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Report on the technical review of the seventh national communication of Switzerland

Parties included in Annex I to the Convention were requested by decision 9/CP.16 to submit their seventh national communication to the secretariat by 1 January 2018. According to decision 15/CMP.1, Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol are required to include in their national communications supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. This report presents the results of the technical review of the seventh national communication and relevant supplementary information under the Kyoto Protocol of Switzerland, conducted by an expert review team in accordance with the “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” and the “Guidelines for review under Article 8 of the Kyoto Protocol”.

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Abbreviations and acronyms

BR	biennial report
CATCOS	Capacity Building and Twinning for Climate Observing Systems
CH ₄	methane
CHF	Swiss francs
CO ₂	carbon dioxide
CO ₂ eq	carbon dioxide equivalent
CTF	common tabular format
EPFL	Swiss Federal Institute of Technology of Lausanne
ERT	expert review team
EU	European Union
EU ETS	European Union Emissions Trading System
F-gas	fluorinated gas
GCOS	Global Climate Observing System
GDP	gross domestic product
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
IE	included elsewhere
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
NA	not applicable
NC	national communication
NE	not estimated
NF ₃	nitrogen trifluoride
NMVOG	non-methane volatile organic compound
NO	not occurring
non-Annex I Party	Party not included in Annex I to the Convention
N ₂ O	nitrous oxide
PaMs	policies and measures
PFC	perfluorocarbon
QELRC	quantified emission limitation or reduction commitment
reporting guidelines for supplementary information	“Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol, Part II: Reporting of supplementary information under Article 7, paragraph 2”
SF ₆	sulfur hexafluoride
UNFCCC reporting guidelines on NCs	“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications”
WAM	‘with additional measures’
WEM	‘with measures’
WOM	‘without measures’

I. Introduction and summary

A. Introduction

1. This is a report on the in-country technical review of the NC7 of Switzerland. The review was coordinated by the secretariat in accordance with the “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”, particularly “Part V: UNFCCC guidelines for the technical review of national communications from Parties included in Annex I to the Convention” (annex to decision 13/CP.20), and the “Guidelines for review under Article 8 of the Kyoto Protocol” (annex to decision 22/CMP.1 and annex I to decision 4/CMP.11).¹

2. In accordance with the same decisions, a draft version of this report was transmitted to the Government of Switzerland, which provided comments that were considered and incorporated, as appropriate, with revisions into this final version of the report.

3. The review was conducted from 18 to 23 March 2019 in Bern by the following team of nominated experts from the UNFCCC roster of experts: Mr. Eric De Brabanter (Luxembourg), Mr. Kamal Djemouai (Algeria), Ms. Yu’e Li (China), Mr. Mark Molnar (Hungary), Mr. Glen Whitehead (Australia) and Ms. Sumaya Ahmed Zakieldean (Sudan). Mr. Djemouai and Mr. Molnar were the lead reviewers. The review was coordinated by Ms. Kyoko Miwa (UNFCCC secretariat).

B. Summary

4. The ERT conducted a technical review of the information reported in the NC7 of Switzerland in accordance with the UNFCCC reporting guidelines on NCs (decision 4/CP.5) and the reporting guidelines for supplementary information, in particular the supplementary information required under Article 7, paragraph 2, and on the minimization of adverse impacts under Article 3, paragraph 14, of the Kyoto Protocol (annex to decision 15/CMP.1 and annex III to decision 3/CMP.11).

1. Timeliness

5. The NC7 was submitted on 19 December 2017, before the deadline of 1 January 2018 mandated by decision 9/CP.16. An amendment to the NC7 and the BR3 was submitted on 3 April 2019.

2. Completeness, transparency of reporting and adherence to the reporting guidelines

6. Issues and gaps identified by the ERT related to the reported information are presented in table 1. The information reported by Switzerland in its NC7, including the supplementary information under the Kyoto Protocol, completely adheres to the UNFCCC reporting guidelines on NCs.

¹ At the time of the publication of this report, the Party had submitted its instrument of acceptance 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.

Table 1
Assessment of completeness and transparency of mandatory information reported by Switzerland in its seventh national communication, including supplementary information under the Kyoto Protocol

<i>Section of NC</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of recommendations</i>	<i>Supplementary information under the Kyoto Protocol</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of recommendations</i>
Executive summary	Complete	Transparent		National system	Complete	Transparent	
National circumstances	Complete	Transparent		National registry	Complete	Transparent	
GHG inventory	Complete	Transparent		Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Complete	Transparent	
PaMs	Complete	Transparent		PaMs in accordance with Article 2	Complete	Transparent	
Projections and the total effect of PaMs	Complete	Transparent		Domestic and regional programmes and/or arrangements and procedures	Complete	Transparent	
Vulnerability assessment, climate change impacts and adaptation measures	Complete	Transparent		Information under Article 10 ^a	Complete	Transparent	
Financial resources and transfer of technology	Complete	Transparent		Financial resources	Complete	Transparent	
Research and systematic observation	Complete	Transparent		Minimization of adverse impacts in accordance with Article 3, paragraph 14	Complete	Transparent	
Education, training and public awareness	Complete	Transparent					

Note: The assessment of completeness and transparency by the ERT in this table is based only on the “shall” reporting requirements.

^a The assessment refers to information provided by the Party on the provisions contained in Article 4, paragraphs 3, 5 and 7, of the Convention reported under Article 10 of the Kyoto Protocol, which is relevant to Parties included in Annex II to the Convention only. Assessment of the information provided by the Party on the other provisions of Article 10 of the Kyoto Protocol is provided under the relevant substantive headings under the Convention, for example research and systematic observation.

3. Summary of reviewed supplementary information under the Kyoto Protocol

7. The supplementary information under Article 7, paragraph 2, of the Kyoto Protocol is incorporated in different sections of the NC7, and the supplementary information under Article 7, paragraph 1, of the Kyoto Protocol is reported in the national inventory report of the 2017 annual submission. Table 2 provides references to where the information is reported. The technical assessment of the information reported under Article 7, paragraphs 1 and 2, of the Kyoto Protocol is contained in the relevant sections of this report.

Table 2

Overview of supplementary information under the Kyoto Protocol reported by Switzerland

<i>Supplementary information</i>	<i>Reference to section of NC7</i>
National registry	3.4
National system	3.3
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	B3.6 in annex B
PaMs in accordance with Article 2	4
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	4.1.1 and 4.7.1
Information under Article 10	3.3, 4, 6.4–6.6, 7.2, 8 and 9
Financial resources	7
Minimization of adverse impacts in accordance with Article 3, paragraph 14	4.13

II. Technical review of the information reported in the seventh national communication, including the supplementary information under the Kyoto Protocol

A. Information on national circumstances and greenhouse gas emissions and removals

1. National circumstances relevant to greenhouse gas emissions and removals

(a) Technical assessment of the reported information

8. The national circumstances of Switzerland explain the relationship between its historical and future emission trends and the climate change policy agenda. The changing nature of those circumstances defines the factors that affect the climate policy development and implementation of the Convention. The NC7 contains key data on legislation, population trends, geography and land use, climate and climate change, economic developments, energy, transport, the buildings sector, industry, trade, the services sector, agriculture, forestry, resource efficiency and wastewater.

9. Switzerland has experienced steady population and economic growth since 1990. The population increased by 23 per cent over the period 1990–2015 and has been increasing at the rate of more than 1 per cent/year in recent years. The nominal GDP per capita increased by 46.6 per cent during the period 1990–2008 and has remained stable since. Annual variations in emissions are strongly influenced by weather conditions, in particular the demand for heating during winter.

10. The ERT noted that Switzerland's GDP per capita grew to 2008 and was relatively stable between 2008 and 2017. During the period 1990–2016, GDP per capita increased by 19.2 per cent, while GHG emissions per GDP unit and GHG emissions per capita decreased by 39.0 and 27.3 per cent, respectively. The decreases can be primarily attributed to the reductions in emissions from fuel combustion in the residential and commercial sector after 2005 despite increases in population and economic activity. Table 3 illustrates the national circumstances of Switzerland by providing some indicators relevant to emissions and removals.

Table 3

Indicators relevant to greenhouse gas emissions and removals for Switzerland for the period 1990–2016

Indicator	Change (%)						
	1990	2000	2010	2015	2016	1990–2016	2015–2016
GDP per capita (thousands 2011 USD using purchasing power parity)	48.18	50.78	55.87	57.26	57.42	19.2	0.3
GHG emissions without LULUCF per capita (t CO ₂ eq)	7.92	7.27	6.92	5.77	5.76	–27.3	–0.3
GHG emissions without LULUCF per GDP unit (kg CO ₂ eq per 2011 USD using purchasing power parity)	0.16	0.14	0.12	0.10	0.10	–39.0	–0.6

Sources: (1) GHG emission data: Switzerland's 2018 GHG inventory submission, version 2; (2) population and GDP: World Bank.

Note: The ratios per capita and per GDP unit are calculated relative to GHG emissions without LULUCF; the ratios are calculated using the exact (not rounded) values and may therefore differ from a ratio calculated with the rounded numbers provided in the table.

(b) Assessment of adherence to the reporting guidelines

11. The ERT assessed the information reported in the NC7 of Switzerland and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. There were no issues raised during the review relating to the topics discussed in this chapter of the review report.

2. Information on greenhouse gas inventory arrangements, emissions, removals and trends

(a) Technical assessment of the reported information

12. Total GHG emissions² excluding emissions and removals from LULUCF decreased by 9.4 per cent between 1990 and 2016, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 11.7 per cent over the same period. Table 4 illustrates the emission trends by sector and by gas for Switzerland.

² In this report, the term “total GHG emissions” refers to the aggregated national GHG emissions expressed in terms of CO₂ eq excluding LULUCF, unless otherwise specified. Values in this paragraph are calculated on the basis of the 2018 annual submission, version 2.

Table 4
Greenhouse gas emissions by sector and by gas for Switzerland for the period 1990–2016

Sector	GHG emissions (kt CO ₂ eq)					Change (%)		Share (%)	
	1990	2000	2010	2015	2016	1990–2016	2015–2016	1990	2016
	1. Energy	41 826.39	42 182.82	43 211.86	37 087.30	37 484.48	-10.4	1.1	78.6
A1. Energy industries	2 519.47	3 171.90	3 846.52	3 292.58	3 380.40	34.2	2.7	4.7	7.0
A2. Manufacturing industries and construction	6 443.43	5 924.59	5 816.59	4 972.87	4 981.93	-22.7	0.2	12.1	10.3
A3. Transport	14 639.33	15 927.23	16 328.93	15 324.38	15 154.73	3.5	-1.1	27.5	31.4
A4. and A5. Other	17 861.10	16 799.15	16 937.38	13 277.93	13 745.72	-23.0	3.5	33.6	28.5
B. Fugitive emissions from fuels	363.06	359.96	282.44	219.55	221.69	-38.9	1.0	0.7	0.5
C. CO ₂ transport and storage	NO	NO	NO	NO	NO	NA	NA	NA	NA
2. IPPU	3 575.62	3 141.29	4 005.54	3 963.94	3 990.78	11.6	0.7	6.7	8.3
3. Agriculture	6 672.32	5 988.80	6 089.13	5 991.78	5 963.11	-10.6	-0.5	12.5	12.4
4. LULUCF	-730.19	4 758.90	-1 545.71	-1 407.15	-1 870.40	156.2	32.9	NA	NA
5. Waste	1 109.44	869.16	818.33	757.81	748.30	-32.6	-1.3	2.1	1.6
6. Other	12.22	12.99	12.40	12.46	12.20	-0.2	-2.1	0.0	0.0
Indirect CO ₂ emissions from energy, IPPU, waste and other	402.71	179.65	116.60	109.11	107.77	-73.2	-1.2	NA	NA
<i>Gas^a</i>									
CO ₂	44 161.94	43 611.92	45 045.10	38 738.55	39 204.91	-11.2	1.2	83.0	81.3
CH ₄	6 005.43	5 286.95	5 129.16	4 955.65	4 907.43	-18.3	-1.0	11.3	10.2
N ₂ O	2 775.07	2 468.58	2 426.04	2 285.16	2 300.54	-17.1	0.7	5.2	4.8
HFCs	0.02	633.91	1 316.04	1 522.97	1 523.33	6 147 036.2	0.0	0.0	3.2
PFCs	116.52	49.90	64.49	54.72	55.02	-52.8	0.5	0.2	0.1
SF ₆	137.01	143.79	147.98	255.76	207.11	51.2	-19.0	0.3	0.4
NF ₃	NA, NO	NA, NO	8.45	0.49	0.51	NA	5.1	NA	0.0
Total GHG emissions without LULUCF	53 195.99	52 195.05	54 137.27	47 813.30	48 198.86	-9.4	0.8	100.0	100.0
Total GHG emissions with LULUCF	52 465.80	56 953.95	52 591.55	46 406.15	46 328.46	-11.7	-0.2	NA	NA
Total GHG emissions without LULUCF, including indirect CO₂	53 598.69	52 374.70	54 253.86	47 922.41	48 306.63	-9.9	0.8	NA	NA
Total GHG emissions with LULUCF, including indirect CO₂	52 868.51	57 133.60	52 708.15	46 515.26	46 436.23	-12.2	-0.2	NA	NA

Source: GHG emission data: Switzerland's 2018 annual submission, version 2.

