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

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 Sweden, 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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Abbreviations and acronyms

AEA	annual emission allocation
AR4	Fourth Assessment Report of the Intergovernmental Panel on Climate Change
BR	biennial report
CH ₄	methane
CO ₂	carbon dioxide
CO ₂ eq	carbon dioxide equivalent
CTF	common tabular format
ERT	expert review team
ESD	effort-sharing decision
EU	European Union
EU ETS	European Union Emissions Trading System
GDP	gross domestic product
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
IATI	International Aid Transparency
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
NO	not occurring
non-Annex I Party	Party not included in Annex I to the Convention
non-ETS sectors	sectors not covered by the European Union Emissions Trading System
N ₂ O	nitrous oxide
ODA	official development assistance
OECD	Organisation for Economic Co-operation and Development
OECD DAC	OECD Development Assistance Committee
PaMs	policies and measures
PFC	perfluorocarbon
SEK	Swedish krona
SEPA	Swedish Environmental Protection Agency
SF ₆	sulfur hexafluoride
SIDA	Swedish International Development Cooperation Agency
UNFCCC	United Nations Framework Convention on Climate Change
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 BR3¹ of Sweden. 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 Sweden, which provided comments that were considered and incorporated, with revisions, into this final version of the report.

3. The review was conducted from 17 to 22 September 2018 in Stockholm by the following team of nominated experts from the UNFCCC roster of experts: Mr. Fernando Farias (Chile), Mr. Zeljko Juric (Croatia), Ms. Irini Nikolaou (Greece), Mr. Stephen Treacy (Ireland) and Mr. Vute Wangwacharakul (Thailand). Mr. Farias and Mr. Juric were the lead reviewers. The review was coordinated by Ms. Kirsten Macey and Mr. Davor Vesligaj (UNFCCC secretariat).

B. Summary

4. The ERT conducted a technical review of the information reported in the BR3 of Sweden in accordance with the UNFCCC reporting guidelines on BRs (annex I to decision 2/CP.17).

1. Timeliness

5. The BR3 was submitted on 22 December 2017, before the deadline of 1 January 2018 mandated by decision 2/CP.17. The CTF tables were submitted on 22 December 2017 and resubmitted on 19 January 2018.

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 Sweden in its BR3 mostly adheres to the UNFCCC reporting guidelines on BRs.

Table 1

Summary of completeness and transparency of mandatory information reported by Sweden in its third biennial report

<i>Section of BR</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of recommendations</i>
GHG emissions and trends	Complete	Transparent	NA
Assumptions, conditions and methodologies related to the attainment of the quantified economy-wide emission reduction target	Complete	Mostly transparent	Issue 1 in table 3
Progress in achievement of targets, including projections	Complete	Mostly transparent	Issues 1 and 2 in table 5

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

<i>Section of BR</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of recommendations</i>
Provision of support to developing country Parties	Mostly complete	Mostly transparent	Issues 1 and 3 in table 14

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 emissions and removals related to the quantified economy-wide emission reduction target

1. Technical assessment of the reported information

7. Total GHG emissions² excluding emissions and removals from LULUCF decreased by 26 per cent (18,622.23 kt CO₂ eq) between 1990 and 2016, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 72.1 per cent (25,665.99 kt CO₂ eq) over the same period. Table 2 illustrates the emission trends by sector and by gas for Sweden.

Table 2

Greenhouse gas emissions by sector and by gas for Sweden for the period 1990–2016

	<i>GHG emissions (kt CO₂ eq)</i>					<i>Change (%)</i>		<i>Share (%)</i>	
	<i>1990</i>	<i>2000</i>	<i>2010</i>	<i>2015</i>	<i>2016</i>	<i>1990–2016</i>	<i>2015–2016</i>	<i>1990</i>	<i>2016</i>
	Sector								
1. Energy	53 022.53	50 005.63	48 126.47	38 979.88	37 790.01	–28.7	–3.1	74.1	71.4
A1. Energy industries	9 951.09	8 948.45	13 129.05	9 011.92	9 200.12	–7.5	2.1	13.9	17.4
A2. Manufacturing industries and construction	11 343.96	11 891.28	9 270.11	7 643.57	7 581.50	–33.2	–0.8	15.9	14.3
A3. Transport	19 106.92	19 766.33	20 339.74	17 850.87	16 890.93	–11.6	–5.4	26.7	31.9
A4. and A5. Other	12 231.12	8 931.67	4 440.32	3 538.92	3 377.64	–72.4	–4.6	17.1	6.4
B. Fugitive emissions from fuels	389.44	467.90	947.25	934.60	739.81	90.0	–20.8	0.5	1.4
C. CO ₂ transport and storage	0.00	0.00	0.00	0.00	0.00	NA	NA	NA	NA
2. IPPU	7 119.69	7 656.31	7 547.70	6 508.51	6 895.20	–3.2	5.9	10.0	13.0
3. Agriculture	7 630.42	7 764.60	6 813.30	6 864.11	6 879.16	–9.8	0.2	10.7	13.0
4. LULUCF	–35 925.55	–37 983.34	–44 641.12	–44 865.08	–42 969.31	19.6	–4.2	NA	NA
5. Waste	3 742.30	3 222.44	1 924.23	1 402.34	1 328.34	–64.5	–5.3	5.2	2.5
6. Other	0.00	0.00	0.00	0.00	0.00	NA	NA	NA	NA
Gas ^a									
CO ₂	57 506.34	54 724.98	52 927.27	43 385.56	42 568.02	–26.0	–1.9	80.4	80.5
CH ₄	7 601.84	7 017.55	5 440.75	4 818.24	4 745.82	–37.6	–1.5	10.6	9.0
N ₂ O	5 730.38	5 690.65	4 802.61	4 566.18	4 605.87	–19.6	0.9	8.0	8.7
HFCs	5.87	721.08	989.81	896.59	882.74	14 926.9	–1.5	0.0	1.7

² In this report, the term “total GHG emissions” refers to the aggregated national GHG emissions expressed in terms of CO₂ eq excluding LULUCF, unless otherwise specified. Values in this paragraph are calculated based on the 2018 annual submission, version 3.

