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Report on the technical review of the third biennial report of Switzerland

Developed country Parties were requested by decision 2/CP.17 to submit their third biennial report to the secretariat by 1 January 2018. This report presents the results of the technical review of the third biennial report 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".

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Contents

Abbreviations and acronyms

AR	Assessment Report of the Intergovernmental Panel on Climate Change
BR	biennial report
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
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
NMVOC	non-methane volatile organic compound
NO	not occurring
non-Annex I Party	Party not included in Annex I to the Convention
N_2O	nitrous oxide
PaMs	policies and measures
PFC	perfluorocarbon
QELRC	quantified emission limitation or reduction commitment
SF_6	sulfur hexafluoride
UNFCCC reporting guidelines on BRs	"UNFCCC biennial reporting guidelines for developed country Parties"
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 BR3[1] of Switzerland. The review was organized 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 IV: UNFCCC guidelines for the technical review of biennial reports from Parties included in Annex I to the Convention" (annex to decision 13/CP.20).

2. In accordance with the same decision, 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 Zakieldeen (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 BR3 of Switzerland in accordance with the UNFCCC reporting guidelines on BRs (annex I to decision 2/CP.17).

1. Timeliness

5. The BR3 was submitted on 19 December 2017, before the deadline of 1 January 2018 mandated by decision 2/CP.17. The CTF tables were submitted on 19 December 2017. 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 BR3 mostly adheres to the UNFCCC reporting guidelines on BRs.

Table 1
Summary of completeness and transparency of mandatory information reported by Switzerland in its third biennial report

Section of BR	*Completeness*	*Transparency*	*Reference to description of recommendations*
GHG emissions and trends	Complete	Transparent	
Assumptions, conditions and methodologies related to the attainment of the quantified economy-wide emission reduction target	Complete	Transparent	
Progress in achievement of targets	Complete	Transparent	

[1] The BR submission comprises the text of the report and the CTF tables, which are both subject to the technical review.

Section of BR	*Completeness*	*Transparency*	*Reference to description of recommendations*
Provision of support to developing country Parties	Mostly complete	Mostly transparent	Issue 1 in table 11 and issue 1 in table 12

Note: A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in chapter III below. The assessment of completeness and transparency by the ERT in this table is based only on the "shall" reporting requirements.

II. Technical review of the information reported in the third biennial report

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

1. Technical assessment of the reported information

7. Total GHG emissions[2] 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 2 illustrates the emission trends by sector and by gas for Switzerland.

Table 2
Greenhouse gas emissions by sector and by gas for Switzerland for the period 1990–2016

	GHG emissions (kt CO_2 eq)					*Change (%)*		*Share (%)*	
Sector	*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	77.8
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

[2] In this report, the term "total GHG emissions" refers to the aggregated national GHG emissions expressed in terms of CO_2 eq excluding LULUCF, unless otherwise specified. Values in this paragraph are calculated on the basis of the 2018 annual submission, version 2.

	GHG emissions (kt CO_2 eq)					*Change (%)*		*Share (%)*	
Sector	*1990*	*2000*	*2010*	*2015*	*2016*	*1990–2016*	*2015–2016*	*1990*	*2016*
Gas[a]									
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_2O	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 CO_2	**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 CO_2	**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 CO_2.

8. 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.

9. 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.

10. In brief, Switzerland's national inventory arrangements are managed by the Federal Department of the Environment, Transport, Energy and Communications. The second CO_2 Act, which entered into force in 2013, stipulates that the Federal Office for the Environment with the Department of the Environment, Transport, Energy and Communications is responsible for the assessment of matters relating to climate protection. There have been no changes to national inventory arrangements since the previous BR.

2. Assessment of adherence to the reporting guidelines

11. The ERT assessed the information reported in the BR3 of Switzerland and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

B. Quantified economy-wide emission reduction target and related assumptions, conditions and methodologies

1. Technical assessment of the reported information

12. For Switzerland the Convention entered into force on 21 March 1994. Under the Convention, Switzerland committed to reducing its GHG emissions by 20 per cent below the 1990 level by 2020.[3] Switzerland's target under the Kyoto Protocol is to reduce emissions by 15.8 per cent below the 1990 level over the period 2013–2020. This target was derived on the basis of the 2020 target under the Convention. The ERT noted that the Party did not transparently describe the assumptions and conditions that are relevant to the attainment of its target. During the review, Switzerland submitted an amendment to its BR3, in which the Party clearly stated that it would assess the achievement of its target under the Convention by accounting against its QELRC under the second commitment period of the Kyoto Protocol.

13. The target under the Convention includes all GHGs included in the "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", namely CO_2, CH_4, N_2O, HFCs, PFCs, SF_6 and NF_3, as well as indirect CO_2 emissions. It also includes all IPCC sources and sectors included in the annual GHG inventory except the sector other. The GWP values used are from the AR4.

14. Base-year emissions are defined as 53,706.73 kt CO_2;[4] this amount will not be recalculated.

15. Emissions and removals from the LULUCF sector are not included in the emission estimates for the base year in order to be consistent with Switzerland's base year under the Kyoto Protocol; however, emissions and removals from the LULUCF sector are included in the target period (2013–2020). Switzerland reported in its BR3 that it plans to make use of market-based mechanisms to achieve its target (see para. 18 below).

16. In absolute terms this means that Switzerland's assigned amount under the second commitment period is 361,768.52 kt CO_2 eq for the period 2013–2020; this amount will not be recalculated.

17. Switzerland will account for LULUCF 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 Party will apply Kyoto Protocol accounting approaches, including gross-net accounting for afforestation, reforestation and deforestation and net-net accounting against a forest management reference level for forest management, including the application of the forest management cap at the end of the commitment period.

18. Switzerland will use international carbon credits generated from the flexible mechanisms under the Kyoto Protocol to compensate for some of its emissions over the period 2013–2020. The Party may also use Kyoto Protocol units carried over from the first commitment period.

2. Assessment of adherence to the reporting guidelines

19. The ERT assessed the information reported in the BR3 of Switzerland and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

[3] See document FCCC/SBSTA/2014/INF.6, paragraph 30.
[4] See document FCCC/IRR/2016/CHE, table 6.