^a Emissions by gas without LULUCF and without indirect CO₂.

13. The decrease in total emissions was driven mainly by factors such as the measures to reduce fuel use, changes in the fuel mix from coal to biomass and lower-emitting fuels, and a reduction in the cattle population.

14. Between 1990 and 2016, GHG emissions from the energy sector decreased by 10.4 per cent (4,341.91 kt CO₂ eq) owing mainly to reduced emissions from fuel combustion, which showed notable decreases in the category other sectors (23.0 per cent or 4,115.38 kt CO₂ eq), and energy use in manufacturing industries and construction (22.7 per cent or 1,461.50 kt CO₂ eq). The decline in emissions from other sectors is due to improved insulation in buildings and improved combustion equipment efficiency, which have more than offset the increase in floor space to be heated. Emissions from non-metallic minerals have reduced by 1,016.58 kt CO₂ eq or 47.5 per cent following a decline in energy consumption due to fuel switching from coal and fuel oil to other fossil fuels and biomass. Emissions from transport have increased by 515.39 kt CO₂ eq or 3.5 per cent; increased activity due to population and economic growth has been largely offset by improved efficiency and mode of transport. Energy industries are a relatively small source of emissions in Switzerland as most electricity is generated from hydro, nuclear and waste incineration power plants.

15. Between 1990 and 2016, GHG emissions from IPPU increased by 11.6 per cent (415.16 kt CO₂ eq), owing mainly to the increased use of synthetic GHGs as a replacement for ozone-depleting substances. Between 1990 and 2016, GHG emissions from the agriculture sector decreased by 10.6 per cent (709.21 kt CO₂ eq), owing mainly to a reduction in the cattle population and the decreased use of mineral fertilizers. The LULUCF sector was a net sink of 1,870.40 kt CO₂ eq in 2016; net GHG removals have increased by 1,140.21 kt CO₂ eq since 1990. The trend was mainly driven by reduced harvesting rates of forests since 2008. Between 1990 and 2016, GHG emissions from the waste sector decreased by 32.6 per cent (361.14 kt CO₂ eq), owing mainly to the banning of the landfilling of combustible waste.

16. CO₂ emissions accounted for 83.1 per cent of the national total excluding indirect CO₂ and excluding LULUCF emissions and removals in 1990 and 81.4 per cent in 2016. Over the period 1990–2016, CO₂ emissions decreased by 11.2 per cent (4,957.03 kt CO₂ eq), largely owing to a reduction in emissions from fuel combusted in the residential and commercial sector and the non-metallic minerals manufacturing industry.

17. CH₄ emissions accounted for 10.2 per cent of the national total excluding indirect CO₂ and excluding LULUCF emissions and removals in 2016. Emissions decreased by 18.3 per cent (1,098.00 kt CO₂ eq) between 1990 and 2016 owing to a reduction in the cattle population, which has reduced emissions in the agriculture sector, and the banning of the landfilling of municipal solid waste, which has reduced emissions from solid waste disposal in the waste sector.

18. N₂O emissions accounted for 4.8 per cent of the national total excluding indirect CO₂ and excluding LULUCF in 2016, and they have decreased by 17.1 per cent (474.53 kt CO₂ eq) since 1990 because of a reduction in emissions from agriculture. Emissions of other gases (HFCs, PFCs, SF₆ and NF₃) increased from 0.5 per cent of the national total including indirect CO₂ and excluding LULUCF in 1990 to 3.7 per cent in 2016, with the major increase being in HFCs, which have replaced ozone-depleting substances.

19. The summary information provided on GHG emissions was consistent with the information reported in the 2017 annual submission. The information on historical emissions included in this report is taken from the latest available national GHG inventory report, the 2018 annual submission.

20. The NC7 of Switzerland stated that the GHG inventory information was calculated using GWP values according to the Second Assessment Report of the IPCC based on the effect of GHGs over a 100-year time horizon. In response to a question from the ERT Switzerland confirmed that this was a typographical error and that emissions are calculated based on the GWP from the Fourth Assessment Report of the IPCC. The ERT noted that the

amendment to the NC7, submitted during the review, indicates that the GWP from the IPCC Fourth Assessment Report were used to calculate the emissions.

(b) Assessment of adherence to the reporting guidelines

21. The ERT assessed the information reported in the NC7 of Switzerland and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

3. National system for the estimation of anthropogenic emissions by sources and removals by sinks

(a) Technical assessment of the reported information

22. Switzerland provided in the NC7 a description of how its national system for the estimation of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol is performing the general and specific functions defined in the annex to decision 19/CMP.1. The description includes all the elements mandated by paragraph 30 of the annex to decision 15/CMP.1. The NC7 also contains a reference to the description of the national system provided in the national inventory report of the 2017 annual submission. The ERT took note of the review of the changes to the national system reflected in the report on the individual review of the 2017 annual submission of Switzerland.

(b) Assessment of adherence to the reporting guidelines

23. The ERT assessed the information reported in the NC7 of Switzerland and recognized that the reporting is complete and transparent. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

4. National registry

(a) Technical assessment of the reported information

24. In the NC7 Switzerland provided information on how its national registry performs the functions in accordance with the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1 and complies with the requirements of the technical standards for data exchange between registry systems. The ERT took note of the review of the changes to the national registry reflected in the report on the individual review of the 2017 annual submission of Switzerland.

25. Information on Switzerland's national registry, namely the database structure and capacity, security measures and measures for safeguarding, maintaining and recovering data in the event of a disaster, is reported as confidential in Switzerland's NC7. In response to a question from the ERT, Switzerland provided the confidential information addressing the reporting requirements. The ERT considers that, in order to enhance the reporting, summary information that is not confidential, for example whether Switzerland maintains a disaster recovery plan for the national registry, could be included in Switzerland's next NC.

(b) Assessment of adherence to the reporting guidelines

26. The ERT assessed the information reported in the NC7 of Switzerland and recognized that the reporting is complete and transparent. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

B. Information on policies and measures and institutional arrangements

1. Domestic and regional programmes and/or legislative arrangements and procedures related to the Kyoto Protocol

(a) Technical assessment of the reported information

27. For the second commitment period of the Kyoto Protocol, from 2013 to 2020, Switzerland committed to reducing its GHG emissions by 15.8 per cent below the base-year level. Switzerland has domestic policies in place and will also use international carbon credits generated from the flexible mechanisms under the Kyoto Protocol. Switzerland may also use units carried over from the first commitment period.

28. Implementation of the Kyoto Protocol by Switzerland is underpinned by the 2013 second CO₂ Act, which defines objectives and forms the foundation for some PaMs to meet the emission reduction target. In addition, the Act sets incentives for increasing the uptake of renewable energy sources, making improvements in energy efficiency and developing low-emission technologies. The Act gives the national government the responsibility of coordinating adaptation measures at the national level. The overall responsibility for climate change policymaking lies with the Interdepartmental Sustainable Development Committee, which defines the priorities for action and oversees the implementation and monitoring of progress. In addition, the Interdepartmental Committee on Climate of the federal authorities is responsible for the coordination of climate policy. The committee is led by the Federal Office for the Environment.

29. Switzerland has legislative arrangements and administrative procedures in place to make information publicly accessible, such as the Federal Office for the Environment website, which includes a list of relevant legislation and of enforcement and administrative procedures.

30. Switzerland has national legislative arrangements and administrative procedures in place that seek to ensure that the implementation of activities under Article 3, paragraph 3, forest management under Article 3, paragraph 4, and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol also contributes to the conservation of biodiversity and the sustainable use of natural resources. Legislation and administrative procedures set out in the Forest Act, which was first implemented in 1876 and had major revisions and extensions in 1902 and 1993, and Forest Policy 2020 support sustainable forest management in Switzerland with a view to conserving biodiversity and mitigating climate change.

(b) Assessment of adherence to the reporting guidelines

31. The ERT assessed the information reported in the NC7 of Switzerland and recognized that the reporting is complete, transparent and adhering to the reporting guidelines for supplementary information. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

2. Policies and measures, including those in accordance with Article 2 of the Kyoto Protocol

(a) Technical assessment of the reported information

32. Switzerland provided information on its package of PaMs implemented, adopted and planned, by sector and by gas, in order to fulfil its commitments under the Convention and its Kyoto Protocol. Switzerland reported on its policy context and legal and institutional arrangements put in place to implement its commitments and monitor and evaluate the effectiveness of its PaMs.

33. Switzerland provided information on a set of PaMs similar to those previously reported, with a few exceptions. Switzerland reported no fundamental changes since the previous submission to its institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of the progress made towards its target.

34. Switzerland provided information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals in accordance with the objective of the Convention. Switzerland reported on how it periodically updates its PaMs to reduce greater levels of emissions and on the PaMs that have been discontinued since the previous submission. Related information is presented in paragraphs 37–39 below.

35. Some PaMs are implemented jointly with the administrations at the regional (cantonal) level. For example, the national buildings refurbishment programme was jointly developed by the cantons and the federal administration. The cantons are responsible for its implementation. Under the cantonal building codes, the cantons are responsible for decreeing any regulations in the building sector.

36. Switzerland has improved the completeness of its reporting since the NC6 by including some information on quantified non-GHG benefits and ‘whole of economy’ costs of PaMs. The ERT noted, however, that the NC7 did not include descriptive information on the non-GHG benefits that were discussed during the review, such as energy security benefits from energy efficiency PaMs. The ERT also noted that the NC7 did not include information on other types of costs, for example the administrative cost of implementing the PaMs that were discussed during the review week. During the review, the Party provided an amendment to the NC7, which provided more information on the costs and non-GHG benefits of some PaMs.

37. The key overarching cross-sectoral policy reported by Switzerland is the CO₂ Act (more formally the Federal Act on the Reduction of CO₂ Emissions), which provides the framework for climate policies. The first CO₂ Act entered into force in 2000 in the light of the requirement for Switzerland to meet the target of the first commitment period of the Kyoto Protocol; it was replaced by the second CO₂ Act, which entered into force in 2013 to enable Switzerland to meet its emission reduction target for 2020 and the second commitment period. The mitigation effect of the cantonal building codes is projected to be 1,760 kt CO₂ eq in 2020, which is the most significant of the measures taken. Other policies that will deliver significant emission reductions are the CO₂ emission regulations for newly registered vehicles and a CO₂ levy on heating and process fuels, which are expected to reduce emissions in 2020 by 1,700 and 1,600 kt CO₂ eq, respectively.

38. The most significant cross-cutting policy is the CO₂ levy on heating and process fuels, which increases the cost of fossil heating and process fuels and provides an incentive for energy efficiency and for switching to less emission-intensive fuels. The levy is currently CHF 96/t CO₂. Revenue from the levy is refunded to households and businesses and funds the national buildings refurbishment programme. Certain companies can apply for exemption from the CO₂ levy on heating and process fuels and instead reduce their emissions through negotiated reduction commitments that take account of the technological and economic viability of abatement measures. The estimated mitigation impact in 2020 of the CO₂ levy and negotiated reduction commitments is 1,600 and 400 kt CO₂ eq, respectively.

39. Switzerland has an emissions trading scheme based on the cap-and-trade system covering industries with substantial CO₂ emissions resulting from the use of heating and process fuels and from cement production. The scheme is designed to give participating industries the flexibility of reducing emissions under the same framework as the EU ETS while being exempt from the CO₂ levy on heating and process fuels. The two schemes are intended to be linked from January 2020. The estimated mitigation impact in 2020 is 800 kt CO₂ eq.

40. Switzerland highlighted the mitigation actions that are under development, such as the third CO₂ Act, which is to come into force in 2021. In the NC7 Switzerland also outlined the planned strengthening of a number of existing PaMs. Table 5 provides a summary of the reported information on the PaMs of Switzerland.

