industrial source category where they are emitted (e.g. iron and steel production). The ERT recommends that Switzerland, in accordance with the 2006 IPCC Guidelines, allocate CO_2 emissions from bituminous coal and limestone used in cupola furnaces under category 2.C.1.	
I.15	2.E.1 Integrated circuit or semi-conductor – HFCs, PFCs, SF_6 and NF_3	Switzerland reported in the NIR (section 4.6.2, p.238) the methodology used to estimate emissions from the electronics industry and stated that a survey within the electronics industry was carried out for the 2015 annual submission in order to distribute the imported substances to the different categories of electronic industry and to obtain information on waste air treatment. However, the ERT noted that no explanation was provided in the NIR on the approach used to select EFs. The ERT recommends that Switzerland describe in the NIR: the results of the survey carried out among users of the substances about the presence of exhaust treatments; the criteria used to characterize emission abatement at smaller installations for which no information was provided by the survey; and the reason why default EFs were used instead of the consumption and abatement data made available through the survey.	Yes. Transparency
Agriculture			
A.7	3. General (agriculture) – CH_4 and N_2O	The ERT noted that the livestock characterization for category 3.A (enteric fermentation) and 3.B (manure management) provided in NIR tables 5-3 and 5-10 (pp.270 and 284) includes "bison <3 years" and "bison> 3 years" under categories 3.A.4.a and 3.B.4.a (buffalo). However, it was not clear to the ERT whether the term "bison" does refer to bison (*bison bonasus* or *bison bison*) or if these livestock classes should be "buffalo". During the review, Switzerland confirmed that the term "bison" is correctly applied and that these animals are not buffalo. In addition, Switzerland provided data that supported the emission estimation for bison, and informed the ERT that it will report emission estimates for bison under categories 3.A.4 and 3.B.4 (other livestock/other (please specify)) in the future in order to prevent any confusion. However, in response to the draft report, Switzerland informed the ERT that the CRF Reporter does not allow a new category of livestock to be added beyond those	Yes. Transparency