	GHG emissions (kt CO ₂ eq)					Change (%)		Share (%)	
	1990	2000	2010	2015	2016	1990– 2016	2015– 2016	1990	2016
	PFCs	568.78	375.93	187.79	35.13	31.18	-94.5	-11.3	0.8
SF ₆	101.73	118.78	63.46	53.14	59.09	-41.9	11.2	0.1	0.1
NF ₃	NO	NO	NO	NO	NO	–	–	–	–
Total GHG emissions without LULUCF	71 514.95	68 648.97	64 411.70	53 754.84	52 892.72	-26.0	-1.6	100.0	100.0
Total GHG emissions with LULUCF	35 589.40	30 665.63	19 770.58	8 889.76	9 923.41	-72.1	11.6	NA	NA

Source: GHG emission data: Sweden's 2018 annual submission, version 3.

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

8. The decrease in total emissions was driven mainly by a transition from fossil-fuel use (mainly oil-fuelled heating) for the heating of residential, commercial and institutional premises to heat pumps and district heating. Other significant drivers have been a switch from fossil-fuel use to biofuels and electricity in the manufacturing combustion sector and reduced landfill gas emissions from the waste sector. Long-term ambitious policies, such as energy and carbon taxes that have existed since the early 1990s, have also driven emission reductions. The Swedish Forestry Act also drives a strong LULUCF sector because it has two overarching, equal objectives: to support forest production through effectively and responsibly producing sustainable yields; and to protect the environment.

9. The summary information provided on GHG emissions was consistent with the information reported in the 2017 annual submission.

10. To reflect the most recently available data, Sweden's 2018 annual inventory submission (version 3) has been used as the basis for discussion in chapter II.A of this review report. The ERT noted that the 2018 inventory information had not undergone a technical review at the time of the review week and is different from the 2017 inventory submission used by Sweden for the BR3. The ERT also noted that there are no substantive differences between trends presented in the 2018 GHG inventory and those reported in the BR3. Total GHG emissions excluding LULUCF, as reported in the BR3, decreased by 25.2 per cent between 1990 and 2015, while according to the 2018 annual inventory submission they decreased by 26 per cent between 1990 and 2016.

11. In brief, Sweden's national inventory arrangements were established in accordance with the EU Monitoring Mechanism Regulation (EU Regulation No. 525/2013). At the national level, the legal basis is provided by the Ordinance on Climate Reporting (2014:1434), as was also the case for the BR2. There have been no changes to these arrangements since the BR2.

2. Assessment of adherence to the reporting guidelines

12. The ERT assessed the information reported in the BR3 of Sweden 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. Assumptions, conditions and methodologies related to the attainment of the target

1. Technical assessment of the reported information

13. For Sweden, the Convention entered into force on 21 March 1994. Under the Convention Sweden committed to contributing to the achievement of the joint EU economy-wide emission reduction target of 20 per cent below the 1990 level by 2020. The EU offered to move to a 30 per cent reduction target on the condition that other developed countries

commit to a comparable target and developing countries contribute according to their responsibilities and respective capabilities under a new global climate change agreement.

14. The target for the EU and its member States is formalized in the EU 2020 climate and energy package. The legislative package regulates emissions of CO₂, CH₄, N₂O, HFCs, PFCs and SF₆ using GWP values from the AR4 to aggregate the GHG emissions of the EU until 2020. Emissions and removals from the LULUCF sector are not included in the quantified economy-wide emission reduction target under the Convention. The EU generally allows its member States to use units from the Kyoto Protocol mechanisms as well as new market mechanisms for compliance purposes, subject to a number of restrictions in terms of origin and type of project and up to an established limit. Companies can make use of such units to fulfil their requirements under the EU ETS.

15. The EU 2020 climate and energy package includes the EU ETS and the ESD (see chapter II.C.1(a) below). The EU ETS covers mainly point emissions sources in the energy, industry and aviation sectors. An EU-wide emissions cap has been put in place for the period 2013–2020 with the goal of reducing emissions by 21 per cent below the 2005 level by 2020. Emissions from non-ETS sectors are regulated through member State specific targets that add up to a reduction at the EU level of 10 per cent below the 2005 level by 2020.

16. Under the ESD, Sweden has a target of reducing its total emissions to 17 per cent below the 2005 level by 2020 for non-ETS sectors. National emission targets for non-ETS sectors for 2020 have been translated into binding quantified AEAs for the period 2013–2020. The AEAs for each member State and year were adopted by the European Commission in March 2013. In October 2014, the AEAs were adjusted to ensure consistency with the enlarged EU ETS scope for the period 2013–2020. In 2017, an EU decision was taken to update the AEAs for the period 2017–2020 to be consistent with international reporting guidance. As a result, Sweden has a more stringent target under the ESD. The revised AEAs follow a linear pathway from 41,685.10 kt CO₂ eq in 2013 to 36,080.17 kt CO₂ eq in 2020.³

17. During the review Sweden informed the ERT that as part of the Swedish Programme for International Climate Initiatives it undertakes clean development mechanism and joint implementation projects in developing countries. In 2017 Sweden cancelled the use of international credits generated during the first commitment period of the Kyoto Protocol. Sweden outlined that the cancelled international credits cannot be utilized in any way, sold or used to fulfil commitments under the Kyoto Protocol and therefore the financial support related to the cancelled international credits is reported as climate finance.

18. In addition to the EU target, in 2009 Sweden set a national target for climate change to reduce GHG emissions by 40 per cent below the 1990 level by 2020. This target applies to activities not included in the EU ETS and does not include the LULUCF sector. This target is more ambitious than the Swedish target within the joint EU target. According to the BR3, two thirds of the target will be reached by implementing domestic measures, while one third may be reached through supplementary measures (flexible mechanisms). Under the Swedish target, renewable energy sources are to provide at least 50 per cent of total energy consumption and the share of renewable sources in the transport sector should be at least 10 per cent. Sweden has chosen to express its national target for improved energy efficiency by 2020 as a 20 per cent reduction in energy intensity between 2008 and 2020.

19. Sweden has also set long-term targets to reduce its GHG emissions. In June 2017, the Swedish Parliament (Riksdag) adopted an ambitious and long-term climate policy (the National Climate Policy Framework) consisting of the Climate Act, new climate targets and a climate policy council. The Climate Act places responsibility on both the current and future governments for pursuing a climate policy that is based on the national climate target of zero net emissions by 2045 and negative emissions thereafter. Sweden aims to achieve this by reducing GHG emissions by at least 85 per cent by 2045 compared with 1990 levels. Supplementary measures may count towards achieving zero net emissions. The target includes a requirement that, by 2030, non-ETS GHG emissions in Sweden should be at least 63 per cent lower than emissions in 1990 and should be at least 75 per cent lower by 2040.

³ According to the EU transaction log, available at <http://ec.europa.eu/environment/ets/esdAllocations.do?languageCode=en>.