Table 5
Summary of information on policies and measures reported by Switzerland

<i>Sector</i>	<i>Key PaMs</i>	<i>Estimate of mitigation impact by 2020 (kt CO₂ eq)</i>
Policy framework and cross-sectoral measures	Second CO ₂ Act	1E ^a
	Emissions trading scheme	800
	CO ₂ levy on heating and process fuels	1 600
	Negotiated reduction commitments	400
Energy		
Transport	CO ₂ emission regulations for newly registered vehicles	1 700
	Partial compensation of CO ₂ emissions from motor fuel use	1 500
	Heavy vehicle charge	140
	Mineral oil tax reduction on biofuels and natural gas	220
Renewable energy	Obligation to offset emissions from gas-fired combined-cycle power plants	NA
Energy efficiency	National buildings refurbishment programme	1 120
	Cantonal building codes	1 760
IPPU	Provisions relating to substances stable in the atmosphere (HFCs, PFCs, SF ₆ , NF ₃)	895
	International exhaust gas regulations (NMVOCs)	200
	NMVOC incentive fee	380
Agriculture	Proof of ecological performance to receive direct payments	700
	Further development of the direct payments system (orientation towards targets)	200
LULUCF	Measures within Forest Policy 2020	1 200
Waste	Ban on the landfilling of combustible waste	177
	Ordinance on the Avoidance and Management of Waste	28

Note: The estimates of mitigation impact are estimates of emissions of CO₂ or CO₂ eq avoided in a given year as a result of the implementation of mitigation actions.

^a Mitigation impacts of the second CO₂ Act are accounted for under PaMs that are part of this Act.

(b) Policies and measures in the energy sector

41. Switzerland is equipped at the federal level with various legal instruments for environmental goals that also support mitigation actions across sectors: the Energy Act (1998), the Forest Act (1991), the Spatial Planning Act (1979), the Agriculture Act (1998), the Road Traffic Act (1958), the Heavy Vehicle Charge Act (1997), the Mineral Oil Tax Act (1996) and the Ordinance on the Avoidance and Management of Waste (2015). Specific

PaMs to address GHG emission reductions from relevant sectors have been evolving to address the goals of these Acts.

42. The Energy Strategy 2050, which was developed and adopted in 2017 by public vote, facilitates the gradual phasing out of nuclear energy and the successive reorganization of the Swiss energy system by 2050. The Strategy sets a number of priority areas to assure future energy supply, including the reduction of energy consumption, broadening of electricity supply, expansion and restructuring of the electricity transmission grid and energy storage, and strengthening of energy research, and sets out the financial measures for the implementation of actions. As a part of the Energy Strategy 2050, the first set of measures legislated as the new Energy Act took effect on 1 January 2018. The Act emphasizes increase of energy efficiency, expansion of hydropower and implementation of new sources of renewable energy, and it defines the guidelines for promoting measures for those areas, as detailed in paragraphs 43–46 below.

43. **Energy supply.** Switzerland reported that the total primary energy supply was 1,087,820 TJ in 2016. On the basis of the energy flow diagram provided in the NC7, the ERT calculated that the energy supply from oil and oil products accounted for 42.1 per cent, followed by nuclear fuel and hydropower (33.6 per cent), natural gas (11.5 per cent), wood, coal and waste (9.8 per cent) and other renewable energy sources (2.9 per cent). The ERT noted that electricity production, which accounts for 24.8 per cent of the total final energy consumption in Switzerland, was mostly generated by renewable energy sources. According to the energy statistics published in 2018, the share of fossil fuels in energy production in Switzerland is very low (1.9 per cent of total production or 1,183 GWh); in 2016, 61.9 per cent of electricity was produced from hydropower, 34.7 per cent from nuclear fuel and 3.4 per cent from other renewable resources. The supply scheme for renewable energy sources provides a market premium of 0.2 centimes/kWh for existing large hydropower plants, on top of the new surcharge of 2.3 centimes/kWh. This scheme promotes renewable energy sources, energy efficiency and the renaturation of rivers.

44. **Renewable energy sources.** The Energy Strategy 2050 sets guidelines for promoting renewable energy sources and hydropower. The target for domestic production of renewable energy excluding hydropower is an increase to 4,400 GWh and 11,400 GWh in 2020 and 2035, respectively. The target for hydropower generation is an increase to 37,400 GWh in 2035. During the review week, Switzerland provided information on various financial incentives for renewable energy producers, which include feed-in remuneration; market premium for existing large-scale hydropower plants; supporting investments in new large-scale hydropower plants, geothermal exploration, small-scale hydropower and biomass; and one-time remuneration for photovoltaic systems. The promotion of renewable energy sources is financed by an electricity network surcharge, which increased from 1.5 to 2.3 centimes/kWh in January 2018. A portion of the network surcharge will be also used to refund energy-intensive companies provided that they, inter alia, comply with the commitment to enhancing energy efficiency under a target agreement with the Swiss Government.

45. **Energy efficiency.** The buildings refurbishment programme started in 2010 and is organized by both the federal Government and the cantons. The programme supports investments in building insulation, renewable heat supply and building systems. Funding is provided by income from the CO₂ levy on heating and process fuels (at the federal level) and by the cantons. The programme has subsidized projects totalling over CHF 1.3 billion from 2010 to 2016, and its mitigation impact was 21.5 Mt CO₂ eq over the supported projects' lifetime (IEA, 2018). The programme consists of two parts: building envelope and switch to renewable energy heating systems. The target was to save 1.5–2.2 Mt CO₂ building sector emissions annually from 2010 to 2020. An evaluation of the first five years of the programme (2010–2014) showed estimated mitigation impacts of 0.6 Mt CO₂ savings annually by 2014. The first part of the programme was more successful than the second, which produced only half of its expected annual reductions. The evaluation concluded that the mix of Swiss CO₂ policies and changes in the market have created sufficient momentum for investment. Consequently, the buildings refurbishment programme could be phased out after 2025. The evaluation also proposed ways of modifying the programme to increase its efficiency and

impact. These were reflected in the partial revision of the CO₂ Act in 2016 (in force since 2018) as part of the Energy Strategy 2050.

46. The new Energy Act sets guidelines for improving energy efficiency, such as the target to reduce average per capita energy consumption by 16 per cent by 2020. In the Energy Strategy 2050, it is indicated that in 2017 the per capita energy consumption of the Party was 90.7 GJ (0.025 GWh), 15.7 per cent lower than in 2000. The Act sets the target to further reduce consumption by 43 per cent by 2035 compared with the 2000 level. The Act also aims for a reduction in electricity consumption per person by 3 per cent by 2020 and by 13 per cent by 2035 compared with the 2000 level. The PaMs to increase energy efficiency include the national buildings refurbishment programme and the cantonal building codes in the residential and commercial sectors, CO₂ emission regulations for newly registered vehicles in the transport sector and negotiated commitments on energy efficiency in the industrial sector. During the review week, Switzerland provided more information on the progress of energy efficiency improvements.

47. **Residential and commercial sectors.** The CO₂ levy on heating and process fuels has been playing an important role in the implementation of the national buildings refurbishment programme. Up to a third (or a maximum of CHF 450 million as at 2018) of the revenue from the CO₂ levy on heating and process fuels has been earmarked to finance the programme. The Swiss Federal Council proposes that this allocation of earmarked funds be extended to 2025. The mitigation impact is projected to be 1.12 Mt CO₂ eq in 2020. The cantonal building codes provided a set of common energy and insulation standards (model ordinances) aiming at reducing energy consumption in the buildings. Cantons are responsible for integrating the model ordinances into cantonal legislation that sets out minimum requirements, such as the requirement for new buildings to autonomously cover their own heat demand and produce a reasonable share of their electricity demand, the prohibition on the use of electricity for heating and warm water production, the refurbishment of existing buildings, and the switch to and increasing promotion of renewable energy sources. The estimated mitigation impact of the building codes is 1.76 Mt CO₂ eq in 2020.

48. **Transport sector.** The Swiss Parliament amended the CO₂ Act in 2011 (the second CO₂ Act) to include CO₂ emission targets for newly registered vehicles. In the first phase, during 2012–2015, a fleet average of 130 g CO₂/km was set. As a part of the first set of measures in the Energy Strategy 2050, these targets were enhanced to 95 g CO₂/km for new passenger cars and 147 g CO₂/km for light commercial vehicles to be reached by 2020 in order to align with the EU regulation. The mitigation impact is estimated at 1.7 Mt CO₂ eq in 2020. Under the second CO₂ Act, fossil fuel importers must offset CO₂ emissions from motor fuels through investment in domestic emission reduction projects financed by a surcharge on imported fuels. The offset will gradually increase from 2 per cent in 2014 to 10 per cent in 2020, and is planned to further increase thereafter as part of the third CO₂ Act. This corresponds to a reduction of 6.5 Mt CO₂ eq over the period 2013–2019, financed with approximately CHF 1 billion by a surcharge on transport fuels levied by the mineral oil industry. The mitigation impact is estimated to be 1.5 Mt CO₂ eq in 2020. The heavy vehicle charge implemented in 2001 promoted a shift in freight transport from road to rail. The mitigation impact is estimated to be 140 kt CO₂ in 2020. The mineral oil tax reduction on biofuels and natural gas incentivizes the use of low-carbon fuels by providing tax reductions for natural and liquefied petroleum gas and a tax exemption for biogas and renewable energy sources, with expected mitigation impacts of 220 kt CO₂ eq in 2020.

49. Despite the implementation of the PaMs described in paragraph 48 above, the transport sector accounted for 31.9 per cent of total GHG emissions in Switzerland in 2015, which is 4.6 per cent higher than in 1990. Road transport is the most significant source of emissions in the sector (97.9 per cent). The ERT noted that the Party had not achieved its interim target under the second CO₂ Act for the transport sector of “no more than 100 per cent of 1990 emissions by 2015”. During the review week, the Party indicated that it is also unlikely to achieve its sectoral target of 10 per cent below the 1990 level by 2020.

50. The NC7 included information on how Switzerland promoted and implemented the decisions of the International Civil Aviation Organization and the International Maritime Organization to limit emissions from aviation and marine bunker fuels. The information

reported covers adopted or planned PaMs concerning aviation and the plan to include aviation in the emissions trading scheme when Switzerland links with the EU ETS. Switzerland also decided to apply the first CO₂ emissions standard for civil aircraft developed by the International Civil Aviation Organization and plans to participate in the Carbon Offsetting and Reduction Scheme for International Aviation. Even though GHG emissions from marine bunker fuels are negligible, Switzerland supports the introduction and further strengthening of obligations to reduce GHG emissions from international navigation through its membership in the International Maritime Organization.

51. **Industrial sector.** Most GHG mitigation PaMs in the industrial sector are implemented under the CO₂ Act and control CO₂ emissions from fossil fuel use. These PaMs are presented together with the cross-sectoral PaMs. The main instruments affecting GHG emissions from industry are the CO₂ levy on heating and process fuels, the emissions trading scheme and the negotiated reduction commitments (for exemption from the CO₂ levy on heating and process fuels). In the period 2013–2020, efforts to harmonize the Swiss emissions trading scheme with the EU ETS have been ongoing and include involving large GHG emitters in the scheme and amending the emission allowance rule, aiming to link the scheme with the EU ETS for the period 2021–2030. This linkage will allow participants in the Swiss emissions trading scheme to use allowances from the EU ETS and vice versa.

(c) Policies and measures in other sectors

52. **Industrial processes.** The main industrial process PaMs have been addressing the reduction of F-gases and NMVOCs that are not covered under the CO₂ Act. Provisions relating to substances stable in the atmosphere (see table 5) consist of a set of regulations to control emissions by limiting the use of the F-gases for which no alternatives are currently available; for example, through consumer awareness by labelling in at least two official languages the use of F-gases in containers and switchgear containing such substances. In view of the need to strengthen the measures on F-gas emissions from refrigerants, a revision of the Ordinance on Chemical Risk Reduction has been prepared and is expected to be implemented in 2019. The revised Ordinance will include measures on refrigerants from smaller installations and systems and a ban on the use of HFCs. Furthermore, a licencing system for the import and export of F-gases will be implemented, as agreed in the Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer. During the review, Switzerland informed the ERT that it had ratified the Kigali Amendment in November 2018. The total mitigation impact on F-gases is estimated to be 895 kt CO₂ eq in 2020. The international exhaust gas regulations, the Ordinance on Air Pollution Control, and the NMVOC incentive fee are aimed at reducing NMVOC emissions by setting emission limits for motor vehicles and stationary installations and by using market-based instruments. The estimated GHG mitigation impact by reducing indirect CO₂ emissions is 580 kt CO₂ eq in total in 2020.