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
		already existing and that will continue to report "bisons" under categories 3.A.4.a and 3.B.4.a (buffalo). The ERT recommends that Switzerland provide a clear definition and description of the animal species reported under 3.A.4.a and 3.B.4.a (buffalo) and include some additional information in the NIR to give a short explanation of the data and assumptions that are used for the corresponding emission calculations.	
A.8	3. General (agriculture) – CH_4 and N_2O	Switzerland provided emission estimates for rabbits under categories 3.A and 3.B. However, the ERT noted that there was no mention in the NIR of fur animals (except for rabbits) and whether emissions from other animal types are "NE" or confirmed as "NO". During the review, Switzerland provided documentation and a reference to a list of national legislation regarding the standards relating to farming fur animals such as mink and foxes, and explained that these prohibit commercial fur-farming. In particular, Switzerland confirmed that this is true for all years from 1990 onward, because provisions for the husbandry of wild animals were already very strict in the first Swiss animal protection law from 1978 and therefore standards were already prohibitive for commercial fur-farming before 1990. In addition, fur animals (other than rabbits) are not included in national livestock data. The ERT recommends that Switzerland explain in the NIR why fur animals (other than rabbits) are not included in the emission estimates under categories 3.A and 3.B and include references to the relevant documentation and national legislation.	Yes. Transparency
A.9	3.B.5 Indirect – N_2O emissions N_2O	Switzerland reported in the NIR (section 5.3.2.1, p.285) that N_2O emissions from category 3.B (manure management) were estimated using a tier 2 methodology, that AD were adjusted to the particular situation of Switzerland in coordination with the Swiss ammonia model AGRAMMON, and that detailed country-specific data on nitrogen excretion rates, manure management system distribution and nitrogen volatilization were applied. The Party also reported that N lost and the resulting indirect N_2O emissions from leaching and run-off from manure management systems under category 3.B.5 (indirect N_2O emissions) were considered negligible and reported as "NO" in CRF table 3.B(b); however, no justification to support this assumption was provided in the NIR. During the review, Switzerland explained that the information provided in the NIR is principally based on the judgment of an expert (Thomas Kupper, from the School of Agricultural, Forest and Food Sciences) who is responsible for the Swiss ammonia model AGRAMMON, and it provided a list of technical articles that justify the expert judgment (that N leaching from animal waste management systems is negligible). However, in response to the draft report the Party informed the ERT that in fact the expert judgment is stating that leaching from manure management is not occurring although the wording "negligible" was used. The ERT recommends that Switzerland provide information in the NIR that supports the expert judgment, clarifying whether N leaching from animal waste management systems is negligible or not occurring, in line with the 2006 IPCC Guidelines (e.g. through the provision of expert judgment protocols, minutes of panels or meetings, reports,	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem?[a] If yes, classify by type
		peer-reviewed articles).	
A.10	3.C.4 Other (rice cultivation) – CH_4	Switzerland reported "NO" for harvested area of upland rice in CRF table 3.C for the whole time series. However, the ERT noted that this is inconsistent with the information provided in the NIR. In the NIR (section 5.1, p.267) the Party reported that "Category 3.C (rice cultivation) does not occur in Switzerland", and in (section 5.4, p.302) the Party reported that "there is only some insignificant upland rice cultivation in the southern part of Switzerland and CH_4 emissions are assumed to be zero". While the ERT recognizes that zero emissions may arise from upland rice, it considers that there is inconsistency in the current reporting and no explanation as to why "NO" was reported for the area of upland rice in CRF table 3.C. During the review, Switzerland explained that the notation key "NO" was reported incorrectly in CRF table 3.C and that although rice cultivation is occurring (approximately 80 ha) there are no associated emissions. The ERT recommends that Switzerland report the harvested area for upland rice in CRF table 3.C instead of the notation key "NO".	Yes. Comparability
A.11	3.D.a.4 Crop residues – N_2O	Switzerland reported in the NIR (p.308) the equation used for estimating N_2O emissions from crop residues. The Party stated in the NIR that "standard values for fresh matter crop yields and N contained in crop residues are given in Flisch et al. (2009) and that for sugar beet and fodder beet it is assumed that 10 per cent of the crop residues are removed from the fields for animal fodder". However, the ERT noted that no comment was included in the NIR on other possible removal terms for crop residues that would reduce the amount of N that is eventually returned to the soil, such as removal of residue material for use as fuel or burned as waste. During the review, Switzerland explained that the use of crop residues for fuel or the (open) burning of crop residues are not common practice in the country and are subject to strong regulations. The ERT recommends that Switzerland explain in the NIR that the use of crop residues for fuel or the (open) burning of crop residues are not common practice in the country and are subject to strong regulations, and therefore not considered to be an activity that reduces the amount of N returned to soil in the country.	Yes. Transparency
A.12	3.D.b.1 Atmospheric deposition – N_2O	Switzerland reported in the NIR (section 5.5.3.2, p.313) that different ammonia loss factors were used for animal manure N applied to soils from different livestock categories according to the detailed approach of the AGRAMMON model, and that an additional source, "volatilization of ammonia from the vegetation cover on agricultural soils and from alpine areas", was accounted for, assuming that 2.0 kg NH_3-N/ha and 0.5 kg NH_3-N/ha are emitted from agricultural land and the alpine area, respectively. However, the ERT noted that the latest version of the EMEP/EEA guidebook (EEA, 2016) (chapter 3.D, section 2.1.1, p.8) does not present a methodology for estimating NH_3 emissions from standing crops and states that it has not yet been possible to develop a robust and usable methodology to calculate these emissions. During the review, Switzerland explained that, irrespective of the information provided in the latest (2016) version of the EMEP/EEA guidebook, it has extensive information from the literature that supports the estimation of NH_3	Not an issue/problem