To achieve these targets, no more than 8 and 2 percentage points, respectively, of the emission reduction may be realized through supplementary measures. GHG emissions from domestic transport should be reduced by at least 70 per cent by 2030 compared with 2010 levels. Owing to political uncertainty resulting from the 2018 parliamentary elections, a new government had not been officially formed prior to the ERT’s review. However, Sweden informed the ERT that there is majority support for continuing to fulfil Sweden’s emission reduction targets within the newly elected parliament. The ERT commends Sweden for reporting on its ambitious domestic targets and plans for a fossil-free Sweden.

20. In its BR3 and CTF tables 2(a)–(f) Sweden reported a description of its target, including associated conditions and assumptions. CTF tables 2(a)–(f) contained the required information in relation to the description of the target of the EU and its 28 member States of reducing GHG emissions by 20 per cent below the 1990 level by 2020, which is the combined target of the EU and its 28 member States and not of each member State, as they have no specified targets under the Convention. Further information on the target and the assumptions, conditions and methodologies related to the target is provided in chapter 2 of the BR3.

2. Assessment of adherence to the reporting guidelines

21. The ERT assessed the information reported in the BR3 of Sweden and identified issues relating to completeness, transparency and adherence to the UNFCCC reporting guidelines on BRs. The findings are described in table 3.

Table 3
Findings on the quantified economy-wide emission reduction target from the review of the third biennial report of Sweden

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in CTF tables 2(b) and 2(c) Issue type: transparency Assessment: recommendation	Sweden reported NF ₃ emissions in CTF tables 2(b) and 2(c), even though NF ₃ is not included in the quantified economy-wide emission reduction target of the EU and its 28 member States under the Convention. During the review Sweden acknowledged that improvements could be made to its reporting in the CTF tables. The ERT recommends that Sweden report correct information in the CTF tables with regard to the gases included in its quantified economy-wide emission reduction target.

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

22. Sweden 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. Sweden 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.

23. Sweden reported on its progress in the achievement of its target and mitigation actions implemented since its BR2. Sweden also provided information on changes made 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. There have been no changes since the previous BR2.

24. Sweden reported on its self-assessment of compliance with its emission reduction target and national rules for taking action against non-compliance. To assess compliance with member States' contribution towards the EU target, a universal monitoring and review process is already in place for all EU member States (Monitoring Mechanism Regulation; EU Regulation No. 525/2013), which is described in detail in the BR3 of the EU.⁴ The Swedish national system for policies and measures and projections was established in 2015. Its aim is to ensure that PaMs and projections reported to the UNFCCC are reported in compliance with specified requirements. The Ordinance on Climate Reporting (SFS 2014:1434) is the legal basis for ensuring compliance with Sweden's PaMs and projections and the Ministry of the Environment and Energy is responsible for ensuring that Sweden meets these requirements.

25. The key overarching related cross-sectoral policy in the EU is the 2020 climate and energy package, adopted in 2009, which includes the revised EU ETS and the ESD. The package is supplemented by renewable energy and energy efficiency legislation and legislative proposals on the 2020 targets for CO₂ emissions from cars and vans, the carbon capture and storage directive, and the general programmes for environmental conservation, namely the 7th Environment Action Programme and the clean air policy package.

26. In operation since 2005, the EU ETS is a cap-and-trade system that covers all significant energy-intensive installations (mainly large point emissions sources such as power plants and industrial facilities) that produce 40–45 per cent of the GHG emissions of the EU. It is expected that the EU ETS will guarantee that the 2020 target (a 21 per cent emission reduction below the 2005 level) will be achieved for sectors under the scheme. The third phase of the EU ETS started in 2013 and the system now includes aircraft operations (since 2012) as well as N₂O emissions from chemical industries, PFC emissions from aluminium production and CO₂ emissions from some industrial processes which were not covered in the earlier phases of the EU ETS (since 2013).

27. The ESD became operational in 2013 and covers sectors outside the EU ETS, including transport (excluding domestic and international aviation, and international maritime transport), residential and commercial buildings, agriculture and waste, together accounting for 55–60 per cent of the GHG emissions of the EU. The aim of the ESD is to decrease GHG emissions in the EU by 10 per cent below the 2005 level by 2020 and includes binding annual targets for each member State for 2013–2020, which are underpinned by Sweden's national policy (see paras. 18 and 19 above).

28. Sweden introduced national-level policies to achieve its targets under the ESD and domestic emission reduction targets. The key policy reported is the new National Climate Policy Framework, adopted by the Swedish Parliament in June 2017 (government bill 2016/17:146). The Framework consists of a Climate Act, new national climate targets and a climate policy council (see para. 19 above). The new Framework includes ambitious climate targets for 2030 and a goal of zero net emissions by 2045. Sweden will pursue climate policies based on these national climate targets.

29. Sweden has introduced a range of cross-sectoral measures to reduce GHG emissions, with an emphasis on general economic instruments, supplemented with targeted climate measures. The main cross-sectoral measures are the energy and carbon dioxide taxes in the stationary and mobile energy sectors. An energy tax was introduced for petrol and diesel in 1924 and 1937, respectively, and was increased in two stages in 2011 and 2013. In 2016, the energy tax was increased again. The energy tax, based on the fossil carbon content in the fuel, was introduced in 1991 and has been increased incrementally since it was first implemented from SEK 0.25/kg CO₂ in 1991 to SEK 1.13/kg CO₂ in 2017. Both taxes are adjusted to changes in the consumer price index.

30. SEPA administers grants for local and regional investments in all non-ETS sectors to cut GHG emissions through the local climate investment programme (Climate Leap). The total effect of these investments is estimated to be over 10 Mt CO₂ eq during the technical

⁴ Available at <https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/national-communications-and-biennial-reports-annex-i-parties/third-biennial-reports-annex-i>.

lifespan of the investments. Other cross-sectoral PaMs are the environmental code and planning legislation, the Fossil Free Sweden initiative, climate and energy advice, and research and development measures.

31. Sweden highlighted the domestic mitigation actions that are under development, such as an increased budget for Climate Leap; increased energy tax for combined heat and power plants within the EU ETS; support to municipalities to facilitate wind farms; increased financial support for solar power from SEK 1.39 billion for the period 2016–2019 to SEK 3.34 billion for the period 2017–2020; introduction of the Industrial Leap reform; tax on air travel; an emission reduction obligation (fuel change); the bonus-malus system for light vehicles; an electric vehicle premium; charge at home grant; and eco-bonus system for heavy transport. Planned national-level measures provide a foundation for significant additional actions for Sweden to achieve its 2020 emission reduction target. Table 4 provides a summary of the reported information on the PaMs of Sweden.