53. **Agriculture.** The Agriculture Act, which came into force in 1999 and was amended in 2014, focuses on the sustainable use of natural resources and animal-friendly and climate-friendly production. In Switzerland, farmers are eligible for direct payments when they fulfil the ‘proof of ecological performance’ through, for example, ensuring an ecologically appropriate soil nutrient balance, setting aside a suitable proportion of ecological compensation areas, having a crop rotation system in place, ensuring soil protection, selectively applying crop protection agents and developing ecological ways for animal husbandry. This measure is widespread because it provides an essential part of the income of most farmers, who have experienced a substantial reduction in price support and subsidies (from over CHF 8 billion in 1990 to CHF 5.6 billion in 2010) and indirect support such as restrictions on import and export subsidies (which decreased by around 50 per cent over the same period). The proof of ecological performance is expected to produce a mitigation impact in the order of 700 kt CO₂ eq in 2020. The resource programme (subsidies for more efficient use of natural resources) deals with emission reductions from the application of fertilizers, biodiversity and energy efficiency.

54. The climate strategy for agriculture intends to reduce GHG emissions from agriculture by one third by 2050 compared with the 1990 level through technical, operational and

organizational measures and by another third through measures influencing food production and consumption. Strengthening the reduction target mandatorily included in the third CO₂ Act is also planned. The further development of the direct payments system (with an orientation towards targets), in particular with additional funds for environmentally friendly production systems and for the efficient use of resources, is expected to result in a mitigation impact of 200 kt CO₂ eq in 2020.

55. The ERT noted that the Party did not describe the estimated changes in activity levels due to the implementation of the proof of ecological performance to receive direct payments or provide a brief description of estimation methods in its NC7. During the review, Switzerland provided an amendment to the NC7, in which the Party explained that the measure brought about a substantial decrease in the total number of cattle, which were the main drivers of agricultural GHG emissions in the 1990s, by 14 per cent from 1990 to 2000, and the total use of commercial fertilizer decreased by 23 per cent over the same period.

56. **LULUCF.** Switzerland is equipped with three main national-level legal instruments. The Forest Act, covering sustainable forest management and forest area conservation, prohibits clear-cutting and deforestation unless the area is replaced by an equal area of afforestation or an equivalent measure to improve biodiversity. The annual increment of stock is 10.4 million m³, and 1.5 million m³ remain unlogged annually. The Wood Action Plan aims at the better use of the wood harvest potential by promoting the optimized use of harvested wood (as material during its lifetime and as energy source at the end of its life); climate-appropriate building and refurbishment; and communication, knowledge transfer and cooperation. The Forest Policy 2020 aims at improving the conditions for an efficient and innovative forestry and wood industry. The mitigation impact is estimated at 1.2 Mt CO₂ eq and relates to the substitution of wood for fossil fuels, for example for heating or for replacing concrete in the building sector. The current Forest Act was revised and entered into force in January 2017, which is the most recent change since the reporting of the NC6. The Act aims at increasing resilience to climate change and promoting the use of sustainably produced timber and the use of wood as a substitute for carbon-intensive resources.

57. The ERT noted that mitigation impacts of the Wood Action Plan and the Forest Act had not been reported and no explanation as to why the mitigation impacts could not be estimated was provided in the NC7. During the review, Switzerland provided an amendment to the NC7, in which it explained that it is difficult to define scenarios for those measures that include elements such as “avoiding natural disturbances”, “adaptation of forests” and “optimised cascaded use of domestic wood” because these include many speculative assumptions. The Party also explained that the mitigation impacts of these elements are of minor importance for Switzerland’s national CO₂ budget. In the amendment, the Party further explained that the estimated mitigation impact (1.2 Mt CO₂ eq) is the indirect (or substitution) effect of the measures within the Forest Policy 2020, and the amount corresponds to energy and material substitutions (see para. 56 above). Switzerland also indicated that, although a quantification is challenging, there are plans to explore ways of quantifying the mitigation effect in the context of the establishment of the forest reference level.

58. **Waste management.** In Switzerland, the landfilling of combustible waste is prohibited. Therefore, all combustible waste is recycled or incinerated in waste incineration plants and the combustion heat is used to generate electricity or to supply district heating networks and industrial facilities. The mitigation impact of this measure is estimated to be 177 kt CO₂ eq by 2020. In 2015, 53 per cent of the total municipal solid waste was collected separately and recycled. The Ordinance on the Avoidance and Management of Waste enforces the optimization of energy recovery by municipal solid waste incineration plants. A minimum energy recovery rate of 55 per cent of the energy content of the waste incinerated will be mandatory from 1 January 2026. All 30 Swiss municipal solid waste incineration plants are supplying energy in the form of either electricity or heat for district heating, equivalent to around 2 per cent of Switzerland’s total energy consumption. The mitigation impact of the Ordinance is estimated to be 28 kt CO₂ eq by 2020 with additional gains coming after 2020. In Switzerland, waste treatment is financed on the basis of the polluter pays principle. In 2011, around 80 per cent of Swiss residents paid for their waste disposal entirely

or in part through volume-based charges, and the remaining 20 per cent paid for it through taxation or a flat fee.

(d) Minimization of adverse impacts in accordance with Article 2 and Article 3, paragraph 14, of the Kyoto Protocol

59. In the NC7 Switzerland reported information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and effects on international trade and social, environmental and economic impacts on other Parties, especially developing country Parties.

60. Further information on how Switzerland strives to implement its commitments under Article 3, paragraph 14, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties was reported in the 2018 annual submission. The Party reported on the assessment of economic and social consequences of response measures, adverse effects of climate change, the minimization of effects on international trade and social, environmental and economic impacts on other Parties. The reporting included information on cooperation on the development of technologies and assisting developing Parties that are highly dependent on the export of fossil fuels in diversifying their economies.

(e) Assessment of adherence to the reporting guidelines

61. The ERT assessed the information reported in the NC7 of Switzerland and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

C. Projections and the total effect of policies and measures, including information on supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

1. Projections overview, methodology and results

(a) Technical assessment of the reported information

62. Switzerland reported updated projections for 2020, 2025 and 2030 relative to actual inventory data for 2015 under the WEM scenario. The WEM scenario reported by Switzerland includes implemented and adopted PaMs at the time of the drafting of the NC7.

63. In addition to the WEM scenario, Switzerland reported the WAM and WOM scenarios. The WAM scenario includes planned PaMs, while the WOM scenario excludes all PaMs implemented, adopted or planned from 1990 onward for the energy sector, F-gas related emissions, the waste sector and indirect CO₂ emissions; from 2011 onward for the agriculture sector; and from 2015 onward for the LULUCF sector. During the review, Switzerland provided an amendment to the NC7 in order to enhance transparency. In this amendment, it is explicitly indicated that the starting year for both the WEM and the WAM scenarios is 2015, with the WAM scenario increasingly deviating from the WEM scenario as planned PaMs deliver results.

64. Switzerland provided a definition of its scenarios, explaining that its WEM scenario includes implemented and adopted policies. The policies with the greatest impacts are cross-cutting policies such as the CO₂ Act and the CO₂ levy on heating and process fuels and its associated negotiated reduction commitments, but there are also some energy combustion related PaMs, such as those targeting buildings and vehicle use efficiency. Switzerland's WAM scenario is mostly based on the planned strengthening of existing PaMs. The definitions indicate that the scenarios were prepared according to the UNFCCC reporting guidelines on NCs.

65. The projections are presented on a sectoral basis, using the same sectoral categories as those used in the reporting on mitigation actions, and on a gas-by-gas basis for CO₂, CH₄,

N₂O, PFCs, HFCs (treating PFCs and HFCs collectively in each case), SF₆ and NF₃. The projections are provided in an aggregated format for each sector as well as for a Party total using GWP values from the Fourth Assessment Report of the IPCC. Projections in the NC7 are presented together with actual data for 1990–2015.

66. Switzerland did not report emission projections for indirect GHGs such as carbon monoxide, nitrogen oxides, NMVOCs or sulfur oxides, but did report projections for indirect CO₂ emissions.

67. Emission projections related to fuel sold to ships and to aircraft engaged in international transport were reported separately and were not included in the totals. Switzerland reported on factors and activities affecting emissions for each sector.

(b) Methodology, assumptions and changes since the previous submission

68. The methodology used for the preparation of the projections is different from that used for the preparation of the emission projections for the NC6 for the energy sector, whereas it is similar or the same for the other sectors. Switzerland reported supporting information further explaining the methodologies and the changes made since the NC6. In order to enhance transparency, the Party provided an amendment to the NC7 during the review. In this amendment, Switzerland estimated the scale of the changes as percentages and submitted a graph showing these changes in both levels and trajectories up to 2030 for the three relevant scenarios (WEM, WAM and WOM).

69. Projections in the NC7 result from a computable general equilibrium model from EPFL and INFRAS (2016) for the energy combustion sector, including transport, instead of the 2012 Prognos model based on energy demand used for projections in the NC6. Moreover, for transport, the future demand was reconsidered in the NC7 by reducing the projected consumption of biofuels and by using more realistic assumptions for the share of electric vehicles. With regard to fuel sold to ships and to aircraft engaged in international transport, the WOM scenario was reconsidered. For the other sectoral categories, the revised NC7 projections were mainly updates made in the light of the latest inventory data submitted in 2017 covering the period 1990–2015.

70. To prepare its projections for the period 2015–2030, Switzerland relied on the following key underlying assumptions, which were applied for all three reported scenarios: Switzerland's population would rise by 14.5 per cent, or 0.9 per cent/year on average compared with the 1.0 per cent observed between 2000 and 2015; and GDP would increase by 23.7 per cent or 1.4 per cent/year on average compared with the 1.7 per cent observed between 2000 and 2015. For the transport sector, which represents a significant share of Switzerland's GHG emissions, it is assumed that passenger transport in vehicle-kilometres would increase by 9.7 per cent in line with the number of registered passenger cars, that is, vehicle-kilometres would remain almost constant. With regard to price assumptions between 2015 and 2030, Switzerland anticipates a 149 per cent increase in crude oil prices and a 59 per cent increase in the EU import price for natural gas (both in real terms). These variables and assumptions were reported in CTF table 5 and were updated since the projections reported in the NC6 on the basis of the most recent economic developments known at the time of the preparation of the projections.

71. Switzerland provided information in its NC7 and in CTF table 5 of the BR3 on key variables and assumptions relevant for the preparation of all three reported projection scenarios. During the review, Switzerland provided an amendment to the NC7, in which it further specified how key underlying assumptions were estimated. Moreover, in its NC7, Switzerland described on a sectoral basis the drivers, factors and activities behind the expected GHG emission developments for each of the three projection scenarios, and referred to supporting documentation.

72. Sensitivity analyses were conducted for a number of important assumptions, such as GDP, international prices of oil and gas, and technological progress through energy efficiency. However, the results of the analyses were only briefly reported in the NC7. In addition, a reference document for these analyses stipulates “the sensitivity analyses are restricted to comparing sensitivity scenarios” (EPFL and INFRAS, 2016, p.81). During the

review, Switzerland provided an amendment to the NC7, in which it further described the analyses, as well as the reason why the exercise was restricted to comparing sensitivity scenarios. Although the ERT recognizes that the amendment clarifies the work done with regard to sensitivity analyses, it notes that the work remains limited and lacks explanations of underlying assumptions (e.g. on bottom-up estimates of the mitigation impacts of non-price PaMs).

(c) Results of projections

73. The projected emission levels under different scenarios and information on the Kyoto Protocol targets and the quantified economy-wide emission reduction target are presented in table 6 and the figure below. Switzerland established a QELRC of 84.2 per cent compared with the 1990 level, or –15.8 per cent, for the second commitment period of the Kyoto Protocol (2013–2020). This QELRC implements Switzerland’s quantified economy-wide emission reduction target of 20 per cent below the 1990 level to be reached by 2020. That means that Switzerland will assess the fulfilment of the quantified economy-wide emission reduction target under the Convention by accounting against its QELRC under the second commitment period of the Kyoto Protocol. Consequently, by reaching its QELRC under the second commitment period of the Kyoto Protocol, Switzerland will also consider the quantified economy-wide emission reduction target under the Convention as fulfilled.