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
		directly volatilized from vegetation. Switzerland also indicated that a decision on the relevance and correctness of this emission source will be taken when the national agriculture expert group next meet with the GHG inventory group. The ERT encourages Switzerland to review the most up-to-date guidance material in the EMEP/EEA guidebook (currently the 2016 version) and the literature in general, and then review the inclusion of this emission source of NH_3 when estimating N_2O emissions for category 3.D.b.1.	
LULUCF			
L.9	4.A Forest land – CO_2	Chapter 4 of the 2006 IPCC Guidelines includes stumps as part of the biomass and dead organic matter pools. The ERT noted that stumps were not specifically mentioned in the NIR in relation to the methodological description on the quantification of living biomass and dead organic matter. Looking at the methodological reference contained in the NIR (Kaufmann, 2001), it is difficult to understand how stumps are partitioned from the rest of the biomass. Stumps makes up a sizeable portion of trees' biomass. It is important that the methodology for quantification of the stump portion is transparently described, especially since that part of the tree remains after harvest and needs to be transferred to the dead organic matter pool and included, in Switzerland's case, as input in the simulations with the Yasso07 model to determine changes in the soil organic matter pool. During the review Switzerland clarified that stumps were included and referred to as "stock" in table 6-15 of the NIR (p.353). The ERT recommends that Switzerland, in its NIR, improve its description of the quantification of stump biomass and how stumps after cutting are included in the dead organic matter pool and subsequently transferred as input to the Yasso07 model.	Yes. Transparency
Waste			
W.10	5.B.1 Composting – CH_4 and N_2O	Switzerland reported in the NIR (section 7.3.3, p.429) that the uncertainty for category 5.B.1 of the CH_4 EF was estimated at 40 per cent and is unknown for the N_2O EF and therefore a combined uncertainty of 80 per cent was attributed. In response to a question raised by the ERT on why Switzerland did not include in its inventory improvement plan a provision to reduce the uncertainty of CH_4 and N_2O emissions from composting, the Party explained that efforts are under way to assess and improve AD, EFs and their uncertainties for both industrial and private composting, and that it is planned to include a new time series in the 2018 annual submission. The ERT encourages Switzerland to continue its efforts to improve AD and EFs for composting.	Not an issue/problem
W.11	5.C.2 Open burning of waste – CH_4 and N_2O	Switzerland reported in the NIR (section 7.4.1, p.430) that emission estimates for category 5.C.2 cover open burning of branches and garden waste. However, the ERT noted that the estimation methodology and how the data on branches burned were obtained were not clearly explained in the NIR. During the review, the Party explained that the data were obtained from cantonal authority statistics on the number of permitted fires and sanctions due to non-	Yes. Transparency

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
		permitted fires, with the amount of burned material in those cantons quantified; and given that there are a significant number of unreported cases, it was assumed that the actual amount of material burned was three times greater than the amount that has been approved by the authorities. On the basis of the numbers from the evaluated cantons, an extrapolation of the amount burned in Switzerland was made. The ERT recommends that Switzerland describe in the NIR how AD were obtained and which assumptions were made for estimating CH_4 and N_2O emissions from open burning of branches and garden waste.	
W.12	5.D Wastewater treatment and discharge – CH_4	The ERT noted that Switzerland estimated CH_4 emissions from industrial and commercial wastewater together, but no explanation or description of the sources of AD was included in the NIR (section 7.5). The ERT noted that the AD were expressed as the total organically degradable material in domestic and industrial/commercial wastewater. The use of "/" between industrial and commercial makes it ambiguous as to whether industrial and commercial wastewater were treated as the same or emissions from the two were added up. During the review the Party explained that, in general, wastewater from industrial or commercial companies is discharged into the connected public sewer system. Concerning wastewater streams, there is no difference between the terms "industrial" and "commercial". In order to be allowed to discharge wastewater into the public system, companies have to meet legal requirements (maximum allowed load factors for critical pollutants). If the wastewater is heavily polluted, there is the option of an on-site pretreatment, in order to lower the load and to meet the legal requirements of the discharged wastewater or in order to pay a lower discharge fee. The pretreated wastewater is then discharged into the public sewer system. The ERT recommends that Switzerland include in the NIR the explanation of the sources of AD for commercial and industrial wastewater.	Yes. Transparency
KP-LULUCF			
KL.11	General (KP-LULUCF)	No further issues identified.	Not a problem

[a] Recommendations made by the ERT during the review are related to issues as defined in paragraph 81 of the UNFCCC review guidelines, or problems as defined in paragraph 69 of the Article 8 review guidelines. Encouragements are made to the Party to address all findings not related to such issues or problems.

VI. Application of adjustments

11. The ERT has not identified the need to apply any adjustments to the 2017 annual submission of Switzerland.

VII. Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol

12. Switzerland has elected commitment period accounting and therefore the issuance and cancellation of units for KP-LULUCF activities is not applicable for the 2017 review.