Table 4

Summary of information on policies and measures reported by Sweden

<i>Sector</i>	<i>Key PaMs</i>	<i>Estimate of mitigation impact by 2020 (kt CO₂ eq)</i>	<i>Estimate of mitigation impact by 2030 (kt CO₂ eq)</i>
Policy framework and cross-sectoral measures	EU ETS	NE	NE
	Energy tax	NE	NE
	Carbon dioxide tax	NE	NE
	Fossil Free Sweden initiative	NE	NE
Energy			
Production of electricity and district heating	Energy tax, carbon dioxide tax, electricity certificates system, EU ETS	19	14
	Initiatives for wind power	NE	NE
	Support for solar power	NE	NE
Residential and service sector	Energy tax, carbon dioxide tax, building regulations, energy declarations, the eco-design directive, mandatory energy labelling	0.4	0.4
Industrial emissions from combustion and processes, and product use	Hydrogen Breakthrough Ironmaking Technology (HYBRIT)	NE	NE
	EU regulation on fluorinated greenhouse gases and Best Available Techniques reference document, EU regulation on mobile air-conditioning units in cars, Swedish regulation on fluorinated gases and ozone-depleting substances	0.7	NE
Transport	Energy tax, carbon dioxide tax	2.3	NE
	Emission performance standards for new vehicles and targeted instruments related to the energy consumption of the vehicle fleet	2.6	4.3
		4.3	NE
	Targeted instruments to promote the introduction of renewable transport fuels		
Agriculture	Measures under the Rural Development Programme	NE	NE
	Support for biogas production	NE	NE

<i>Sector</i>	<i>Key PaMs</i>	<i>Estimate of mitigation impact by 2020 (kt CO₂ eq)</i>	<i>Estimate of mitigation impact by 2030 (kt CO₂ eq)</i>
LULUCF	Forestry Act and Swedish National Forest Programme	NE	NE
Waste	Rules on municipal waste planning and on producer responsibility for certain products, landfill tax (2000), bans on landfill of combustible waste (2002) and of organic waste (2005)	1.9	NE

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

(b) Policies and measures in the energy sector

32. Energy accounted for 73 per cent of Sweden's emissions in 2015, the largest source of emissions in Sweden. Emissions fluctuate between the years mostly owing to the weather conditions that influence electricity and heat production. Fluctuations in emissions from coke production and refineries relate to changes in the economic development of industries. There is a strong policy focus on the energy sector, with a framework agreement on Swedish energy policy agreed in 2016 to set a target of 100 per cent renewable electricity production by 2040 and 50 per cent more efficient energy use by 2030 compared with the 2005 level.

33. **Production of electricity and district heating sector.** The highest mitigation impact in this sector is a group of measures: energy tax, carbon dioxide tax, electricity certificate system and the EU ETS. Sweden projects that implementation of those measures will lead to a 19 Mt CO₂ eq emission reduction by 2020, in comparison with the emission level in 1990. Other significant PaMs are initiatives for wind power, support for solar power and tax relief for microproduction of renewable energy.

34. The production of district heating has risen approximately 50 per cent since 1990. At the same time, GHG emissions from this source have remained relatively stable, because the expansion has largely been achieved by the increased use of biofuels, while the use of oil and coal has declined. The carbon dioxide tax is one of the main factors behind this trend, but the electricity certificate system is also important in phasing out fossil fuels in the sector. The low emissions from electricity generation are explained by the fact that nuclear power and hydropower account for a dominant share of production, while additional production of electricity in recent years comes mainly from biomass-fired combined heat and power plants and wind power plants.

35. **Residential and commercial/institutional sectors.** The most significant mitigation impacts are due to the energy tax, carbon dioxide tax, changes to building regulations, energy declarations, the eco-design directive and mandatory energy labelling, with a 0.4 Mt CO₂ eq emission reduction by 2020 compared to 1990 emission levels.

36. GHG emissions from the residential, commercial and institutional sectors (heating other than district heating) have fallen significantly since 1990. The energy and carbon dioxide taxes are instruments that contribute most to reducing the use of fossil fuels in this sector. The level of taxes on fossil-fuel use for heating in the sector has risen steadily since 1990. This has made it considerably more expensive to use fossil fuels than if energy taxation was kept at its 1990 level. Additionally, oil prices and the available technologies for fossil-fuel substitutes have also had a significant impact on decreasing emission trends in the sector.

37. As well as carbon dioxide and energy taxes, there are several instruments targeting energy use in buildings. Some of the most important ones include changes to building regulations, the introduction of energy performance certificates, and the eco-design, energy labelling and energy efficiency directives. In addition, there are instruments such as technology procurement, network initiatives and information campaigns at the local, regional and national level.

38. **Industrial emissions and product use.** Total emissions from combustion in manufacturing industries are trending downward. The instruments primarily affecting combustion emissions from the industrial sector are the EU ETS, energy and carbon dioxide taxes, the electricity certificate system and the Environmental Code. IPPU emissions have come almost entirely within the scope of the EU ETS since its expansion for the third trading period (2013–2020). These processes are also regulated by the Environmental Code requirement to use the best available technology. In 2017, the “Hydrogen Breakthrough Ironmaking Technology” initiative was given financial support to find solutions to reducing CO₂ emissions from the steel industry.

39. Industrial Leap is a new reform programme, which will be funded in Sweden’s 2018 budget. This programme will provide financial resources amounting to SEK 300 million each year from 2018 to 2040 to support the development of technologies and processes to significantly reduce process-related GHG emissions in Swedish industry. Sweden also implemented a regulation on fluorinated gases in 2006 that complements the EU regulation. The regulation includes provisions for cooling and air conditioning and heat pump equipment. These measures on fluorinated gases, including the EU regulation, are estimated to reduce emissions by 0.7 Mt CO₂ eq each year by 2020 compared with the 1990 emission level.

40. **Transport sector.** GHG emissions from domestic transport, where road transport dominates, increased after 1990, reaching a peak in 2006–2007 and then declined. However, since 2013, there has been a slowdown in the decline. The decrease in emissions since 2006 can be attributed to policy instruments introduced both nationally and at the EU level. Emission performance standards for new vehicles, vehicle taxes and vehicle fuel taxes have had the most significant impact on reducing GHG emissions. Sweden has also set an ambitious domestic transport sector target of a 70 per cent reduction by 2030.