74. Total emissions without LULUCF are relevant for Switzerland’s emission reduction targets. However, Switzerland indicates in its NC7 that it will account for the contribution of the LULUCF sector using an activity-based approach that includes afforestation, reforestation and deforestation in line with accounting under Article 3, paragraph 3, of the Kyoto Protocol and forest management under Article 3, paragraph 4, of the Kyoto Protocol. The estimated cumulative net contribution of LULUCF for the period 2013–2016 is equivalent to –1,653.5 kt CO₂ eq. Indirect CO₂ emissions from the energy, IPPU, agriculture and waste sectors are included in Switzerland’s emission reduction targets (there are currently no emissions from agriculture explicitly reported as indirect CO₂ emissions). As emissions from the sector other are not considered for Switzerland’s emission reduction targets, the corresponding indirect CO₂ emissions from this sector are also excluded. Taking these into consideration, Switzerland’s total GHG emissions covered by its quantified economy-wide emission reduction target including LULUCF (by activity-based approach) were 11.2 per cent below the base-year level in 2016.

Table 6
Summary of greenhouse gas emission projections for Switzerland

	<i>GHG emissions (kt CO₂ eq per year)</i>	<i>Changes in relation to base-year^a level (%)</i>	<i>Changes in relation to 1990 level (%)</i>
Kyoto Protocol base year ^b	53 706.73	NA	NA
Quantified emission limitation or reduction commitment under the Kyoto Protocol (2013–2020)	45 221.07	–15.8	–15.9
Assigned amount ^c	361 768.52		
Quantified economy-wide emission reduction target under the Convention ^d	NA	–20.0	–20.0
Inventory data 1990 ^e	53 755.30	0.09	NA
Inventory data 2015 ^e	48 137.82	–10.37	–10.45
WOM projections for 2020 ^f	56 069.58	4.40	4.31
WEM projections for 2020 ^f	46 039.61	–14.28	–14.35

	GHG emissions (kt CO ₂ eq per year)	Changes in relation to base-year ^a level (%)	Changes in relation to 1990 level (%)
WAM projections for 2020 ^f	45 783.74	-14.75	-14.83
WOM projections for 2030 ^f	53 759.36	0.10	0.01
WEM projections for 2030 ^f	41 787.95	-22.19	-22.26
WAM projections for 2030 ^f	35 074.96	-34.69	-34.75

^a “Base year” in this column refers to the base year used for the target under the Kyoto Protocol, while for the target under the Convention it refers to the base year used for that target.

^b As contained in document FCCC/IRR/2016/CHE.

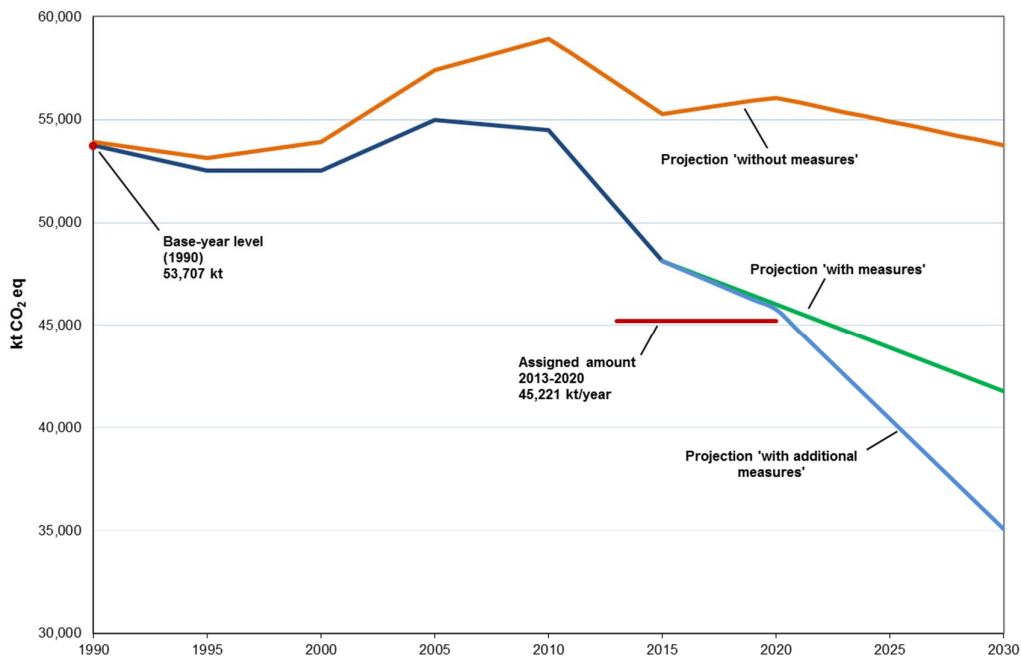
^c As contained in document FCCC/IRR/2016/CHE.

^d The 20 per cent target under the Convention is to be fulfilled through the attainment of the target for the second commitment period of the Kyoto Protocol.

^e From Switzerland’s BR3 CTF table 6(a).

^f From Switzerland’s BR3 CTF table 6.

Greenhouse gas emission projections reported by Switzerland



Source: Switzerland’s NC7 and BR3 CTF table 6; total GHG emissions excluding LULUCF, including indirect CO₂ emissions.

75. Switzerland’s total GHG emissions excluding LULUCF are projected to be 46,039.61 and 41,787.95 kt CO₂ eq in 2020 and 2030, respectively, under the WEM scenario, which is a decrease of 14.4 and 22.3 per cent, respectively, below the 1990 level. Under the WAM scenario, GHG emissions excluding LULUCF in 2020 and 2030, amounting to 45,783.74 and 35,074.96 kt CO₂ eq, respectively, are projected to be lower than those in 1990 by 14.8 and 34.8 per cent, respectively.

76. The 2020 projections suggest that Switzerland may face challenges in achieving its 2020 target under the Convention.

77. Switzerland presented the WEM and WAM scenarios by sector for 2020 and 2030, as summarized in table 7.

Table 7
Summary of greenhouse gas emission projections for Switzerland presented by sector

Sector	GHG emissions and removals (kt CO ₂ eq)					Change (%)			
	1990	2020		2030		1990–2020		1990–2030	
		WEM	WAM	WEM	WAM	WEM	WAM	WEM	WAM
Energy (not including transport)	27 186.24	20 600.43	20 599.44	19 231.95	14 027.33	–24.2	–24.2	–29.3	–48.4
Transport	14 659.85	14 847.74	14 728.73	12 877.75	11 922.94	1.3	0.5	–12.2	–18.7
Industry/industrial processes	3 585.03	3 731.98	3 596.11	2 901.34	2 732.03	4.1	0.3	–19.1	–23.8
Agriculture	6 780.39	5 954.72	5 954.72	5 892.20	5 507.95	–12.2	–12.2	–13.1	–18.8
LULUCF	–278.74	959.28	1 909.28	909.28	2 459.28	444.1	785.0	426.2	982.3
Waste	1 132.92	792.96	792.96	773.66	773.66	–30.0	–30.0	–31.7	–31.7
Indirect CO ₂ emissions from energy, transport, industry/industrial processes, agriculture ^a and waste	410.88	111.78	111.78	111.05	111.05	–72.8	–72.8	–73.0	–73.0
Total GHG emissions without LULUCF	53 755.30	46 039.61	45 783.74	41 787.95	35 074.96	–14.4	–14.8	–22.3	–34.8

Source: Switzerland's BR3 CTF table 6.

^a No indirect CO₂ emissions under the agriculture sector are included.

78. According to the projections reported for 2020 under the WEM scenario, the most significant emission reductions are expected to occur in the energy sector (excluding transport) and the agriculture sector, amounting to projected reductions of 6,585.81 kt CO₂ eq (24.2 per cent) and 825.67 kt CO₂ eq (12.2 per cent), respectively, between 1990 and 2020. Some reductions are also expected to occur in the waste sector and the indirect CO₂ emissions, amounting to 339.96 kt CO₂ eq (30.0 per cent) in the waste sector and 299.10 kt CO₂ eq (72.8 per cent) in indirect CO₂ emissions, respectively, between 1990 and 2020.

79. The trend in projected emissions between 2020 and 2030 under the same scenario is significantly different. The main decrease in emissions is expected to come from the transport sector, with an absolute decrease of 1,969.99 kt CO₂ eq in 2030 compared with the projected emissions in 2020, or a decrease of 1,782.10 kt CO₂ eq (12.2 per cent) from the 1990 level in 2030. Emissions from the transport sector in 2020 are projected to be 1.3 per cent more than in 1990. However, when compared with 2008,³ the year these emissions reached their highest level, projections indicate that the emissions would be 10.8 per cent and around 22.6 per cent lower in 2020 and 2030, respectively. This reflects that PaMs with the most mitigation potential – CO₂ emission regulations for newly registered vehicles and the partial compensation of CO₂ emissions from motor fuel use – were implemented in 2012–2013 and started to deliver emission reductions only from then onward, with the largest projected decline in emissions occurring after 2015.

³ According to version 2 of the common reporting format tables of the 2018 annual GHG inventory submission of Switzerland.

80. A similar observation is made for the IPPU sector. The WEM scenario indicates that emissions in 2020 are expected to exceed the 1990 level (an increase of 4.1 per cent), while a substantial decrease is expected to occur between 2020 and 2030, with an absolute decrease of 830.64 kt CO₂ eq in 2030 compared with the projected emission level in 2020, or 683.69 kt CO₂ eq (a reduction of 19.1 per cent) compared with the 1990 level. The drivers of the decrease to 2030 are mainly a reduction in HFC consumption and expected declines in the production of mineral products (e.g. cement, bricks and tiles) and metals. For the other sectors with declining emissions, Switzerland projects that they will continue to decline between 2020 and 2030, with the greatest mitigation impact observed in the energy sector (excluding transport), where a further reduction in GHG emissions of 1,368.48 kt CO₂ eq is projected in 2030 compared with the 2020 level.

81. If additional measures are considered (i.e. under the WAM scenario), the patterns of emission reductions by 2020 and 2030 presented by sector and by gas remain the same, because the additional measures in Switzerland's WAM scenario mostly comprise the strengthening of existing PaMs.

82. Switzerland presented the WEM and WAM scenarios by gas for 2020 and 2030, as summarized in table 8.

Table 8

Summary of greenhouse gas emission projections for Switzerland presented by gas

Gas	GHG emissions and removals (kt CO ₂ eq)					Change (%)				
	2020		2030		1990–2020		1990–2030			
	1990	WEM	WAM	WEM	WAM	WEM	WAM	WEM	WAM	
CO ₂	44 160.31	37 006.57	36 887.58	33 539.96	27 436.06	–16.2	–16.5	–24.0	–37.9	
CH ₄	6 101.67	4 939.62	4 939.47	4 848.50	4 547.03	–19.0	–19.0	–20.5	–25.5	
N ₂ O	2 828.89	2 319.10	2 318.24	2 301.27	2 162.95	–18.0	–18.1	–18.7	–23.5	
HFCs	0.02	1 492.65	1 365.91	819.53	665.88	7 463 150.0	4 097 55 0.0	6 829 450.0	3 329 300.0	
PFCs	116.52	51.25	51.12	52.13	51.91	–56.0	–56.1	–55.3	–55.4	
SF ₆	137.01	118.15	109.15	115.04	99.60	–13.8	–20.3	–16.0	–27.3	
NF ₃	0.00	0.49	0.49	0.49	0.49	NA	NA	NA	NA	
Indirect CO ₂	410.88	111.78	111.78	111.05	111.05	–72.8	–72.8	–73.0	–73.0	
Total GHG emissions without LULUCF	53 755.30	46 039.61	45 783.74	41 787.95	35 074.96	–14.4	–14.8	–22.3	–34.8	

Source: Switzerland's BR3 CTF table 6.

83. For 2020 the most significant reductions compared with the 1990 level are projected for CO₂ emissions – 7,153.74 kt CO₂ eq (16.2 per cent) – and for CH₄ – 1,162.05 kt CO₂ eq (19.0 per cent). For 2030 the most significant reductions are projected for CO₂ emissions, with an additional reduction of 3,466.61 kt CO₂ eq compared with the 2020 level, or a decrease of 24.0 per cent compared with the 1990 level. HFCs would also experience a sharp reduction of 673.12 kt CO₂ eq compared with the 2020 level, that is, emissions almost halve between 2020 and 2030.