VIII. Questions of implementation

13. No questions of implementation were identified by the ERT during the review.

Annex I

Overview of greenhouse gas emissions and removals for Switzerland for submission year 2017 and data and information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as submitted by Switzerland

1. Tables 7–10 provide an overview of total GHG emissions and removals as submitted by Switzerland.

Table 7
Total greenhouse gas emissions for Switzerland, base year[a]–2015
(kt CO_2 eq)

	Total GHG emissions excluding indirect CO_2 emissions		*Total GHG emissions including indirect CO_2 emissions[b]*		*Land-use change (Article 3.7 bis as contained in the Doha Amendment)[c]*	*KP-LULUCF activities (Article 3.3 of the Kyoto Protocol)[d]*	*KP-LULUCF activities (Article 3.4 of the Kyoto Protocol)*	
	Total including LULUCF	*Total excluding LULUCF*	*Total including LULUCF*	*Total excluding LULUCF*			*CM, GM, RV, WDR*	*FM*
FMRL								220.00
Base year	53 065.69	53 344.43	53 476.57	53 755.30	NA		NA	
1990	53 065.69	53 344.43	53 476.57	53 755.30				
1995	48 562.73	52 238.44	48 835.93	52 511.64				
2000	57 370.11	52 352.37	57 556.69	52 538.95				
2010	53 104.50	54 357.65	53 226.90	54 480.05				
2011	49 422.37	50 275.93	49 543.81	50 397.37				
2012	50 353.93	51 613.65	50 473.43	51 733.15				
2013	51 435.69	52 509.07	51 554.33	52 627.71		130.66	NA	–2 484.03
2014	47 772.96	48 608.67	47 891.60	48 727.30		130.90	NA	–1 077.73
2015	47 131.90	48 025.68	47 244.04	48 137.82		133.42	NA	–2 536.44

Note: Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.

[a] Base year refers to the base year under the Kyoto Protocol, which is 1990 for all gases. For activities under Article 3, paragraph 3, of the Kyoto Protocol and FM under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] The Party has reported indirect CO_2 emissions in CRF table 6.

[c] The value reported in this column refers to 1990.

[d] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely AR and deforestation.

Table 8
Greenhouse gas emissions by gas for Switzerland, excluding land use, land-use change and forestry, 1990–2015
(kt CO_2 eq)

	CO_2[a]	*CH_4*	*N_2O*	*HFCs*	*PFCs*	*Unspecified mix of HFCs and PFCs*	*SF_6*	*NF_3*
1990	44 571.19	6 101.67	2 828.89	0.02	116.52	NA, NO	137.01	NA, NO
1995	43 685.64	5 781.88	2 688.49	244.91	17.49	NA, NO	93.23	NA, NO
2000	43 781.76	5 395.22	2 546.06	622.24	49.88	NA, NO	143.79	NA, NO
2010	45 164.09	5 275.50	2 495.23	1 324.31	64.50	NA, NO	147.98	8.45
2011	41 102.00	5 216.59	2 439.24	1 406.07	67.72	NA, NO	159.53	6.22
2012	42 366.13	5 178.81	2 421.98	1 485.68	71.27	NA, NO	208.91	0.36
2013	43 307.54	5 117.82	2 384.05	1 513.82	51.93	NA, NO	252.46	0.09
2014	39 377.25	5 120.24	2 399.64	1 526.90	44.03	NA, NO	258.84	0.40
2015	38 852.17	5 084.96	2 351.25	1 535.99	57.21	NA, NO	255.76	0.49
Per cent change 1990–2015	**–12.8**	**–16.7**	**–16.9**	**6 198 125.3**	**–50.9**	**NA**	**86.7**	**NA**

Note: Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.
[a] CO_2 emissions include indirect CO_2 emissions reported in CRF table 6.

Table 9
Greenhouse gas emissions by sector for Switzerland, 1990–2015
(kt CO_2 eq)

	Energy	*IPPU*	*Agriculture*	*LULUCF*	*Waste*	*Other*
1990	41 889.82	3 950.15	6 780.39	–278.74	1 134.94	13.26
1995	41 905.47	3 166.05	6 488.81	–3 675.71	951.32	13.13
2000	42 188.03	3 306.77	6 108.21	5 017.75	935.94	14.03
2010	43 229.33	4 132.15	6 213.50	–1 253.16	905.08	13.42
2011	39 173.10	4 173.33	6 159.44	–853.56	891.51	14.49
2012	40 562.04	4 174.99	6 126.36	–1 259.72	869.75	15.18
2013	41 500.15	4 202.39	6 059.97	–1 073.38	865.20	15.63
2014	37 474.58	4 246.22	6 150.49	–835.70	856.01	12.48
2015	37 118.21	4 097.55	6 074.42	–893.78	847.64	13.50
Per cent change 1990–2015	**–11.4**	**3.7**	**–10.4**	**220.7**	**–25.3**	**1.9**

Notes: (1) Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions; (2) Totals include indirect CO_2 emissions reported in CRF table 6.