C. Progress made towards the achievement of the quantified economy-wide emission reduction target

1. Mitigation actions and their effects

(a) Technical assessment of the reported information

20. 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.

21. 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.

22. Switzerland reported on its self-assessment of compliance with its emission reduction target and national rules for taking action against non-compliance. For example, Article 40 of the second CO_2 Act obliges the Federal Council to periodically evaluate the effectiveness of individual PaMs, and to consider the necessity of additional measures.

23. The key overarching cross-sectoral policy reported by Switzerland is the CO_2 Act (more formally the Federal Act on the Reduction of CO_2 Emissions), which provides the framework for climate policies. The first CO_2 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 CO_2 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 CO_2 eq in 2020, which is the most significant of the measures taken. Other policies that will deliver significant emission reductions are the CO_2 emission regulations for newly registered vehicles and a CO_2 levy on heating and process fuels, which are expected to reduce emissions in 2020 by 1,700 and 1,600 kt CO_2 eq, respectively.

24. The most significant cross-cutting policy is the CO_2 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 CO_2. 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 CO_2 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 CO_2 levy and negotiated reduction commitments is 1,600 and 400 kt CO_2 eq, respectively.

25. Switzerland has an emissions trading scheme based on the cap-and-trade system covering industries with substantial CO_2 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 CO_2 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 CO_2 eq.

26. Switzerland highlighted the mitigation actions that are under development, such as the third CO_2 Act, which is to come into force in 2021. The BR3 made reference to the NC7 in which the planned strengthening of a number of existing PaMs is outlined. Table 3 provides a summary of the reported information on the PaMs of Switzerland.

Table 3
Summary of information on policies and measures reported by Switzerland

Sector	*Key PaMs*	*Estimate of mitigation impact by 2020 (kt CO_2 eq)*
Policy framework and cross-sectoral measures	Second CO_2 Act	IE[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 CO_2 or CO_2 eq avoided in a given year as a result of the implementation of mitigation actions.

[a] Mitigation impacts of the second CO_2 Act are accounted for under PaMs that are part of this Act.

(b) Policies and measures in the energy sector

27. 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.

28. 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 the 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 29–32 below.

29. **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.

30. **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.

31. **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 CO_2 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 CO_2 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 CO_2 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 CO_2 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 CO_2 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 CO_2 Act in 2016 (in force since 2018) as part of the Energy Strategy 2050.

32. 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, CO_2 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.

33. **Residential and commercial sectors.** The CO_2 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 CO_2 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 CO_2 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 CO_2 eq in 2020.

34. **Transport sector.** The Swiss Parliament amended the CO_2 Act in 2011 (the second CO_2 Act) to include CO_2 emission targets for newly registered vehicles. In the first phase, during 2012–2015, a fleet average of 130 g CO_2/km was set. As a part of the first set of measures in the Energy Strategy 2050, these targets were enhanced to 95 g CO_2/km for new passenger cars and 147 g CO_2/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 CO_2 eq in 2020. Under the second CO_2 Act, fossil fuel importers must offset CO_2 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 CO_2 Act. This corresponds to a reduction of 6.5 Mt CO_2 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 CO_2 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 CO_2 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 CO_2 eq in 2020.

35. Despite the implementation of the PaMs described in paragraph 34 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 CO_2 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.

36. The NC7 included information, referenced in the BR3, 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 CO_2 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 Civil 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.

37. **Industrial sector.** Most GHG mitigation PaMs in the industrial sector are implemented under the CO_2 Act and control CO_2 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 CO_2 levy on heating and process fuels, the emissions trading scheme and the negotiated reduction commitments (for exemption from the CO_2 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

38. **Industrial processes.** The main industrial process PaMs have been addressing the reduction of F-gases and NMVOCs that are not covered under the CO_2 Act. Provisions relating to substances stable in the atmosphere (see table 3) 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 CO_2 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 CO_2 emissions is 580 kt CO_2 eq in total in 2020.

39. **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 CO_2 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.

40. 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 CO_2

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 CO_2 eq in 2020.

41. 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 nor did it provide a brief description of estimation methods in its BR3. During the review, Switzerland provided an amendment to the BR3, 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.

42. **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 m^3, and 1.5 million m^3 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 CO_2 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 BR2. 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.

43. 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 BR3. During the review, Switzerland provided an amendment to the BR3, 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 CO_2 budget. In the amendment, the Party further explained that the estimated mitigation impact (1.2 Mt CO_2 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. 42 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.

44. **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 CO_2 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 CO_2 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) Response measures

45. Switzerland reported on the assessment of the economic and social consequences of its response measures, including its support for projects that enhance efficiency in industrial production and its promotion of access to Swiss markets by granting preferential tariffs on products from developing countries and emerging markets.

(e) Assessment of adherence to the reporting guidelines

46. The ERT assessed the information reported in the BR3 of Switzerland and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

2. Estimates of emission reductions and removals and the use of units from market-based mechanisms and land use, land-use change and forestry

(a) Technical assessment of the reported information

47. On its use of units from LULUCF activities, Switzerland reported in CTF table 4 the contribution of LULUCF in 2014 and 2015 as +736.04 kt CO_2 eq and –720.15 kt CO_2 eq, respectively. Switzerland reported that it intends to use units from market-based mechanisms under the Kyoto Protocol. It reported in CTF tables 4 and 4(b) that it will account for contributions from market-based mechanisms (including carried-over units) at the end of the commitment period.

48. In response to a recommendation made in the previous review report, the Party reported, in CTF tables 4 and 4(b), 7,450.35 kt CO_2 eq of units from market-based mechanisms in the holding accounts in the national registry at the end of 2016 as a provisional estimate, and the contributions for the preceding years are reported as "IE". The values provided for 2016 comprise the number of units in the holding accounts at the end of 2016 and carried-over units from the first to the second commitment period of the Kyoto Protocol.