84. If additional measures are considered (i.e. under the WAM scenario), the patterns of emission reductions by 2020 presented by sector and by gas remain the same, with the largest reductions in CO₂ emissions of 7,272.73 kt CO₂ eq (16.5 per cent) in the period 1990–2020 and 16,724.25 kt CO₂ eq (37.9 per cent) in the period 1990–2030.

85. Considering the key underlying assumptions and value variables used for the modelling of Switzerland’s GHG projections, the ERT concluded that it is through its PaMs that the Party would succeed in reducing its emissions. Indeed, main assumptions, such as population and GDP, show an increasing trend from 2015 to 2020, and the trend will continue with lower rates of growth towards 2030.

(d) Assessment of adherence to the reporting guidelines

86. The ERT assessed the information reported in the NC7 of Switzerland and identified issues relating to transparency and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 9.

Table 9

Findings on greenhouse gas emission projections reported in the seventh national communication of Switzerland

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	Reporting requirement specified in paragraph 46 Issue type: transparency Assessment: encouragement	Switzerland reported limited information on the results of its sensitivity analyses in its NC7, although it did conduct a sensitivity analysis on the projections for various assumptions such as GDP and international oil and gas prices. During the review, Switzerland provided an amendment to the NC7, in which the Party explained that the sensitivity analyses conducted were for comparing sensitivity scenarios. The ERT commends Switzerland for this supplementary information. However, as the details have to be obtained from a technical report (EPFL and INFRAS, 2016), it remains difficult to circumscribe the underlying assumptions and it is not always straightforward to analyse the linkages between the underlying assumptions and the reported projections. For example, the non-price bottom-up PaMs are listed in table 1 in the executive summary of EPFL and INFRAS (2016), whereas the sensitivity analysis is to be found in chapter 5 of that publication, which made it difficult for the ERT to assess the underlying assumptions on bottom-up estimates of the impact of non-price PaMs. The ERT encourages Switzerland to enhance the transparency of the reporting in its next NC by reconsidering ways of presenting the information, notably to better explain the implication of underlying assumptions on the projections.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

2. Assessment of the total effect of policies and measures

(a) Technical assessment of the reported information

87. In the NC7 Switzerland presented the estimated and expected total effect of implemented, adopted and planned PaMs. Information is presented in terms of GHG emissions avoided or sequestered, by gas and by sector (on a CO₂ eq basis), in 2020, 2025 and 2030.

88. Switzerland reported that the total estimated effect of its adopted and implemented PaMs is 10,000 kt CO₂ eq in 2020 and 12,000 kt CO₂ eq in 2030 (not cumulative). For planned PaMs, Switzerland reported additional effects compared with the adopted and implemented PaMs of 300 kt CO₂ eq in 2020 and 6,700 kt CO₂ eq in 2030 (not cumulative). According to the information reported in the NC7, PaMs implemented in the energy sector will deliver the largest emission reductions, followed by PaMs implemented in the agriculture sector. The ERT commends Switzerland for providing the aggregate effect of PaMs by sector, not only by gas.

89. The ERT noted that, for estimating the aggregated effect of PaMs, the transport sector is not distinguished from the energy sector. The ERT also noted that Switzerland reported the mitigation effect of the measures within the Forest Policy 2020 (estimated mitigation impact of 1.2 Mt CO₂ eq in 2020) in the PaMs chapter of its NC; that is, this effect is not reported in the projections chapter where the aggregated effects of implemented PaMs are

estimated. During the review, Switzerland provided an amendment to the NC7, in which the Party explains that the estimated mitigation impact reported is actually an estimate of the indirect (or substitution) effects of the measures within the Forest Policy 2020. The amount corresponds to energy substitution (replacing fossil fuels with wood for heating) as well as to material substitution (e.g. replacing concrete with wood). Further, the Party explains that this may lead to some overlap with the individual estimates of the mitigation impacts for PaMs in other sectors, therefore, in order to avoid double counting, the mitigation effect resulting from the substitution of materials and fossil fuels with wood has not been accounted for under the WEM and WAM scenarios for the LULUCF sector.

90. Table 10 provides an overview of the total effect of PaMs as reported by Switzerland.

Table 10

Projected effects of Switzerland's planned, implemented and adopted policies and measures by 2020 and 2030

Sector	2020		2030	
	<i>Effect of implemented and adopted measures (kt CO₂ eq)</i>	<i>Effect of planned measures (kt CO₂ eq)</i>	<i>Effect of implemented and adopted measures (kt CO₂ eq)</i>	<i>Effect of planned measures (kt CO₂ eq)</i>
Energy (without transport)	8 400	100	9 500	6 200
Transport ^a	IE	IE	IE	IE
Industrial processes	900	100	1 800	200
Agriculture	200	0	200	400
Land-use change and forestry	NE	NE	NE	NE
Waste management	200	0	100	0
Indirect CO ₂ from energy, transport, industry/industrial processes, agriculture ^b and waste	400	0	400	0
Total	10 000	300	12 000	6 700

Source: Switzerland's NC7, where figures are rounded and expressed in Mt CO₂ eq.

Note: The total effect of implemented and adopted PaMs is defined as the difference between the WOM and the WEM scenario; the total effect of planned PaMs is defined as the difference between the WEM and the WAM scenario.

^a The notation key "IE" is used for transport because an aggregated effect is presented for the energy sector as a whole, that is, including transport.

^b No indirect CO₂ emissions under the agriculture sector are included.

(b) Assessment of adherence to the reporting guidelines

91. The ERT assessed the information reported in the NC7 of Switzerland and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

3. Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

(a) Technical assessment of the reported information

92. In the NC7 Switzerland provided information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. The ERT noted that in the NC7 the Party indicated that the second CO₂ Act, which is the current legal

basis for Switzerland's climate policy and actions, aims to enable Switzerland to attain its target to reduce domestic GHG emissions by 20 per cent below the 1990 level by 2020. Nonetheless, Switzerland plans to use market-based mechanisms to meet its target under the second commitment period of the Kyoto Protocol, mainly certified emission reductions, but potentially emission reduction units and units from other market-based mechanisms.

93. Some of Switzerland's PaMs are designed to include the use of market-based mechanisms to meet emission reduction obligations. These policies include the emissions trading scheme, the obligation to offset emissions from gas-fired combined-cycle power plants, negotiated reduction commitments for exemption from the CO₂ levy on heating and process fuels, and the partial compensation for CO₂ emissions from motor fuel use. For those measures, except for the obligation to offset emissions from gas-fired combined-cycle power plants, the use of international carbon credits will be allowed only when agreed or considered as the sanction mechanism when the targets are not achieved. Switzerland indicated that it will use additional units from market-based mechanisms when necessary to meet the differences between its domestic emission reduction target for 2020 and the QELRC for the second commitment period (2013–2020) of the Kyoto Protocol.

94. On its use of the market-based mechanisms, Switzerland may use its own units carried over from the first commitment period of the Kyoto Protocol; however, domestic legislation does not permit Switzerland to use carried-over units transferred from other Parties for compliance under Article 3 of the Kyoto Protocol for the second commitment period.

(b) Assessment of adherence to the reporting guidelines

95. The ERT assessed the information reported in the NC7 of Switzerland and recognized that the reporting is complete, transparent and adhering to the reporting guidelines for supplementary information. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

D. Provision of financial and technological support to developing country Parties, including information under Articles 10 and 11 of the Kyoto Protocol

1. Financial resources, including under Article 11 of the Kyoto Protocol

(a) Technical assessment of the reported information

96. Switzerland reported information on the provision of financial support required under the Convention and its Kyoto Protocol, including on financial support provided and committed, allocation channels and annual contributions.

97. Switzerland indicated what "new and additional" financial resources it has provided and clarified how it has determined such resources as being "new and additional". In its NC7, the Party explained that its financial resources are considered new and additional on the basis of the Swiss Parliament decision in 2011 to raise the level of official development assistance to 0.5 per cent of gross national income by 2015 and the Party's enhanced focus on climate change in its development assistance to support more climate-relevant and 'climate proofing' programmes and projects in developing countries. During the review, the Party explained that, in each new budget cycle, it makes new commitments for the support of climate action (provided and mobilized) in its partner countries; therefore, the support can always be considered as new. The ERT noted that the increase, over time, in the provision of public climate finance resources is considered as additional; however, it may not necessarily be considered as new.

98. Switzerland described how its resources address the adaptation and mitigation needs of non-Annex I Parties. It also described how those resources assist non-Annex I Parties to mitigate and adapt to the adverse effects of climate change, facilitate economic and social response measures and contribute to technology development and transfer and capacity-building related to mitigation and adaptation.

99. Switzerland reported information on the assistance that it has provided to developing country Parties that are particularly vulnerable to the adverse effects of climate change to help them to meet the costs of adaptation to those adverse effects; however, the ERT noted that the financial support for adaptation in the least developed countries has decreased by around 9 per cent in recent years. The ERT also noted that Switzerland did not provide any voluntary contribution to the Adaptation Fund during the period 2014–2016 (see para. 102 below).

100. With regard to the most recent financial contributions aimed at enhancing the implementation of the Convention by developing countries, Switzerland reported that its climate finance has been allocated on the basis of priority areas, strategies and programmes. Three government entities – the Swiss Agency for Development and Cooperation, the State Secretariat for Economic Affairs, and the Federal Office for the Environment – have specific roles and dedicated budgets in this area. They cooperate closely to ensure the overall effectiveness and coherence of Swiss support for climate change adaptation and mitigation activities in developing countries and countries with economies in transition.

101. Switzerland explained in its NC7 that, through demand-driven planning dialogues with recipient countries, the needs and priorities of those recipient countries are assessed every four years. On the adequacy of the provision of climate finance support for developing countries, the ERT noted that Switzerland explained in its NC7 that it is making the greatest possible effort to act in accordance with Article 4, paragraph 3, of the Convention, despite its budget constraints, which affect official development assistance spending. During the review, the Party further explained that it builds its bilateral cooperation through dialogue and consultation with its recipient partner countries on their needs and priorities, which ensures needs and priorities are country-driven and complementary to other ongoing relevant activities in a partner country. In addition, this process ensures that the support provided by Switzerland adequately responds to its partner countries' needs and maximizes the sustainability and durability of climate action on the ground. Table 11 includes the information reported by Switzerland on its provision of financial support.

Table 11

Summary of information on provision of financial support by Switzerland in 2013–2016

(Millions of United States dollars)

<i>Allocation channel of public financial support</i>	<i>Year of disbursement</i>			
	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>
Official development assistance	2 505.6	2 778.5	2 726.5	2 772.5
Climate-specific contributions through multilateral channels, including:	30.4	20.8	55.0	59.4
Global Environment Facility	16.9	17.4	22.0	21.9
Least Developed Countries Fund	1.1	1.1	1.0	1.8
Special Climate Change Fund	1.3	1.4	1.3	0.5
Adaptation Fund	10.8	0.0	0.0	0.0
Green Climate Fund	0.0	0.5	30.0	34.2
Trust Fund for Supplementary Activities	0.2	0.2	0.3	0.3
Financial institutions, including regional development banks	64.8	74.3	67.3	64.2
United Nations bodies	0.0	0.0	8.9	12.6
Other	1.9	1.9	0.3	0.8

Allocation channel of public financial support	Year of disbursement			
	2013	2014	2015	2016
Climate-specific contributions through bilateral, regional and other channels	184.0	201.9	173.2	202.3

Sources: (1) Query Wizard for International Development Statistics, available at <http://stats.oecd.org/qwids/>; (2) Switzerland's BR3 CTF tables.

102. Switzerland has increased its contributions steadily over recent years, and the annual average of total financial support provided by Switzerland through multilateral, bilateral, regional and other channels as reported in the NC7 increased by 126.5 per cent compared with the annual average as reported in the NC6. Switzerland reported in its NC7 that its climate finance support for mitigation increased from USD 72 million in 2013 to USD 100 million in 2016 while during the same period, the Party's specific support for bilateral adaptation activities was reduced from USD 112 million in 2013 to USD 102 million in 2016. During the review, Switzerland explained that it strives for an adaptation share of at least 50 per cent in the overall finance provided. The Party also explained that given a considerable share of bilateral Swiss climate finance goes to the least developed countries and African States, the adaptation share tends to be higher than the mitigation share. The Party also indicated that, despite the increase in financial support as a whole, the government budget cuts had an impact on the Swiss Agency for Development and Cooperation, which has been operating more in rural areas, where the demand for support for adaptation has been traditionally higher than for mitigation. As a result, climate finance resources slightly decreased for adaptation, even though the overall climate finance resources increased significantly.