41. Sweden outlined a number of new initiatives in the transport sector that have been included in the 2018 budget proposal. These include an emission reduction obligation (fuel charge) scheduled to come into effect on 1 July 2018, which places an obligation on petrol and diesel suppliers to increase biofuel blending. In July 2018, Sweden introduced the bonus-malus system for new light vehicles that is an innovative ‘carrot and stick’ approach. The system targets vehicles with low CO₂ emissions to qualify for a bonus at the time of purchase, while vehicles with high CO₂ emissions will be taxed at a higher rate for the first three years. The Climate Leap programme aims to support infrastructure investments in municipalities, companies and organizations such as charging points for electric vehicles or investments in biogas plants.

42. Sweden introduced a tax on air travel from 1 April 2018, designed to reduce the climate impact of aviation through taxing commercial flights from Swedish airports. There are various levels of tax depending on the distance travelled.

(c) **Policies and measures in other sectors**

43. **Agriculture.** GHG emissions from the agriculture sector have been declining compared with the 1990 level; however, there are relatively few economic policy instruments directly targeting GHG emissions in the sector. The Government has introduced measures to reduce fossil-fuel use in farming and to increase awareness, and measures to reduce emissions from manure and fertilizer management and from land use. The Rural Development Programme, launched in 2014, has a SEK 36 billion budget to undertake a number of actions, including on climate mitigation, such as increasing energy efficiency, production and use of renewable energy (e.g. biogas production), improved manure handling, more efficient use of nitrogen and the restoration and establishment of wetlands.

44. In January 2015 Sweden introduced a support scheme for biogas production through anaerobic digestion of manure, which offers benefits in CH₄ reduction as well as the substitution of fossil energy. The biogas generated can be used to generate electricity or heat, or as a vehicle fuel. The Rural Network is a programme to bring together actors at the local, regional and central level to exchange information and experiences.

45. **LULUCF.** Sweden has over 58 per cent of productive forest land and it is an important natural resource that provides scope for bio-based energy supply. The Swedish Forestry Act

(dating from 1993), sets out the twin objectives of production and environmental protection. Forest owners are given responsibility to conduct long-term sustainable forest management which influences CO₂ removals and emissions in various ways (e.g. via harvested wood products or fossil-fuel substitutes).

46. Sweden's Environmental Code also aims to promote sustainable development with regulations on land drainage, and the protection and restoration of peatlands with high carbon stocks. Sweden sets targets for the conservation and protection of areas containing both wetlands and forest lands, and such areas are excluded from felling programmes. In 2015, the Government initiated a dialogue with stakeholders in the National Forest Programme to increase the national supply of bio-based alternatives. The Forest Kingdom Initiative, a SEK 40 million programme running from 2012 to 2015, provided advice and training for increased production and to promote environmental awareness of offers to increase the uptake of carbon.

47. **Waste management.** Since 1990 CH₄ emissions from landfill sites have declined significantly, owing to an expansion of CH₄ recovery from landfills and reduced landfill disposal of organic materials and waste incineration with energy recovery. Demand for waste as a fuel for district heating has also encouraged diversion from landfill to incineration. PaMs at both the national and EU level have established this decline.

48. Since 1991, all municipalities in Sweden have been required to have a waste plan; and a national waste plan and prevent programme act as guidance in developing these and setting priorities. In 2000, Sweden introduced a tax on landfill waste. Starting at SEK 250 per tonne it has increased gradually to SEK 500 per tonne in 2015. In 2002, a ban on landfilling combustible materials was introduced and in 2005 a similar ban on organic material was implemented. These initiatives help to prevent and reduce the adverse effects on human health and the environment from landfilling.

49. Analysis on the effect of these measures in the waste sector found that the waste management measures reduced GHG emissions by 1.7 Mt CO₂ eq by 2015 compared with the emission level in 1990 and are projected to reduce emissions by 1.9 Mt CO₂ eq by 2020.

(d) Response measures

50. Sweden reported on the assessment of the economic and social consequences of response measures. Sweden presented its policy for global development, which stipulated that an impact assessment is undertaken when decisions in a given policy area are judged to affect the goal of equitable and sustainable global development.

51. Sweden has not made any changes since the BR3 on its work to assess the economic and social consequences of response measures introduced as part of the country's climate strategy. Sweden's climate strategy encompasses many different types of measures and most sectors, both inside and outside the country.

(e) Assessment of adherence to the reporting guidelines

52. The ERT assessed the information reported in the BR3 of Sweden and identified issues relating to transparency and adherence to the UNFCCC reporting guidelines on BRs. The findings are described in table 5.

Table 5

Findings on the mitigation actions and their effects from the review of the third biennial report of Sweden

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 6 Issue type: transparency Assessment: recommendation	Sweden reported some energy-related PaMs in the industrial processes sector instead of the energy sector in its BR3 (table 3.3). During the review Sweden explained that the sectoral split was due to domestic policy reporting and recognized that improvements could be made. The ERT recommends that Sweden, in its next BR, organize the reporting of its PaMs correctly by sector, for example, emissions from industrial processes to be included in the IPPU sector and industrial emissions from combustion in the energy sector.
2	Reporting requirement specified in CTF table 3 Issue type: transparency Assessment: recommendation	The ERT noted that Sweden did not report the mitigation impacts of individual mitigation actions and their effects in CTF table 3. During the review Sweden explained that it is very difficult to provide a quantitative estimation of the impacts of individual mitigation actions and their effects because some actions affect more than one sector (e.g. energy and carbon dioxide taxes) and for other measures the mitigation impact is not easy to estimate. The ERT recommends that Sweden improve the transparency of its reporting in its next BR by reporting consistent information on individual mitigation impacts in CTF table 3 and, in cases where the estimated mitigation impacts of some mitigation actions and their effects are not reported in CTF table 3, provide explanations as to why such information is not reported. The latter information could be provided in either the BR or the footnotes to CTF table 3.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on BRs. 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.

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

53. For 2014 Sweden reported in CTF table 4 annual total GHG emissions excluding LULUCF of 53,836.24 kt CO₂ eq, which is 24.8 per cent below the 1990 level. In 2014 emissions from non-ETS sectors relating to the target under the ESD amounted to 34,522.65 kt CO₂ eq.

54. For 2015 Sweden reported in CTF table 4 annual total GHG emissions excluding LULUCF of 53,690.36 kt CO₂ eq, which is 25.1 per cent below the 1990 level. In 2015 emissions from non-ETS sectors relating to the target under the ESD amounted to 33,897.18 kt CO₂ eq.