Table 10
Greenhouse gas emissions/removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol by activity, base year[a]–2015, for Switzerland
(kt CO_2 eq)

	Article 3.7 bis as contained in the Doha Amendment[b]	*Article 3.3 of the Kyoto Protocol*		*FM and elected Article 3.4 activities of the Kyoto Protocol*				
	Land-use change	*AR*	*Deforestation*	*FM*	*CM*	*GM*	*RV*	*WDR*
FMRL				220.00				
Technical correction				–1 900.58				
Base year	NA				NA	NA	NA	NA
2013		–17.41	148.07	–2 484.03	NA	NA	NA	NA
2014		–15.31	146.21	–1 077.73	NA	NA	NA	NA
2015		–16.73	150.14	–2 536.44	NA	NA	NA	NA
Per cent change base year–2015					**NA**	**NA**	**NA**	**NA**

Note: Values in this table include emissions on lands subject to natural disturbances, if applicable.

[a] Switzerland has not elected on any activities under Article 3, paragraph 4, of the Kyoto Protocol. For activities under Article 3, paragraph 3, of the Kyoto Protocol, and FM under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] The value reported in this column refers to 1990.

2. Table 11 provides an overview of relevant key data for Switzerland's reporting under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

Table 11
Key relevant data for Switzerland under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

Key parameters	*Values*
Periodicity of accounting	(a) AR: commitment period accounting (b) Deforestation: commitment period accounting (c) FM: commitment period accounting (d) CM: not elected (e) GM: not elected (f) RV: not elected (g) WDR: not elected
Election of activities under Article 3, paragraph 4	None
Election of application of provisions for natural disturbances	Yes, for FM
3.5% of total base-year GHG emissions, excluding LULUCF and including indirect CO_2 emissions	1 879.736 kt CO_2 eq (15 037.884 kt CO_2 eq for the duration of the commitment period)
Cancellation of AAUs, ERUs, CERs and/or issuance of RMUs in the national registry for:	
1. AR in 2015	NA
2. Deforestation in 2015	NA
3. FM in 2015	NA
4. CM in 2015	NA
5. GM in 2015	NA
6. RV in 2015	NA
7. WDR in 2015	NA

Annex II

Information to be included in the compilation and accounting database

Tables 12–14 include the information to be included in the compilation and accounting database for Switzerland. Data shown are from the original annual submission of the Party, including the latest revised estimates submitted, adjustments (if applicable) as well as the final data to be included in the compilation and accounting database.

Table 12
Information to be included in the compilation and accounting database for 2015, including on the commitment period reserve, for Switzerland
(t CO_2 eq)

	Original submission	*Revised estimates*	*Adjustment*	*Final*
CPR	325 591 674	325 591 672		325 591 672
Annex A emissions for 2015				
CO_2[a]	38 852 168			38 852 168
CH_4	5 084 962			5 084 962
N_2O	2 351 246			2 351 246
HFCs	1 535 994			1 535 994
PFCs	57 207			57 207
Unspecified mix of HFCs and PFCs	NA			NA
SF_6	255 757			255 757
NF_3	487			487
Total Annex A sources	**48 137 822**			**48 137 822**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2015				
3.3 AR	–16 725			–16 725
3.3 Deforestation	150 140			150 140
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2015				
3.4 FM	–2 536 439			–2 536 439

[a] CO_2 emissions include indirect CO_2 emissions reported in CRF table 6.

Table 13
Information to be included in the compilation and accounting database for 2014 for Switzerland
(t CO_2 eq)

	Original submission	*Revised estimates*	*Adjustment*	*Final*
Annex A emissions for 2014				
CO_2[a]	39 377 245			39 377 245
CH_4	5 120 239			5 120 239
N_2O	2 399 636			2 399 636
HFCs	1 526 904			1 526 904
PFCs	44 031			44 031
Unspecified mix of HFCs and PFCs	NA			NA
SF_6	258 842			258 842
NF_3	404			404
Total Annex A sources	**48 727 301**			**48 727 301**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2014				
3.3 AR	–15 307			–15 307
3.3 Deforestation	146 207			146 207
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2014				
3.4 FM	–1 077 731			–1 077 731

[a] CO_2 emissions include indirect CO_2 emissions reported in CRF table 6.