(b) Assessment of adherence to the reporting guidelines

103. The ERT assessed the information reported in the NC7 of Switzerland and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

2. Technology development and transfer, including information under Article 10 of the Kyoto Protocol

(a) Technical assessment of the reported information

104. Switzerland provided information on steps, measures and activities related to technology transfer, access and deployment benefiting developing countries, including information on activities undertaken by the public and private sectors. Switzerland provided examples of support provided for the deployment and enhancement of the endogenous capacities and technologies of non-Annex I Parties.

105. In the area of technology transfer, Switzerland's private sectors are playing a leading role with their know-how, innovation and financing capacities, supported by various initiatives. Switzerland Global Enterprise⁴ supports the private sector in disseminating information on technologies and solutions provided by Swiss companies. Swiss Export Risk Insurance supports Swiss companies in reducing barriers for exporting their technologies such as hydropower. Through such measures, the Party combines the business opportunities of Swiss companies with the needs of developing country Parties for environmentally friendly technology transfer and development.

106. Switzerland reported in its NC7 examples of the measures it has taken to promote, facilitate and finance the transfer and deployment of climate-friendly technologies. The Party also provided information on its success and failure stories in technology transfer using the format of table 6 of the UNFCCC reporting guidelines on NCs. These include activities for the diffusion of energy-efficient technologies in developing countries under the Renewable

⁴ See <https://www.s-ge.com/en/sbh>.

Energy and Energy Efficiency Promotion in International Cooperation platform, the application of cleaner production and resource efficiency in the construction sector and activities carried out through the Climate Technology Centre and Network.

107. The ERT noted that Switzerland did not provide information in CTF table 8. Switzerland reported in the NC7 on technology transfer and development on a bilateral (tables 46–49) and a multilateral (tables 50–53) basis. Switzerland provided qualitative information on supported projects and activities with components of technology transfer in order to address the recommendation made in the report on the technical review of the BR2 to provide CTF table 8.

108. Switzerland provided information on steps taken to promote, facilitate and finance the transfer of technology to developing countries and to build their capacity in order to facilitate implementation of Article 10 of the Kyoto Protocol, such as the project aiming to establish low-carbon cement in the market as mainstream cement type.

(b) Assessment of adherence to the reporting guidelines

109. The ERT assessed the information reported in the NC7 of Switzerland and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

E. Vulnerability assessment, climate change impacts and adaptation measures

1. Technical assessment of the reported information

110. In the NC7 Switzerland provided the required information on the expected impacts of climate change in the country; the adaptation policies covering regional, sectoral and cross-sectoral vulnerabilities and considerations; and an outline of the action taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation. Switzerland provided a description of climate change vulnerability and impacts on a number of areas, the hydrological cycle and water resources, natural hazards, biodiversity and natural ecosystems, agriculture, forest, energy, health, tourism, as well as damages due to extreme events, and highlighted the adaptation response actions taken at the national and cantonal levels of government.

111. Swiss climate change scenarios published in 2011 served as the basis for a variety of climate change impact studies in Switzerland and for framing the national climate adaptation strategy. With the advancement of higher-resolution regional climate model projections and the improvement in scientific understanding of systems affected by climate change, a new generation of climate change scenarios for Switzerland was launched in 2018. The ERT noted that the results presented in the NC7 are based on the scenarios published in 2011 and later extensions.

112. An assessment of present and future climate-related risks and opportunities has been performed for eight case studies in different regions of Switzerland, based on two climate scenarios and a socioeconomic scenario. The case studies looked at the possible impacts of 17 hazards on nine sectors (health, agriculture, forestry, energy, tourism, infrastructure and buildings, water management, biodiversity, and open spaces and green areas) for two different time-horizons. Key risks and opportunities were identified through nationwide assessment of the literature, expert judgment and the findings of the case studies. The ERT commends Switzerland for the progress made in the assessment of risks and opportunities.

113. As part of the Swiss adaptation strategy, an action plan for the period 2014–2019, comprising 63 adaptation measures, was adopted on 9 April 2014. The majority of these measures were in different stages of implementation (completed, advanced stage or early phase) in 2017. In order to incentivize climate change adaptation action at the regional and local level, the pilot programme Adaptation to Climate Change was launched. A total of 31 and 50 projects were selected for funding following the first (for 2014–2016) and the second

(starting 2019) call for projects. Table 12 summarizes the information on vulnerability and adaptation to climate change presented in the NC7 of Switzerland.

Table 12

Summary of information on vulnerability and adaptation to climate change reported by Switzerland

<i>Vulnerable area</i>	<i>Examples/comments/adaptation measures reported</i>
Agriculture and food security	<p><i>Vulnerability:</i> changes in temperature and precipitation have both positive (e.g. longer vegetation periods) and negative (e.g. increasing incidence of pests, increasing water demand) impacts, but overall reduce the reliability of harvests and increase the frequency of conflicts concerning the utilization of water resources.</p> <p><i>Adaptation:</i> optimized use of varieties and breeds, sustainable use of water and soil, improvement of the knowledge base for locally adapted cultivation, improvement of monitoring and early warning, evaluation of the possibility of supporting private risk management (insurance), and enhancement of research.</p>
Biodiversity and natural ecosystems	<p><i>Vulnerability:</i> species distribution shift towards higher elevations, spread of thermophilic species, colonization by new species from warmer areas, phenological shift, upwards shift of the freezing level and snow line, reduced snow depth and snow duration, glacier retreat and massive loss of glacier volume in the Alps.</p> <p><i>Adaptation:</i> biodiversity-friendly control of harmful organisms, climate scenarios for early detection of invasive species and safeguarding of large-scale habitat quality at high altitudes.</p>
Tourism	<p><i>Vulnerability:</i> reduced number of ski resorts due to temperature increase, changes in the natural landscape, rising snowline, and glacier retreat affecting mountain tourism.</p> <p><i>Adaptation:</i> diversification of the touristic offer, support of the improvement of the knowledge base and diffusion of knowledge.</p>
Natural hazards management	<p><i>Vulnerability:</i> increased risk of flooding, increased levels of drought, decreased slope stability and more frequent mass wasting events, and increased threat to alpine routes from rockfalls and rockslides.</p> <p><i>Adaptation:</i> monitoring of natural hazards, coping with extreme events, and robust and adjustable design of protective measures.</p>
Forests and forestry	<p><i>Vulnerability:</i> adversely affected forest ecosystems, reduced provision of goods and services, and changes in tree growth and composition of forests (e.g. more drought-tolerant species).</p> <p><i>Adaptation:</i> enhanced rejuvenation of critical protection forest, and increased resilience and adaptive capacity of climate-sensitive forests and rejuvenation areas.</p>
Human and animal health	<p><i>Vulnerability:</i> projected increase in the frequency and intensity of heatwaves posing a high risk to human and animal health, and additional direct effects of climate change due to increased occurrence of other extreme events such as floods, mudslides and storms.</p> <p><i>Adaptation:</i> information and recommendations for health protection during heatwaves, monitoring and early detection of vector-borne diseases, and early detection of climate-induced health problems of animals.</p>
Water management	<p><i>Vulnerability:</i> increasing level of summer drought, increasing risk of flooding, changes in seasonal flow redistribution, changes in run-off and groundwater tables, increased water temperature, affected navigation due to more frequent and serious low-water events and higher winter flows, and impaired water, soil and air quality.</p> <p><i>Adaptation:</i> early detection of drought, planning instruments for water resources management, framework for catchment-based water resources management, linking of water supply systems, potential water retention reservoirs, regulation of lake discharge, prevention of additional impairment of water quality, deepening of the navigation channel in the Rhine near Basel, etc.</p>

114. Switzerland did not provide a description of international cooperation with non-Annex I Parties in preparing for adaptation to the impacts of climate change in chapter 6,

“Vulnerability, assessment, climate change impacts and adaptation measures”, of its NC7. During the review, Switzerland explained that the information on bilateral cooperation with developing countries on adaptation was reported in chapter 7, “Financial, technological and capacity-building support”. Switzerland also provided an amendment to the NC7, in which one paragraph was added to chapter 6 stating that the information on adaptation cooperation with developing countries is reported in chapter 7 of the NC7. Examples of the climate change adaptation support for developing countries include joint research work between India and Switzerland, under the Indian Himalayas Climate Adaptation Programme (2012–2016), on vulnerability, risks and hazard assessment in the Kullu district, and contribution to the development of a common framework for integrated vulnerability and risk assessment for all Himalayan States, which helped to enable planning and implementation of adaptation action at the State level. Switzerland’s activities with developing countries cover measures for adaptation as well as the prevention and reduction of disaster risks and improve those measures by integrating them into project planning and management. The Can Tho Urban Development and Resilience Project in Viet Nam, undertaken jointly with the World Bank, aims to reduce flood risk, guide urban development, improve connectivity between the city centre and the new low-risk urban development areas, and enhance the capacity of city authorities to manage disaster risk sustainably.

2. Assessment of adherence to the reporting guidelines

115. The ERT assessed the information reported in Switzerland’s NC7 and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

F. Research and systematic observation

1. Technical assessment of the reported information

116. Switzerland provided information on its general policy and funding relating to research and systematic observation and both domestic and international activities, including contributions to the World Climate Programme, the International Geosphere–Biosphere Programme, GCOS and the IPCC. Switzerland also provided information on the identification of opportunities for and barriers to free and open international exchange of data and information and on action taken to overcome such barriers.

117. The ERT noted that in the NC7 the Party indicated that the report published by the Swiss GCOS Office showed some areas for future improvement, where the flow of data could be improved. During the review, the Party submitted an amendment to its NC7, in which it explained that the Swiss GCOS Office plans to reassess the situation with a view to taking appropriate action, based on the GCOS Switzerland Strategy 2017–2026, in order to ensure that standardized observations of all essential climate variables are archived and made freely available to all interested users.

118. Switzerland has implemented and planned international and domestic policies and programmes on climate change research, systematic observation and climate modelling that aim to advance capabilities to predict and observe the physical, chemical, biological and human components of the Earth’s system over space and time. Switzerland reported on the role of federal research programmes in setting research priorities in 11 policy areas. Four programmes that are particularly relevant to climate change are environment, energy, spatial development and mobility, and sustainable transport.

119. Switzerland listed a number of technology-oriented projects that have produced, or are expected to produce, innovative results on mitigation, including an electric drive system for aircraft; an electric bus with no overhead lines for which the technology takes less than one second to connect the bus to charging points along its route to refill its on-board energy storage bank; a CO₂ direct air capture plant; a thermo-magnetic motor; a building stock and methane distribution system (power-to-gas technology for space heating and hot water in

buildings, which is expected to substitute around 11 TWh/year of fossil-derived CH₄ for renewable CH₄); and thermal and electric storage systems in buildings and neighbourhoods.

120. Switzerland reported that its research on mitigation and adaptation includes studies on ways of creating and preserving social capital in climate adaptation policies. However, the Party also indicated in the NC7 that the research community acknowledges the importance of adaptation only to a quite limited extent and that corresponding research should be further encouraged and supported. Furthermore, Switzerland stated that no recent data are available regarding the number of experts involved in sectoral adaptation research.

121. In terms of activities related to systematic observation, Switzerland reported in its NC7 and its amendment on national plans, programmes and support for ground- and space-based climate observing systems, including the use of satellites. Switzerland also reported on challenges related to the maintenance of a consistent and comprehensive observation system. The Party provided information on its national climate observing system (GCOS Switzerland), which serves as the observation and monitoring pillar for the national implementation of the Global Framework for Climate Services, which is coordinated by the National Centre for Climate Services. The Swiss GCOS Office at MeteoSwiss, in close collaboration with its national partner institutions, has recently elaborated a new strategy for the GCOS Switzerland programme for the period 2017–2026. The new strategy emphasizes securing the most important long-term measurement series as well as promoting, for example, the integration of new measurement techniques, an integrative monitoring approach across Earth system cycles and enhanced communication with stakeholders.

122. The NC7 reflects actions taken to support capacity-building of developing countries, such as the provision of funding for scientists from developing countries working on global climate change research. For example, during the period 2011–2017, the CATCOS project was implemented in 10 countries in Africa, South-East Asia, South America and Central Asia, aiming to improve the capacity to obtain high-quality atmospheric and terrestrial observations and to submit these to the GCOS international data centres. Swiss research institutes such as the Swiss Federal Laboratories for Materials Science and Technology implemented the project, which was financed by the Swiss Agency for Development and Cooperation. During the review, the Party submitted an amendment to its NC7, in which it explained that although the CATCOS project came to an end in 2016, twinning activities by Swiss and international partners have continued. In the amendment, the Party also explained it is a member of the European Organisation for the Exploitation of Meteorological Satellites, which contributes to a global infrastructure for monitoring climate from space and provides comprehensive support to developing countries, particularly in Africa.