55. Given that the contribution from LULUCF activities is not included in the target for the EU under the Convention, Sweden did not report the LULUCF values in CTF tables 4, 4(a)I and 4(a)II. During the review Sweden stated that it does not intend to use units from market-based mechanisms under the Kyoto Protocol and under the Convention. In CTF tables 4 and 4(b), Sweden did not report on units from market-based mechanisms in 2014 and 2015 towards the achievement of its 2020 target and used the notation key “NE”. In 2017 Sweden cancelled the use of international credits generated during the first commitment period of the Kyoto Protocol. Table 6 illustrates Sweden’s total GHG emissions, the contribution of LULUCF and the use of units from market-based mechanisms to achieve its target.

Table 6

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

<i>Year</i>	<i>Emissions excluding LULUCF (kt CO₂ eq)</i>	<i>Contribution of LULUCF (kt CO₂ eq)^a</i>	<i>Emissions including contribution of LULUCF (kt CO₂ eq)</i>	<i>Use of units from market-based mechanisms (kt CO₂ eq)</i>
1990	71 636.61	NA	71 636.61	–
2010	64 554.80	NA	64 554.80	NA
2011	60 554.99	NA	60 554.99	NA
2012	57 162.72	NA	57 162.72	NA
2013	55 537.40	NA	55 537.40	NA
2014	53 836.24	NA	53 836.24	NA
2015	53 690.36	NA	53 690.36	NA

Sources: Sweden's BR3 and CTF tables 1, 4, 4(a)I, 4(a)II and 4(b).

^a The EU's unconditional commitment to reduce GHG emissions by 20 per cent below the 1990 level by 2020 does not include emissions/removals from LULUCF.

56. In assessing the progress towards the achievement of the 2020 target, the ERT noted that Sweden's emission reduction target under the Convention is a reduction of 20 per cent below the 1990 level (see para. 13 above). In 2015 Sweden's annual total GHG emissions excluding LULUCF and NF₃ emissions were 25.1 per cent (53,690.36 kt CO₂ eq) below the base-year level without using units from market-based mechanisms. To assess the progress towards the achievement of the 2020 target, the ERT noted that Sweden's emission reduction target under the Convention from sectors under the ESD is 17 per cent below the 2005 level (see para. 16 above), while Sweden's emissions in 2015 (33,897.18 kt CO₂ eq) were already 20.7 per cent below the 2005 level (42,755.97 kt CO₂ eq). In addition to the EU target, in 2009 Sweden set a national target to reduce GHG emissions by 40 per cent below the 1990 level by 2020 for non-ETS sectors.

57. The ERT noted that Sweden is making substantial progress towards its emission reduction target by implementing mitigation actions that are delivering significant emission reductions. On the basis of the results of the projections under the WEM scenario (see para. 70 below), the ERT also noted that Sweden is likely to overachieve its target under the Convention, given that the projected GHG emissions in 2020 are expected to be 30.3 per cent lower than the 1990 level with existing measures. During the review Sweden acknowledged that to achieve the zero net emissions target by 2045 more efforts would be needed.

58. In the light of the information reported on the GHG emission trends and projections, including the fact that Sweden's GHG emissions in 2015 were already below the EU average 2020 target, Sweden seems to be well on track to meet its EU target.

(b) Assessment of adherence to the reporting guidelines

59. The ERT assessed the information reported in the BR3 of Sweden 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

60. Sweden reported updated projections for 2020, 2025, 2030 and 2035 relative to actual inventory data for 2015 under the WEM scenario. The WEM scenario reported by Sweden includes implemented and adopted PaMs until July 2016.

61. Sweden did not report a WAM scenario. During the review the Party explained that it considers measures to be “planned” and hence eligible for a WAM scenario only if they exist in a bill before parliament. Once the bill is enacted the measures are considered adopted and become part of the WEM scenario. As there were no PaMs at the parliamentary bill stage in July 2016 Sweden did not have any measures for a WAM scenario. Although not reported in detail or in the CTF tables, Sweden did provide a “1990 scenario” in its BR3 that could be considered to be a WOM scenario. Sweden provided definitions of its scenarios explaining that its WEM scenario includes policies such as the carbon dioxide and energy taxes, renewable transport fuel policies and bans on landfilling organic material, while its “1990 scenario” includes only measures that were already in place in 1990. Detailed projections by gas and by sector are provided for the WEM scenario, whereas only totals in graph form are provided for the “1990 scenario”. The definitions indicate that the WEM scenario was prepared according to the UNFCCC reporting guidelines on NCs and the UNFCCC reporting guidelines on BRs. The ERT considers that the “1990 scenario” would require some additional description if it were to be submitted as a WOM scenario in accordance with the guidelines, for example the nature of the projection and which PaMs were excluded.

62. The projections are presented on a sectoral basis (in line with the GHG inventory sectors) using different sectoral categories from those used in the reporting on mitigation actions and on a gas-by-gas basis for CO₂, CH₄, N₂O, PFCs, HFCs and SF₆ (treating PFCs and HFCs collectively in each case) for 1990–2035. The projections are also provided in an aggregated format for each sector as well as for a Party total using GWP values from the AR4. Sweden has provided additional subsectoral projections for most sectors (e.g. transport by mode) as well as providing sectoral projections on a gas-by-gas basis for the main gases relevant to each sector.

63. Sweden did not report emission projections for indirect GHGs such as carbon monoxide, nitrogen oxides, non-methane volatile organic compounds or sulfur oxides.

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

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

65. The methodology used for the preparation of the projections is largely the same as that used for the preparation of the emission projections for the BR2; the differences are mainly due to different underlying assumptions. Sweden reported supporting information in tabular format, explaining that the key differences in the assumptions since the BR2 relate to fuel prices, carbon prices and growth rates. The ERT noted that it would be helpful if a similar table were also provided outlining differences (if any) in the methodologies and models used. Sweden did not provide any details of the different models and approaches used in preparing projections for the different sectors or make a concrete reference to the information provided in the NC7.

66. To prepare its projections, Sweden relied on the following key underlying assumptions: annual GDP growth of 2.28 per cent to 2035, crude oil price of USD 109/barrel in 2020 and USD 117/barrel in 2035, and population of 10.6 million in 2020 and 11.5 million in 2030. The main variables and assumptions used were reported in CTF table 5. The assumptions were updated based on the most recent economic developments known at the time of the preparation of the projections.

67. Sweden provided information in CTF table 5 on assumptions, methodologies, models and approaches used, and on the key variables and assumptions used in the preparation of the projection scenarios. To explain the changes, Sweden provided supporting documentation. Sweden also provided information on sensitivity analyses.