Table 14
Information to be included in the compilation and accounting database for 2013 for Switzerland
(t CO_2 eq)

	Original submission	*Revised estimates*	*Adjustment*	*Final*
Annex A emissions for 2013				
CO_2[a]	43 307 537			43 307 537
CH_4	5 117 816			5 117 816
N_2O	2 384 049			2 384 049
HFCs	1 513 821			1 513 821
PFCs	51 930			51 930
Unspecified mix of HFCs and PFCs	NA			NA
SF_6	252 457			252 457
NF_3	95			95
Total Annex A sources	**52 627 706**			**52 627 706**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2013				
3.3 AR	–17 409			–17 409
3.3 Deforestation	148 067			148 067
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2013				
3.4 FM	–2 484 025			–2 484 025

[a] CO_2 emissions include indirect CO_2 emissions reported in CRF table 6.

Annex III

Additional information to support findings in table 2

Missing categories that may affect completeness

The categories for which methods are included in the 2006 IPCC Guidelines that were reported as "NE" or for which the ERT otherwise determined that there may be an issue with the completeness of reporting in the Party's inventory are the following:

(a) CO_2, CH_4 and N_2O emissions from venting and flaring – natural gas (see ID# E.12 in table 3).

Annex IV

Documents and information used during the review

A. Reference documents

Reports of the Intergovernmental Panel on Climate Change

IPCC. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories.* S Eggleston, L Buendia, K Miwa, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at http://www.ipcc-nggip.iges.or.jp/public/2006gl.

IPCC. 2014. *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*. Available at http://www.ipcc-nggip.iges.or.jp/public/kpsg.

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Annual review reports

Reports on the individual review of the 2014, 2015 and 2016 annual submissions of Switzerland contained in documents FCCC/ARR/2014/CHE, FCCC/ARR/2015/CHE and FCCC/ARR/2016/CHE, respectively.

Other

Aggregate information on greenhouse gas emissions by sources and removals by sinks for Parties included in Annex I to the Convention. Note by the secretariat. Available at http://unfccc.int/resource/webdocs/agi/2017.pdf.

Annual status report for Switzerland for 2017. Available at http://unfccc.int/resource/docs/2017/asr/che.pdf.

EEA. 2013. *EMEP/EEA air pollution emission inventory guidebook 2013*. Available at www.eea.europa.eu/publications/emep-eea-guidebook-2013.

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FOEN. 2017. *Switzerland's informative inventory report 2017 (IIR), submission under the UNECE Convention on Long-range Transboundary Air Pollution, submission of March 2017 to the United Nations ECE Secretariat.* Bern, Switzerland: Federal Office for the Environment. Available at https://www.bafu.admin.ch/dam/bafu/de/dokumente/luft/fachinfo-daten/switzerland_s_informativeinventoryreport2016iir.pdf.

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Michael Bock (Swiss Federal Department of the Environment), including additional material on the methodology and assumptions used.

EMPA (2013). "Schlussbericht:N_2O und CH_4 Emissionen aus KVAs", Duebendorf, 2013.

Cement Sustainable Initiative (CSI) 2011: CO_2 and Energy Accounting and Reporting Standard for the Cement Industry – – The Cement CO_2 and Energy Protocol. Available at: http://www.cement-CO_2-protocol.org/en/Content/Resources/Downloads/WBCSD_CO_2_Protocol_En.pdf.

Flisch, R., Sinaj, S., Charles, R., Richner, W. 2009: Grundlagen für die Düngung im Acker- und Futterbau 2009 (Principles of Fertilisation in Arable and Forage Crop Production).

Forschungsanstalt Agroscope Changins-Wädenswil ACW und Agroscope Reckenholz-Tänikon ART, Agrarforschung 16 (2). http://www.agrarforschungschweiz.ch/archiv_11de.php?jahr=2009&band=16&heft=02.

Kaufmann, E. 2001: Estimation of Standing Timber, Growth and Cut. In: Brassel, P.; Lischke, H. (eds). Swiss National Forest Inventory: Methods and Models of the Second Assessment. Birmensdorf, Swiss Federal Research Institute WSL. 162–196. http://www.lfi.ch/publikationen/publ/LFI2_Methoden.pdf.

Thürig, E., Rösler, E., Didion, M. 2017: NFI4 2011–2015: Calculation of emission factors for living biomass in Swiss forests for the Swiss GHGI 2017. Internal documentation of data delivery and more recent data. Report commissioned by the Swiss Federal Office for the Environment, Bern. http://www.climatereporting.ch.