49. The ERT noted that, based on CTF table 4(a)II, using the activity-based approach, the cumulative net contribution from LULUCF activities from 2013 to 2015 is estimated as –654.59 kt CO_2 eq. The ERT also noted that Switzerland updated the Kyoto Protocol accounting values in its 2018 inventory submission. For 2016, Switzerland reported a contribution from LULUCF of –621.2 kt CO_2 eq or 1.3 per cent of total GHG emissions. The estimated cumulative net contribution of LULUCF from 2013 to 2016 is equivalent to –1,653.52 kt CO_2 eq. Based on this information, table 4 illustrates Switzerland's total GHG emissions, the contribution of LULUCF and the use of units from market-based mechanisms to achieve its target.

Table 4
Summary of information on the use of units from market-based mechanisms and land use, land-use change and forestry by Switzerland to achieve its target

Year	*Emissions excluding LULUCF (kt CO_2 eq)*	*Contribution of LULUCF (kt CO_2 eq*	*Emissions including contribution of LULUCF (kt CO_2 eq)*	*Use of units from market-based mechanisms (kt CO_2 eq)*[a]
Base year[b]	53 706.73	NA	NA	NA
2010	54 240.42	NA	NA	NA
2011	50 187.37	NA	NA	NA
2012	51 534.94	NA	NA	NA
2013	52 378.54	–620.31	51 758.23	0
2014	48 458.87	523.32	48 982.19	0
2015	47 908.91	–953.34	46 973.57	0

Year	*Emissions excluding LULUCF (kt CO_2 eq)*	*Contribution of LULUCF (kt CO_2 eq*	*Emissions including contribution of LULUCF (kt CO_2 eq)*	*Use of units from market-based mechanisms (kt CO_2 eq)*[a]
2016	48 293.42	–621.19	47 672.23	0

Sources: Switzerland's 2018 submission and CTF table 4.

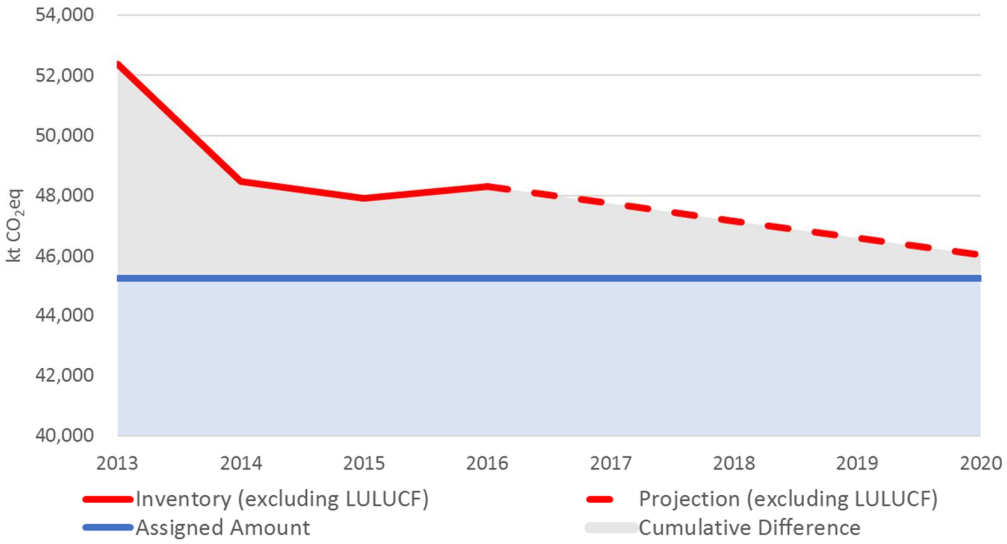
[a] Switzerland reported, in the BR3 and CTF table 4, 7,450,351 units, equivalent to 7,450.35 kt CO_2 eq, in its holding accounts in the national registry at the end of 2016. These units are not allocated to individual years and annual estimates are shown as 0 in the table.

[b] As contained in document FCCC/IRR/2016/CHE.

50. In assessing the progress towards the achievement of the 2020 target, the ERT noted that Switzerland's emission reduction target under the Convention of a 20 per cent emission reduction by 2020 compared with the 1990 level will be assessed using Switzerland's target under the second commitment period of the Kyoto Protocol of limiting emissions by 15.8 per cent below the 1990 level over the period 2013–2020 (see para. 12 above). As discussed above, in 2016, Switzerland's annual total GHG emissions excluding LULUCF were 10.1 per cent below the 1990 level, whereas, after taking into account the contribution from the LULUCF sector (using the activity-based approach), emissions were 11.2 per cent below the 1990 level (see para. 49 above).

51. Figure 1 presents the budget approach used to set the target and monitor progress. It illustrates the assigned amount with the current emission estimates, excluding LULUCF, and a linear trajectory to the latest projection of emissions in 2020. The difference between the current estimates and projections of net GHG emissions for 2013–2020 and the assigned amount is 22,810.36 kt CO_2 eq, which could be resolved through LULUCF units and the use of market-based mechanisms.

Figure 1
Greenhouse gas emissions compared with the assigned amount for the period 2013–2020



Note: The inventory and projections excluding LULUCF (384.6 Mt CO_2 eq) minus the assigned amount (361.8 Mt CO_2 eq) results in a difference of 22.8 Mt CO_2 eq.

52. The ERT noted that in 2016 the contribution of LULUCF (using the activity-based approach) was 621.19 kt CO_2 eq or 1.3 per cent of emissions. For the period 2013–2016, the contribution of LULUCF was 1,653.52 kt CO_2 eq. The use of market-based mechanisms was not estimated for individual years in the BR3; however, Switzerland held units equivalent to 7,450.35 kt CO_2 eq in its holding accounts at the end of 2016. Switzerland confirmed that final accounting for LULUCF and market-based mechanisms would take place at the end of the second commitment period of the Kyoto Protocol.

53. The ERT noted that the Party faces challenges in implementing mitigation actions in Switzerland that deliver the emission reductions needed to make sufficient progress towards its target. On the basis of the results of the projections under the WEM scenario (see para. 69 below), the ERT also noted that the Party may face challenges in the achievement of its target under the Convention and would need to further strengthen mitigation actions or source additional units from market-based mechanisms.