68. Sensitivity analyses were conducted for a number of important assumptions, such as 30 per cent higher fossil-fuel prices, 30 per cent higher economic growth and 10 per cent higher mileage. The analysis found that in the higher mileage scenario emissions were approximately 1.2 Mt CO₂ eq higher in 2030 and in the higher fuel price scenario emissions were approximately 1.2 Mt CO₂ eq lower. The higher economic growth scenario resulted in

approximately 0.2 Mt CO₂ eq higher emissions, mainly owing to increased production in the industrial sector.

(c) Results of projections

69. The projected emission levels under different scenarios and information on the quantified economy-wide emission reduction target are presented in table 7 and the figure below.

Table 7
Summary of greenhouse gas emission projections for Sweden

	GHG emissions (kt CO ₂ eq per year)	Changes in relation to base-year ^a level (%)	Changes in relation to 1990 level (%)
Quantified economy-wide emission reduction target under the Convention ^b	NA	NA	NA
Inventory data 1990 ^c	71 636.61	NA	NA
Inventory data 2015 ^c	53 690.36	-25.1	-25.1
WEM projections for 2020 ^d	49 898.62	-30.3	-30.3
WEM projections for 2030 ^d	45 603.26	-36.3	-36.3

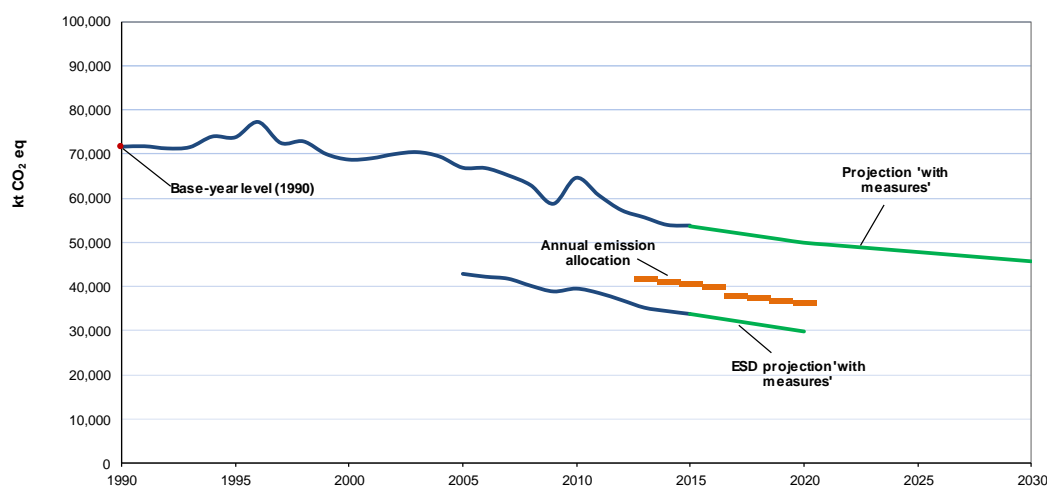
^a “Base year” in this column refers to the base year used for the target under the Kyoto Protocol, while for the target under the Convention it refers to the base year used for that target.

^b The quantified economy-wide emission reduction target under the Convention is a joint target of the EU and its 28 member States. The target is to reduce emissions by 20 per cent compared with the base-year (1990) level by 2020.

^c From Sweden’s BR3 CTF table 6.

^d From Sweden’s BR3.

Greenhouse gas emission projections reported by Sweden



Sources: (1) data for the years 1990–2015: Sweden’s 2017 annual inventory submission, version 2; total GHG emissions excluding LULUCF; (2) data for the years 2015–2030: Sweden’s NC7 and BR3; total GHG emissions excluding LULUCF.

70. Sweden’s total GHG emissions excluding LULUCF in 2020 and 2030 are projected to be 49,898.62 and 45,603.26 kt CO₂ eq, respectively, under the WEM scenario, which represents a decrease of 30.3 and 36.3 per cent, respectively, below the 1990 level. The 2020 projections suggest that Sweden will continue contributing to the achievement of the EU target under the Convention.

71. Sweden's target for non-ETS sectors is to reduce its total emissions by 17 per cent below the 2005 level by 2020. Sweden's AEAs, which correspond to its national emission target for non-ETS sectors, change linearly from 41,685 kt CO₂ eq in 2013 to 36,080 kt CO₂ eq for 2020. According to the projections under the WEM scenario, emissions from non-ETS sectors are estimated to reach 29,700 kt CO₂ eq by 2020. The projected level of emissions under the WEM scenario is 17.7 per cent below the AEAs for 2020, representing a reduction in emissions of around 30 per cent below the 2005 level. The ERT noted that this suggests that Sweden expects to meet its target under the WEM scenario (see para. 56 above).

72. In addition to its target for non-ETS sectors, Sweden committed itself to achieving a domestic target of a 40 per cent reduction in emissions below the 1990 level by 2020, one third of which can be met by investing in emission reductions in other countries. The projections indicate that Sweden expects to meet its domestic target, with the Government now intending to try to meet it using only domestic measures. The projections indicate a gap-to-target of 900 kt CO₂ eq in 2020 if only domestic measures are considered. In June 2017 the Swedish Parliament introduced further targets for the non-ETS sector of 63 per cent below the 1990 level in 2030 and 75 per cent below the 1990 level in 2040, of which 8 per cent and 2 per cent, respectively, may be met by supplementary measures. A new target was also introduced for domestic transport emissions of 70 per cent below the 2010 level by 2030. By 2045, Sweden aims to have no net emissions of GHGs into the atmosphere. The projections estimate ESD emissions of 26,000 kt CO₂ eq in 2030, indicating a gap-to-target of around 9,000 kt CO₂ eq compared with the new 2030 target. The projections estimate transport emissions in 2030 to decrease by around 35 per cent below the 2010 level. To meet the new targets, new PaMs will be required beyond what is in the current WEM scenario.