123. Switzerland provided information related to support for some projects, such as hosting and funding the Mountain Research Initiative, which addresses global change issues in mountain regions around the world, including developing countries, and related to its support for capacity-building in emerging markets and developing countries by contributing to the GCOS Cooperation Mechanism to enhance the quality of climate observations globally.

2. Assessment of adherence to the reporting guidelines

124. The ERT assessed the information reported in the NC7 of Switzerland and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

G. Education, training and public awareness

1. Technical assessment of the reported information

125. In the NC7 Switzerland provided information on its actions relating to education, training and public awareness at the domestic and international level. The Party provided information on the general policy on education, training and public awareness; primary, secondary and higher education; public information campaigns; training programmes;

education materials; resource or information centres; the involvement of the public and non-governmental organizations; and its participation in international activities.

126. Switzerland provided information in its NC7 on services undertaken by competence centres, institutions and programmes that contribute to information generation, awareness-raising and training, including the Federal Office for the Environment and its linkages with the Forum for Climate and Global Change of the Swiss Academy of Sciences and the Advisory Body on Climate Change.

127. Climate change is already widely recognized among the general public as one of the major long-term challenges. Therefore, public awareness-raising campaigns do not specifically focus on climate change, but rather on sustainable development or on the energy sector.

128. Education 21, financed by the Swiss Conference of Cantonal Ministers of Education and the federal offices, provides support for education relating to sustainable development at various levels of education, including primary and secondary, through the provision of teaching materials, information, advice and expertise.

129. In addressing the energy sector, the SwissEnergy Programme, under the auspices of the Swiss Federal Office of Energy, plays a vital role in awareness-raising and information campaigns in the public domain, including nation-wide activities such as Energy Challenge (a major national awareness-raising campaign that started in 2016), and through television commercials, advertisements, video clips, publications, an annual newspaper, websites, social media channels, brochures and leaflets.

130. The Swiss federal education system gives the 26 cantons and their education ministries the authority to make decisions about the school system, including curricula and learning methods, at all levels. Although efforts to harmonize curricula for compulsory education have been made in recent years, a nation-wide assessment of climate education at the primary and secondary school level conducted by the Federal Office for the Environment in 2015 indicated the need to introduce official teaching materials that are more in line with the lower secondary level contents of the national model curricula.

131. Switzerland provided information on its contribution to international education for the sustainable development community, including through Education 21, the Environment and School Initiatives and the Climate-KIC consortium. In addition, Switzerland contributes to the work of the Partnership on Transparency in the Paris Agreement by helping to organize and implement regional workshops for the Cluster Francophone of the Partnership on Transparency in the Paris Agreement.

132. In response to the encouragement to provide information on the participation of the public and non-governmental organizations in the preparation or domestic review of NCs made in the report on the technical review of the NC6, the Party explained that English is not an official language of Switzerland, which is why there is no process in place to involve the public in the preparation of NCs. The Party indicated in the NC7 that public participation in the preparation of NCs is not considered to be either particularly useful or necessary. During the review, the Party explained that it had engaged non-governmental organizations in the preparation of NCs in the past but found that this had not provided added value.

2. Assessment of adherence to the reporting guidelines

133. The ERT assessed the information reported in the NC7 of Switzerland and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

III. Conclusions and recommendations

134. The ERT conducted a technical review of the information reported in the NC7 of Switzerland in accordance with the UNFCCC reporting guidelines on NCs. The ERT concludes that the reported information completely adheres to the UNFCCC reporting

guidelines on NCs and that the NC7 provides an overview of the national climate policy of Switzerland.

135. The information provided in the NC7 includes all of the elements of the supplementary information under Article 7 of the Kyoto Protocol. Supplementary information under Article 7, paragraph 1, of the Kyoto Protocol on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol was provided by Switzerland in its 2017 annual submission.

136. Total GHG emissions excluding emissions and removals from LULUCF decreased by 9.4 per cent between 1990 and 2016, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 11.7 per cent over the same period. Switzerland's total GHG emissions excluding LULUCF covered by its quantified economy-wide emission reduction target were estimated to be 10.1 per cent below the base-year level for the Party's target, whereas total GHG emissions including LULUCF (by activity-based approach) were 11.2 per cent below the base-year level. Emission decreases in the residential and commercial sectors were driven by improved energy efficiency of buildings and improved combustion equipment efficiency, which have more than offset the increase in floor space to be heated. In the energy sector, emissions from non-metallic mineral production have decreased as energy consumption has declined and fuel switching has occurred from coal and fuel oil to other fossil fuels and biomass. Those factors outweighed the increase in emissions from transport resulting from increases in population and economic activity.

137. Switzerland's main policy framework relating to energy and climate change and the key legislation supporting Switzerland's climate change goals is the second CO₂ Act. The mitigation actions with the most significant mitigation impact are the cantonal building codes, CO₂ emission regulations for newly registered vehicles and the CO₂ levy on heating and process fuels.

138. The GHG emission projections provided by Switzerland include those under the WOM, WEM and WAM scenarios. In the three scenarios, emissions are projected to be 4.4 per cent above, 14.3 per cent below and 14.8 per cent below the Kyoto Protocol base-year level in 2020, respectively. On the basis of the reported information, the ERT concludes that Switzerland may face challenges in achieving its 2020 target under the WEM and WAM scenarios.

139. The projections indicate that Switzerland is not on track to meet its Kyoto Protocol target for the second commitment period (15.8 per cent reduction compared with the 1990 level over the period 2013–2020), under the baseline scenario. Switzerland will assess the achievement of its target under the Convention using its target for the second commitment period of the Kyoto Protocol.

140. The NC7 contains information on how the Party's use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. Switzerland is planning to make use of the Kyoto Protocol mechanisms to meet its Kyoto Protocol target.

141. Switzerland continued to provide climate financing to developing countries through multilateral and bilateral cooperation and its membership in the governing bodies of various multilateral institutions, including multilateral development banks, the Green Climate Fund, the Global Environment Facility, the Adaptation Fund and United Nations agencies. Switzerland attaches great importance to increasing the coherence and effectiveness of the mandate for the above-mentioned multilateral climate finance institutions. Furthermore, the establishment of strategic partnerships at all policy levels and the strengthening of dialogue among all stakeholders, including the private sector and non-governmental institutions, are key principles guiding Switzerland's international climate change engagement.

142. Switzerland reported qualitative information on the technology transfer activities and measures and capacity-building programmes and projects it provided in support of developing countries. In the area of technology transfer, the private sector of Switzerland plays a leading role in projects on, for example, the diffusion of energy-efficient technologies and the application of cleaner production and resource efficiency in the construction sector.

143. Switzerland has launched new climate change scenarios, developed a national adaptation strategy and implemented its adaptation action during the period 2014–2019. Key risks and opportunities were identified through nationwide assessment of the literature, expert judgment and the findings of eight case studies that comprehensively assessed the impacts of 17 hazards and their effects in nine sectors. Pilot adaptation programmes are being implemented.

144. In its NC7, Switzerland reported its activities and actions related to research and systematic observation. The ERT acknowledges the role of Swiss institutions in the provision of a wealth of systematic climate observation data to international data centres and of support for scientists and their research in developing countries. Switzerland undertakes a number of technology-oriented research projects and provided in its NC7 informative examples, such as an electric drive system for aircraft, an electric bus with an on-board energy storage bank, a CO₂ direct air capture plant, a thermo-magnetic motor and a power-to-gas technology for space heating and hot water in buildings.

145. In Switzerland, public awareness activities and campaigns focusing on sustainable development and the energy sector in the context of climate change include the activities under the Swiss Energy Programme. Switzerland continues its effort to reinforce its education and training on climate change, including its consideration of the need to introduce official teaching materials more in line with the lower secondary level contents of the national model curricula.

IV. Questions of implementation

146. During the review the ERT assessed the NC7, including the supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol, and the information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, with regard to timeliness, completeness and transparency. No questions of implementation were raised by the ERT during the review.

Annex

Documents and information used during the review

A. Reference documents

2017 GHG inventory submission of Switzerland. Available at <https://unfccc.int/process/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/submissions/national-inventory-submissions-2017>.

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Amendment to the NC7 and BR3 of Switzerland. Available at https://unfccc.int/sites/default/files/resource/Amendment_CHE_NC7_BR3.pdf.

BR3 of Switzerland. Available at <https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/national-communications-and-biennial-reports-annex-i-parties/third-biennial-reports-annex-i>.

BR3 CTF tables of Switzerland. Available at <https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/national-communications-and-biennial-reports-annex-i-parties/third-biennial-reports-annex-i>.

Compilation of economy-wide emission reduction targets to be implemented by Parties included in Annex I to the Convention. Available at <https://unfccc.int/topics/mitigation/workstreams/pre-2020-ambition/compilation-of-economy-wide-emission-reduction-targets-to-be-implemented-by-parties-included-in-annex-i-to-the-convention>.

EPFL and INFRAS. 2016. *Emissions scenarios without measures 1990–2030*. Zurich: INFRAS. Available at <http://goo.gl/5na6D2>.

“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”. Annex to decision 24/CP.19. Available at <http://unfccc.int/resource/docs/2013/cop19/eng/10a03.pdf>.

“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications”. FCCC/CP/1999/7. Available at <http://unfccc.int/resource/docs/cop5/07.pdf>.

“Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol”. Annex to decision 15/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf>.

“Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol”. Annex III to decision 3/CMP.11. Available at <http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf>.

“Guidelines for review under Article 8 of the Kyoto Protocol”. Annex to decision 22/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf>.

“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”. Annex to decision 13/CP.20. Available at <http://unfccc.int/resource/docs/2014/cop20/eng/10a03.pdf>.

IEA. 2018. *Energy Policies of IEA Countries: Switzerland 2018 Review*. Paris: IEA. Available at <https://www.iea.org/publications/countryreviews/>.

NC7 of Switzerland. Available at
http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/624078315_switzerland-nc7-br3-1-che_nc7_br3_2018.pdf.

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<https://unfccc.int/sites/default/files/resource/docs/2018/arr/che.pdf>.

Report on the review of the report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol of Switzerland. FCCC/IRR/2016/CHE. Available at
<https://unfccc.int/sites/default/files/resource/docs/2017/irr/che.pdf>.

Report of the technical review of the second biennial report of Switzerland. FCCC/TRR.2/CHE. Available at
<https://unfccc.int/sites/default/files/resource/docs/2016/trr/che.pdf>.

Report on the technical review of the sixth national communication of Switzerland. FCCC/IDR.6/CHE. Available at
<https://unfccc.int/sites/default/files/resource/docs/2014/idr/che06.pdf>.

Revisions to the guidelines for review under Article 8 of the Kyoto Protocol. Annex I to decision 4/CMP.11. Available at
<http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf>.

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Adrian Schilt (Federal Office for the Environment), including additional material. The following documents¹ were provided by Switzerland:

FOEN. 2013: *Forest Policy 2020 – Visions, objectives and measures for the sustainable management of forests in Switzerland*. Bern, FOEN. www.bafu.admin.ch/ud-1067-e.

FOEN. 2019. *Amendment to Switzerland's Seventh National Communication and Third Biennial Report under the UNFCCC – Fourth National Communication under the Kyoto Protocol to the UNFCCC*. Bern, 3 April 2019.

NCCS (National Centre for Climate Services). 2011. *Swiss Climate Change Scenarios CH2011*. Centre for Climate Systems Modelling/MeteoSwiss/Swiss Federal Institute of Technology/National Centre of Competence in Research Climate/OcCC (Advisory Body on Climate Change). Zurich, Switzerland.

NCCS. 2018. *CH2018 – Climate Change Scenarios for Switzerland*, NCCS, Zurich. ISBN 978-3-9525031-3-3.

SFOE (Swiss Federal Office of Energy). (2018). *Energy Strategy 2050, Monitoring Report 2018 (abridged version)*, inprint, Ittigen, SFOE.

SFOE. 2018. *Analyse des schweizerischen Energieverbrauchs 2000-2017*. (study was commissioned by the SFOE). Ittigen, SFOE.

¹ Reproduced as received from the Party.