(b) Assessment of adherence to the reporting guidelines

54. The ERT assessed the information reported in the BR3 of Switzerland and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

3. Projections overview, methodology and results

(a) Technical assessment of the reported information

55. 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 BR3.

56. 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 CO_2 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 BR3 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.

57. 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 CO_2 Act and the CO_2 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.

58. 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 CO_2, CH_4, N_2O, PFCs, HFCs (treating PFCs and HFCs collectively in each case), SF_6 and NF_3. The projections are provided in an aggregated format for each sector as well as for a Party total using GWP values from the AR4. Projections in the BR3 are presented together with actual data for 1990–2015.

59. 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 CO_2 emissions.

60. 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

61. The methodology used for the preparation of the projections is different from that used for the preparation of the emission projections for the BR2 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 BR2. In order to enhance transparency, the Party provided an amendment to the BR3 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).

62. Projections in the BR3 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 BR2. Moreover, for transport, the future demand was reconsidered in the BR3 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 other sectoral categories the revised BR3 projections were mainly updates made in the light of the latest inventory data submitted in 2017 covering the period 1990–2015.

63. 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 BR2 on the basis of the most recent economic developments known at the time of the preparation of the projections.

64. Switzerland provided information in its NC7, which was referenced in the BR3, and in CTF table 5, on assumptions, methodologies, models and approaches used and on key variables and assumptions relevant for the preparation of all three reported projection scenarios. During the review, Switzerland provided an amendment to the BR3, in which it further specified how key underlying assumptions were estimated. Moreover, in its NC7, and referenced in the BR3, 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.

65. 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 BR3. 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 BR3, 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 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.

(c) Results of projections

66. 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 5 and figure 2. 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.

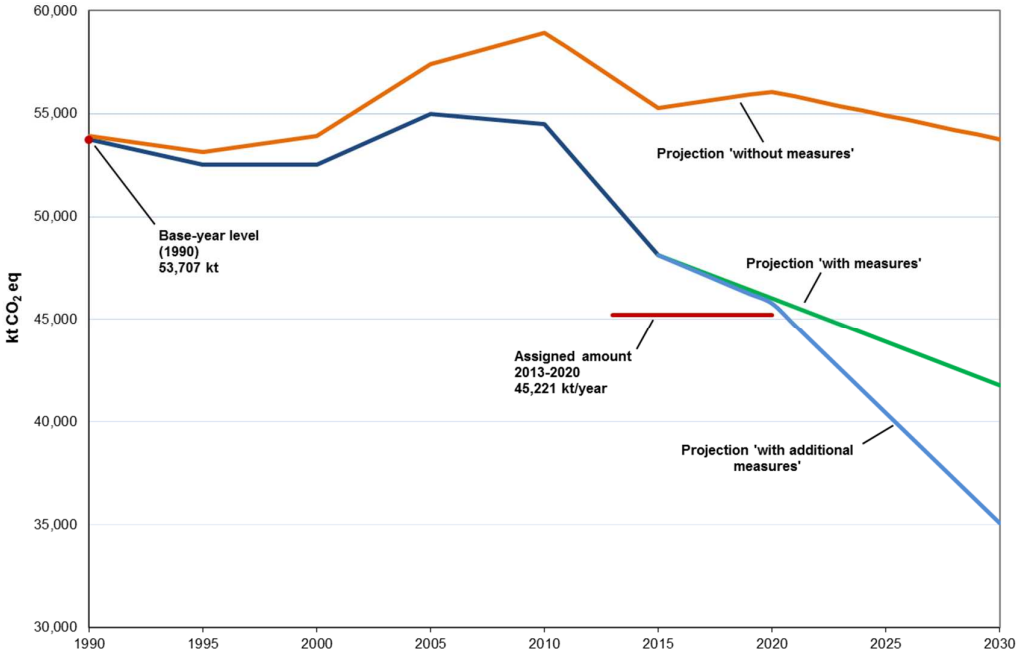
67. Total emissions without LULUCF are relevant for Switzerland's emission reduction targets. Indirect CO_2 emissions from the energy, IPPU, agriculture and waste sectors are included in Switzerland's emission reduction targets (there are currently no emissions from agriculture explicitly reported as indirect CO_2 emissions). As emissions from the sector other are not considered for Switzerland's emission reduction targets, the corresponding indirect CO_2 emissions from this sector are also excluded.

Table 5
Summary of greenhouse gas emission projections for Switzerland

	GHG emissions (kt CO_2 eq per year)	*Changes in relation to base-year[a] level (%)*	*Changes in relation to 1990 level (%)*
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
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.

Figure 2
Greenhouse gas emission projections reported by Switzerland



Source: Switzerland's NC7 and BR3 CTF table 6; total GHG emissions excluding LULUCF, including indirect CO_2 emissions.

68. Switzerland's total GHG emissions excluding LULUCF are projected to be 46,039.61 and 41,787.95 kt CO_2 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 CO_2 eq, respectively, are projected to be lower than those in 1990 by 14.8 and 34.8 per cent, respectively.

69. The 2020 projections suggest that Switzerland may face challenges in achieving its 2020 target under the Convention (see paras. 12 and 53 above).

70. Switzerland presented the WEM and WAM scenarios by sector for 2020 and 2030, as summarized in table 6.

Table 6
Summary of greenhouse gas emission projections for Switzerland presented by sector

	GHG emissions and removals (kt CO_2 eq)					*Change (%)*			
		2020		*2030*		*1990–2020*		*1990–2030*	
Sector	*1990*	*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

	GHG emissions and removals (kt CO_2 eq)					*Change (%)*			
		2020		*2030*		*1990–2020*		*1990–2030*	
Sector	*1990*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*
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 CO_2 emissions under the agriculture sector are included.

71. 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 CO_2 eq (24.2 per cent) and 825.67 kt CO_2 eq (12.2 per cent), respectively, between 1990 and 2020. Some reductions are also expected to occur in the waste sector and the indirect CO_2 emissions, amounting to 339.96 kt CO_2 eq (30.0 per cent) in the waste sector and 299.10 kt CO_2 eq (72.8 per cent), in the indirect CO_2 emissions respectively, between 1990 and 2020.

72. 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 CO_2 eq in 2030 compared with the projected emissions in 2020, or a decrease of 1,782.10 kt CO_2 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,[5] 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 – CO_2 emission regulations for newly registered vehicles and the partial compensation of CO_2 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.

73. 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 CO_2 eq in 2030 compared with the projected emission level in 2020, or 683.69 kt CO_2 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 CO_2 eq is projected in 2030 compared with the 2020 level.

74. 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,

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

because the additional measures in Switzerland's WAM scenario mostly comprise the strengthening of existing PaMs.

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

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

	GHG emissions and removals (kt CO_2 eq)					*Change (%)*			
		2020	*2030*	*1990–2020*	*1990–2030*				
Gas	*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_2O	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.

76. For 2020 the most significant reductions compared with the 1990 level are projected for CO_2 emissions – 7,153.74 kt CO_2 eq (16.2 per cent) – and for CH_4 – 1,162.05 kt CO_2 eq (19.0 per cent). For 2030 the most significant reductions are projected for CO_2 emissions, with an additional reduction of 3,466.61 kt CO_2 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 CO_2 eq compared with the 2020 level, that is, emissions almost halve between 2020 and 2030.

77. 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 CO_2 emissions of 7,272.73 kt CO_2 eq (16.5 per cent) in the period 1990–2020 and 16,724.25 kt CO_2 eq (37.9 per cent) in the period 1990–2030.

78. 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

79. The ERT assessed the information reported in the BR3 of Switzerland and identified an issue relating to transparency and adherence to the UNFCCC reporting guidelines on BRs. The finding is described in table 8.

Table 8
Findings on greenhouse gas emission projections reported in the third biennial report 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	Through its reference to the NC7, Switzerland reported limited information on the results of its sensitivity analyses in its BR3, 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 this 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 BR 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 and on BRs.

D. Provision of financial, technological and capacity-building support to developing country Parties

1. Approach and methodologies used to track support provided to non-Annex I Parties

(a) Technical assessment of the reported information

80. In the BR3 Switzerland reported information on the provision of financial, technological and capacity-building support required under the Convention.

81. Switzerland provided details on what "new and additional" support it has provided although it did not provide a definition of "new and additional" as such. For Switzerland, public climate finance has seen a steady increase over recent years. This increase was partly fuelled by the decision of the Swiss Parliament in 2011 to raise the level of official development assistance to 0.5 per cent of gross national income by 2015. In addition, Switzerland's development assistance has gradually shifted to an enhanced focus on climate change, thus supporting more climate-relevant and 'climate proofing' programmes and projects in developing countries. These strategic decisions have led to a remarkable progression compared with previous efforts. Switzerland therefore considers the climate finance it has provided to be new and additional.

82. Switzerland reported the financial support that it has provided to non-Annex I Parties, distinguishing between support for mitigation and adaptation activities and recognizing the capacity-building elements of such support. It explained how it tracks finance for adaptation and mitigation using the Rio markers.

83. The BR3 includes information on the national approach to tracking the provision of support, indicators, delivery mechanisms used and allocation channels tracked. Switzerland included information on how it has refined its approach to tracking climate support and methodologies.

84. Switzerland described the methodology and underlying assumptions used for collecting and reporting information on financial support, including underlying assumptions, guidelines, eligibility criteria and/or indicators. The methodology used for preparing

information on international climate support is based on a technical report on accounting for mobilized private climate finance prepared by a technical working group in 2015.

85. Switzerland provided details of measures taken to give effect to its commitments in accordance with Article 4, paragraphs 3, 4 and 5, of the Convention. Of these, Switzerland considers that its contributions to multi-annual multilateral funds, such as the Green Climate Fund and the Global Environment Facility, indicate its commitment to providing predictable climate finance. Switzerland's bilateral support for climate action is based on a cooperative, bilateral dialogue with recipient countries. Every four years the Swiss cooperation offices engage in a demand-driven planning dialogue, where, contingent on the available resources, the needs and priorities of the recipient country are assessed. This programmatic procedure ensures country ownership and provides increased predictability for the partner countries. The ERT noted that Switzerland addressed the predictability of the finance provided but not the adequacy of the provision of climate finance support for developing countries.

(b) Assessment of adherence to the reporting guidelines

86. The ERT assessed the information reported in the BR3 of Switzerland and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

2. Financial resources

(a) Technical assessment of the reported information

87. 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.

88. Switzerland indicated what "new and additional" financial resources it has provided. Although Switzerland clarified how it has determined such resources as being "additional", from the explanations provided it was not clear why these resources were considered "new" (see para. 81 above).

89. 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. 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 has decreased slightly while the overall financial support for climate action in developing countries was significantly increased since BR2 (see also para. 93 below).

90. 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. Table 9 includes the information reported by Switzerland on its provision of financial support.

Table 9
Summary of information on provision of financial support by Switzerland in 2015–2016
(Millions of United States dollars)

	Year of disbursement	
Allocation channel of public financial support	*2015*	*2016*
Official development assistance	2 726.5	2 772.5
Climate-specific contributions through multilateral channels, including:	55.0	59.4
Global Environment Facility	22.0	21.9
Least Developed Countries Fund	1.0	1.8
Special Climate Change Fund	1.3	0.5
Adaptation Fund	0	0
Green Climate Fund	30.0	34.2
Trust Fund for Supplementary Activities	0.3	0.3
Financial institutions, including regional development banks	67.3	64.2
United Nations bodies	8.9	12.6
Other	0.3	0.8
Climate-specific contributions through bilateral, regional and other channels	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.

91. Switzerland reported on its climate-specific public financial support, totalling USD 304.4 million in 2015 and USD 338.6 million in 2016. The annual average of total financial support provided by Switzerland through multilateral, bilateral, regional and other channels as reported in the BR3 increased by 10.8 per cent compared with the annual average as reported in the BR2.

92. Switzerland's development cooperation has steadily increased over recent years. During the reporting period, Switzerland placed a focus on climate change, enhancing its support for climate-relevant and 'climate proofing' programmes and projects in developing countries in various regions, including Africa, the Caribbean, Central and South Asia, and South America, for which it disbursed USD 330.1 million. This amount was disbursed in the form of grants through bilateral, multi-bilateral and multilateral channels in 2016 (up from USD 281 million in 2013) as public climate finance and mobilized multi-bilaterally a total of USD 8.5 million in private finance in 2016. Of the bilateral climate finance disbursed in 2016, USD 102 million or 50.5 per cent went to adaptation and USD 100 million or 49.5 per cent to mitigation (compared with USD 112 million or 61 per cent for adaptation and USD 72 million or 39 per cent for mitigation in 2013).

93. 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 overall increase in financial support, 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. The ERT noted that Switzerland reported in CTF table 7(b) its

bilateral support allocated to Parties included in Annex I to the Convention in 2015 and 2016. Information on financial support from the public sector provided through multilateral and bilateral channels and the allocation of that support by priority is presented in table 10.

Table 10
Summary of information on channels of financial support used in 2015–2016 by Switzerland
(Millions of United States dollars)

Allocation channel of public financial support	*Year of disbursement*				*Share (%)*	
	2015	*2016*	*Difference*	*Change (%)*	*2015*	*2016*
Support through bilateral and multilateral channels allocated for:						
Mitigation	76.2	100.2	24.0	31.5	25.0	29.6
Adaptation	98.0	103.9	5.8	5.9	32.2	30.7
Cross-cutting	130.1	134.5	4.4	3.4	42.7	39.7
Other	0.0	0.0	–	–	–	–
Total	**304.4**	**338.6**	**34.2**	**11.3**	**100.0**	**100.0**
Detailed information by type of channel						
Multilateral channels						
Mitigation	0.0	0.0	0.7	71.0	–	–
Adaptation	1.0	1.8	4.4	3.4	0.8	1.3
Cross-cutting	130.1	134.5	–	–	99.2	98.7
Other	0.0	0.0	0.7	71.0	–	–
Total	**131.2**	**136.3**	**5.2**	**3.9**	**100.0**	**100.0**
Bilateral channels						
Mitigation	76.2	100.2	24.0	31.5	44.0	49.5
Adaptation	97.0	102.1	5.1	5.2	56.0	50.5
Cross-cutting	0.0	0.0	–	–	–	–
Other	0.0	0.0	–	–	–	–
Total	**173.2**	**202. 3**	**29.1**	**16.8**	**100.0**	**100.0**
Multilateral compared with bilateral channels						
Multilateral	131.2	136.3	5.2	3.9	43.1	40.3
Bilateral	173.2	202.3	29.1	16.8	56.9	59.7
Total	**304.4**	**338.7**	**34.2**	**11.3**	**100.0**	**100.0**

Source: CTF tables 7, 7(a) and 7(b) of the BR3 of Switzerland.

94. The BR3 includes detailed information on the financial support provided though multilateral, bilateral and regional channels in 2015 and 2016. More specifically, Switzerland contributed through multilateral channels, as reported in the BR3 and in CTF table 7(a), USD 131.2 and 136.3 million for 2015 and 2016, respectively. The contributions were made to

specialized multilateral climate change funds, such as the Green Climate Fund, the Global Environment Facility, the Least Developed Countries Fund, the Special Climate Change Fund, the UNFCCC trust funds, the IPCC and the Capacity-building Initiative for Transparency Trust Fund.

95. The BR3 and CTF table 7(b) also include detailed information on the total financial support provided though bilateral, multi-bilateral and regional channels, including the mobilized private climate finance of USD 173.2 and 202.3 million in 2015 and 2016, respectively.

96. The BR3 provides information on the types of support provided. In terms of the focus of public financial support, as reported in CTF table 7 for 2015, the shares of the total public financial support allocated for mitigation, adaptation and cross-cutting projects were 25.0, 32.2 and 42.7 per cent, respectively. In addition, 43.1 per cent of the total public financial support was allocated through multilateral channels and 56.9 per cent through bilateral, regional and other channels. In 2016, the shares of total public financial support allocated for mitigation, adaptation and cross-cutting projects were 29.6, 30.7 and 39.7 per cent, respectively. Furthermore, 40.3 per cent of the total public financial support was allocated through multilateral channels and 59.7 per cent through bilateral, regional and other channels.

97. Switzerland indicated in CTF tables 7(a) and 7(b) that the majority of financial contributions made through bilateral, regional and multilateral channels in 2015 and 2016 was allocated to cross-cutting sectors. In response to the recommendation made in the report on the technical review of the BR2 to provide information on specific sectors, the Party explained that it is not possible to give a clear indication of sectoral support in the BR CTF tables because these require aggregated data on individual projects at the country level. During the review, Switzerland further explained that it was not able to present sector-specific tables because this would mean an additional administrative burden and a high risk of errors when entering data manually. Given the relevance of increased transparency and in order to illustrate the diversity of projects, programmes and regions of Swiss support for climate action in developing countries, the Party provided a full list of all Swiss projects and programmes to support climate action in developing country Parties on an activity-level basis from 2013 to 2016 in a supplementary document submitted with the BR3.[6]

98. Switzerland indicated in CTF tables 7(a) and 7(b) that most of the funds provided through multilateral channels in 2015 and 2016, except for those allocated to the Least Developed Countries Fund to provide support for adaptation, were assigned to cross-cutting action across mitigation and adaptation. The ERT noted that the Party's financial support through bilateral, regional and other channels, in 2015 and 2016, covers mitigation and adaptation projects.

99. CTF tables 7(a) and 7(b) include information on the types of financial instrument used for providing assistance to developing countries. The information indicates that almost all contributions through bilateral, regional or multi-bilateral public contributions are in the form of grants (e.g. for the African Development Fund). Switzerland explained in CTF table 7 that a grant indicates a transfer made in cash, goods or services for which no repayment is required. The Party also indicated that flows reported under mobilized private climate finance were in the form of equity (e.g. for the International Finance Corporation), which refers to the value of the interest of an owner or partial owner of an asset. However, the ERT noted that although Switzerland provides its contributions to multilateral climate funds in the form of grants, this does not necessarily mean that the recipient countries will receive this support in the form of grants as the financial instruments used by institutions vary.

100. During the review, Switzerland confirmed that although its contributions to multilateral institutions are provided in the form of grants and equity, these institutions, depending on the project or programme, use the support provided by Switzerland in the most effective way of addressing the needs of the multilateral institutions' recipient countries. This decision is made in dialogue with the recipient country, partners, the implementing agency, etc. Depending on the project design, the support would be a loan, a risk guarantee, a high-

[6] Available at https://unfccc.int/sites/default/files/resource/624078315_switzerland-nc7-br3-1-che_projects_and_programmes_in_developing_.pdf.

risk equity tranche and/or another instrument that is most fit for purpose and will lead to the greatest climate and sustainable development impact on the ground.

101. Switzerland is making efforts to mobilize private finance through multilateral institutions. For example, through its contribution to the Climate Investment Funds, Switzerland supported the Scaling Up Renewable Energy in Low Income Countries Programme by mobilizing USD 3 million in private finance during the period 2015–2016. Switzerland supports the Transformative Carbon Asset Facility, which is designed to support an implementing country's government in enhancing sectoral planning, strengthening low-carbon policy coordination and implementation, and monitoring sector performance in terms of GHG emissions. The Facility is expected to create a conducive environment for increasing private sector investment in low-carbon technologies.

102. In the BR3, Switzerland clarified that private finance is mainly mobilized for emerging markets. For example, in 2016 the Party mobilized roughly USD 7 million from the private sector through the Swiss Investment Fund for Emerging Markets, up from USD 3.7 million in the reporting period 2013–2014. The Party reported on how it uses public funds to promote private sector financial support for developing countries, which it sees as pivotal to effectively increasing mitigation and adaptation efforts in those countries.

103. CTF table 7(b) includes quantitative information on private financial flows through bilateral climate finance for mitigation and adaptation. Switzerland explained that it mobilized private finance through multilateral channels, but it did not report such private finance or the outflow data of the public climate finance provided and mobilized by multilateral institutions. Switzerland explained in the BR3 that these data were omitted because bilateral reporting of mobilized private finance through multilateral channels is not possible owing to the lack of access to data. The data are managed and stored by the multilateral entities and Switzerland could not assess the attributable share of private financing flow. Further, the Party explained that bilateral reporting of this information would not do justice to the complexity and the joint effort of all partners involved in multilateral institutions. Switzerland remains committed to increasing its share of mobilized private finance as part of its climate finance spending.

104. Switzerland explained in its BR3 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 BR3 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.

105. Switzerland did not report specific sectors in CTF tables 7(a) and 7(b). To illustrate the diversity of projects, programmes and regions of Swiss support for climate action in developing countries, the Party submitted a supplementary document with its BR3 containing a full list of all climate-relevant projects (see para. 97 above). The list also indicates in detail all the sectors that have benefited from each of the activities, since it was not possible to give a clear indication of sectoral activities in the BR CTF tables owing to aggregation.

106. In response to the recommendation made in previous technical review reports, the Party provided information on the approaches used to ensure that the resources provided effectively address the needs of non-Annex I Parties regarding climate change adaptation and mitigation. For example, Switzerland reported in the NC7, and referenced in the BR3, that its projects and programmes are built on the needs and priorities formulated by its partner countries and address the measures highlighted in its partner countries' nationally determined contributions, national adaptation plans and other national climate policies and strategies. The ERT considers that reporting more specific information, including on tools such as the

indicators for climate benefits to its partners that Switzerland might use in designing projects and programmes, would further improve the transparency of the reporting.

107. The ERT noted that Switzerland also reported in CTF table 7(b) its bilateral support allocated to Ukraine (a Party included in Annex I to the Convention) in 2015 and 2016.

(b) Assessment of adherence to the reporting guidelines

108. The ERT assessed the information reported in the BR3 of Switzerland and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

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

(a) Technical assessment of the reported information

109. 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

110. 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 Enterprise[7] 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.

111. Switzerland reported in its NC7, and referenced in the BR3, 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 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.

112. The ERT noted that Switzerland did not provide information in CTF table 8. Switzerland reported on in the NC7, and referenced in the BR3, 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.

113. 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

114. The ERT assessed the information reported in the BR3 of Switzerland and identified an issue relating to completeness and adherence to the UNFCCC reporting guidelines on BRs. The finding is described in table 11.

[7] See https://www.s-ge.com/en/sbh.

Table 11
Findings on technology development and transfer from the review of the third biennial report of Switzerland

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in CTF table 8	The ERT noted that Switzerland did not provide information in CTF table 8 on the provision of technology development and transfer support, although it referred to the relevant information provided in the NC7.
	Issue type: completeness	In the NC7, and referenced in the BR3, Switzerland explained that owing to the integrated character of the bilateral technology development and transfer support provided by the Party, it is not possible to single out and quantify the respective components of technology transfer. During the review, Switzerland confirmed its difficulty in providing specific information and that it did not complete CTF table 8 because the individual projects, programmes and activities it supports involve various technologies and include technology-transfer and capacity-building components.
	Assessment: recommendation	The ERT reiterates the recommendations made in the reports on the technical reviews of the BR1 and BR2 that Switzerland provide information on the provision of technology development and transfer support, to the extent possible, in CTF table 8 in its next BR. The ERT considers that the provision in CTF table 8 of at least qualitative information on activities and measures for technology transfer support could improve the completeness of the reporting by the Party.

Note: Item listed under reporting requirement refers to the CTF table number from the annex to decision 19/CP.18. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on BRs.

4. Capacity-building

(a) Technical assessment of the reported information

115. In the BR3, Switzerland supplied information on how it has provided capacity-building support for mitigation, adaptation and technology that responds to the existing and emerging needs identified by non-Annex I Parties. Switzerland described individual measures and activities related to capacity-building support in textual format.

116. Switzerland reported that it has supported climate-related capacity development activities relating to adaptation, mitigation, climate financing and other areas. Switzerland also reported that it has responded to the existing and emerging capacity-building needs of non-Annex I Parties by following the principles of national ownership, stakeholder participation and country-driven demand. Capacity-building is an essential component of most Swiss programmes and projects that support developing countries in their endeavours to mitigate and adapt to climate change. Capacity-building is critical for the successful and effective implementation of climate measures and helps to ensure the sustainability of any project or programme. For example, the Environmental and Social Risk Management programme of the International Finance Corporation aims to internalize environmental and social effects into decision-making by local businesses and provides training for policy and financial regulators in Africa and Asia.

117. The ERT noted that Switzerland did not provide information in CTF table 9. Switzerland reported that owing to the highly integrated character of all its development cooperation projects and programmes, it is not possible for it to single out the capacity-building components.

(b) Assessment of adherence to the reporting guidelines

118. The ERT assessed the information reported in the BR3 of Switzerland and identified an issue relating to transparency and adherence to the UNFCCC reporting guidelines on BRs. The finding is described in table 12.

Table 12
Findings on capacity-building from the review of the third biennial report of Switzerland

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in CTF table 9	The ERT noted that Switzerland did not provide information in CTF table 9 on its provision of capacity-building support but referenced the BR3 for the relevant information. In the BR3, the information provided in the NC7 is referenced.
	Issue type: transparency Assessment: recommendation	The ERT reiterates the recommendations made in the reports on the technical reviews of the BR1 and BR2 that Switzerland, in its next BR, fill in, to the extent possible, CTF table 9. The ERT considers that the provision in CTF table 9 of at least qualitative information available on projects and programmes on capacity-building support could improve the transparency of the reporting by the Party.

Note: Item listed under reporting requirement refers to the CTF table number from the annex to decision 19/CP.18. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on BRs.

III. Conclusions and recommendations

119. The ERT conducted a technical review of the information reported in the BR3 and CTF tables of Switzerland in accordance with the UNFCCC reporting guidelines on BRs. The ERT concludes that the reported information mostly adheres to the UNFCCC reporting guidelines on BRs and provides an overview of emissions and removals related to the Party's quantified economy-wide emission reduction target; assumptions, conditions and methodologies related to the attainment of the target; progress made by Switzerland in achieving its target; and the Party's provision of support to developing country Parties.

120. 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 its 1990 level, whereas total GHG emissions including LULUCF were 11.2 per cent below its 1990 level in 2016. 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.

121. Under the Convention, Switzerland committed itself to achieving a quantified economy-wide emission reduction target of 20.0 per cent below the 1990 level by 2020. Switzerland will assess achievement of its target under the Convention using its target under the second commitment period of the Kyoto Protocol, which requires Switzerland to limit emissions by 15.8 per cent below the 1990 level in the period 2013–2020. The target covers CO_2, CH_4, N_2O, HFCs, PFCs, SF_6 and NF_3. The target also includes indirect CO_2 emissions. Emissions are expressed using GWP values from the AR4. The target covers all sources and sectors included in the annual GHG inventory except the sector other. Emissions and removals from the LULUCF sector are not included in the base year but are included in the period 2013–2020. Switzerland reported that it plans to make use of market-based mechanisms to achieve its target. In absolute terms, this means that under the Convention Switzerland has to limit emissions to 361,768.52 kt CO_2 eq over the period 2013–2020.

122. Switzerland's main policy framework relating to energy and climate change and the key legislation supporting Switzerland's climate change goals is the second CO_2 Act. The mitigation actions with the most significant mitigation impact are the cantonal building codes, CO_2 emission regulations for newly registered vehicles and the CO_2 levy on heating and process fuels.

123. For 2016 Switzerland reported in the BR3 total GHG emissions excluding LULUCF applicable to the target of 48,293.42 kt CO_2 eq, or 10.1 per cent below the 1990 base-year

level. Switzerland reported on its use of units from the market-based mechanisms and on the contribution of LULUCF towards achieving its target. Switzerland's contribution from LULUCF is estimated to be 621.19 kt CO_2 eq in 2016. Switzerland reported that at the end of 2016 it had units from market-based mechanisms equivalent to 7,450.35 kt CO_2 eq in its national registry holding accounts.

124. The GHG emission projections provided by Switzerland in the BR3 correspond to the WOM, WEM and WAM scenarios. Under these 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.

125. The ERT noted that Switzerland faces challenges in making progress towards its emission reduction target. Total emissions excluding LULUCF for the period 2013–2020 are projected to be 384,578.89 kt CO_2 eq, and Switzerland's assigned amount is 361,768.52 kt CO_2 eq. After applying the contribution from LULUCF for the period 2013–2016 and units from market-based mechanisms in Switzerland's national registry holding accounts, a difference of 13,706.48 kt CO_2 eq remains.

126. On the basis of the results of the projections for 2020 under the WEM and WAM scenarios, the ERT noted that Switzerland may face challenges in achieving its target even if all additional PaMs under the WAM scenario are implemented. In this regard, Switzerland will need to further strengthen mitigation actions or source additional units from market-based mechanisms in order to achieve its emission reduction target.

127. 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 and United Nations agencies. Switzerland attaches great importance to increasing the coherence and effectiveness in 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.

128. Switzerland has increased its contributions steadily over recent years. The annual average support provided by Switzerland as reported in the BR3 increased by 10.8 per cent compared with the annual average as reported in the BR2. The Party's public financial support in 2015 and 2016 totalled USD 173.2 and 202.3 million per year, respectively. For those years, Switzerland provided more support for mitigation than for adaptation. The biggest share of financial support went to cross-cutting projects, followed by the sector other.

129. 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.

130. In the course of the review, the ERT formulated the following recommendations for Switzerland to improve its adherence to the UNFCCC reporting guidelines on BRs in its next BR:

(a) To improve the completeness of its reporting by providing information, to the extent possible, in CTF table 8 on the provision of technology development and transfer support (see issue 1 in table 11);

(b) To improve the transparency of its reporting by filling in, to the extent possible, CTF table 9 (see issue 1 in table 12).

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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B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Schilt Adrian (Federal Office for the Environment), including additional material. The following documents[1] were provided by Switzerland:

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