73. Sweden presented the WEM scenario by sector for 2020 and 2030, as summarized in table 8.

Table 8

Summary of greenhouse gas emission projections for Sweden presented by sector

<i>Sector</i>	<i>GHG emissions and removals (kt CO₂ eq)</i>			<i>Change (%)</i>	
	1990	2020	2030	1990–2020	1990–2030
		<i>WEM</i>	<i>WEM</i>	<i>WEM</i>	<i>WEM</i>
Energy (not including transport)	17 353	7 907	7 278	–54.4	–58.1
Transport	19 917	15 338	13 443	–23.0	–32.5
Industry/industrial processes	19 497	14 782	14 421	–24.2	–26.0
Agriculture	7 615	6 354	5 882	–16.6	–22.8
LULUCF	–36 703	–43 322	–42 222	18.0	15.0
Waste	3 740	1 058	723	–71.7	–80.7
Other (Product use and Working machinery)	3 483	4 459	3 857	34.5	28.0
Total GHG emissions without LULUCF	71 637	49 899	45 603	–30.3	–36.3

Source: Sweden's BR3 CTF table 6.

74. According to the projections reported for 2020 under the WEM scenario, the most significant emission reductions are expected to occur in the energy (excluding transport) sector, amounting to projected reductions of 9,446.52 kt CO₂ eq (54.4 per cent between 1990 and 2020). The pattern of projected emissions reported for 2030 under the same scenario remains the same, with projected reductions in the energy (excluding transport) sector of 10,075.80 kt CO₂ eq (58.1 per cent between 1990 and 2020). Most of the reductions in the

energy (excluding transport) sector had already occurred by 2015 and were mainly driven by the switch to electric and district heating in residential, commercial and institutional premises. The transport sector is projected to account for the largest portion of emission reductions from 2015 to 2020 and 2030.

75. Sweden presented the WEM scenario by gas for 2020 and 2030, as summarized in table 9.

Table 9

Summary of greenhouse gas emission projections for Sweden presented by gas

Gas	GHG emissions and removals (kt CO ₂ eq)			Change (%)	
	1990	2020	2030	1990–2020	1990–2030
		WEM	WEM	WEM	WEM
CO ₂	57 548	40 707	37 543	–29.3	–34.8
CH ₄	7 640	4 312	3 628	–43.6	–52.5
N ₂ O	5 773	4 262	4 096	–26.2	–29.1
HFCs	5	535	253	11 527.8	5 389.6
PFCs	569	34	34	–94.1	–94.1
SF ₆	102	50	50	–51.2	–50.9
NF ₃	–	–	–	–	–
Total GHG emissions without LULUCF	71 637	49 899	45 603	–30.3	–36.3
Total GHG emissions with LULUCF	34 933	6 576	3 382	–81.2	–90.3

Source: Sweden's BR3 CTF table 6.

76. For 2020 the most significant reductions are projected for CO₂ emissions: 16,841.27 kt CO₂ eq (29.3 per cent) between 1990 and 2020. CH₄ emissions are projected to decline by 3,328.06 kt CO₂ eq (43.6 per cent) and N₂O emissions by 1,511.68 kt CO₂ eq (26.2 per cent) over the same period.

77. For 2030 the situation is similar, with the most significant reductions projected for CO₂ emissions: 20,004.88 kt CO₂ eq (34.8 per cent) between 1990 and 2020. CH₄ emissions are projected to decline by 4,011.37 kt CO₂ eq (52.5 per cent) and N₂O emissions by 1,677.92 kt CO₂ eq (29.1 per cent) over the same period.

78. Sweden provided information in tabular format comparing differences in the key assumptions with the projections presented in the NC7/BR3, those presented in the NC6 and those presented in the BR2. GDP growth rate assumptions are broadly comparable across the three sets of projections (2.28 per cent per annum in the NC7/BR3). Fossil-fuel prices are slightly lower in the NC7/BR3 projections (oil is projected to be USD 117/barrel in 2035), whereas future ETS carbon prices and new renewable electricity assumptions are higher (EUR 42/t CO₂ and 28.4 TWh, respectively). As with the projections presented in Sweden's BR2, the BR3 projections are consistent with the projections submitted as part of the NC7 and were prepared in accordance with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories using GWPs from the AR4 and, owing to the updated GWPs used, the numbers are not directly comparable with the projections presented in the NC6.

(d) Assessment of adherence to the reporting guidelines

79. The ERT assessed the information reported in the BR3 of Sweden and identified issues relating to completeness, transparency and adherence to the UNFCCC reporting guidelines on BRs. The findings are described in table 10.

Table 10

Findings on greenhouse gas emission projections reported in the third biennial report of Sweden

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	<p>Reporting requirement^a specified in CTF Table 5</p> <p>Issue type: completeness</p> <p>Assessment: encouragement</p>	<p>Sweden has reported historical data for the key variables and assumptions used in its projections in CTF table 5 for 2014, but not for the historical years before that. The ERT also noted that there are units associated with population, household size and exchange rates that appear to be incorrectly specified in the table.</p> <p>During the review Sweden explained that, while some of the historical data may be available and could be provided in future, other elements may not be available.</p> <p>The ERT reiterates the encouragement made in the previous review report that Sweden report the historical data to improve the completeness of its reporting and ensure that the correct units are used for all variables.</p>
2	<p>Reporting requirement^a specified in paragraph 28</p> <p>Issue type: completeness</p> <p>Assessment: encouragement</p>	<p>Sweden did not report in its NC7 a WOM scenario or a WAM scenario.</p> <p>During the review Sweden provided detailed information on a scenario that only considers measures in place in 1990, as briefly described in the NC7. Sweden also explained that it considers measures to be “planned” and hence eligible for a WAM scenario only if they exist in a bill before parliament. Once the bill is enacted the measures are considered adopted and become part of the WEM scenario. As there were no PaMs at the parliamentary bill stage in July 2016 Sweden did not have any measures for a WAM scenario.</p> <p>The ERT encourages Sweden to provide a WOM and a WAM scenario, as applicable, to improve the completeness of its reporting.</p>
3	<p>Reporting requirement^a specified in paragraph 42</p> <p>Issue type: completeness</p> <p>Assessment: encouragement</p>	<p>Sweden has reported detailed descriptions of the models and methods used in preparing its projections, in annex 5 to its NC7, but did not provide similar information or a reference to the NC7 information in its BR3.</p> <p>During the review Sweden acknowledged that improvements could be made to its reporting.</p> <p>The ERT reiterates the encouragement made in the previous review report that Sweden include an overview of methods and models used in the BR to improve transparency.</p>
4	<p>Reporting requirement^a specified in paragraph 43</p> <p>Issue type: transparency</p> <p>Assessment: encouragement</p>	<p>Sweden has reported detailed descriptions of the models used in preparing its projections in annex 5 to its NC7 but did not provide information on the synergies and overlaps between the different models used.</p> <p>During the review Sweden explained that some models used the same underlying assumptions whereas others were independent of each other.</p> <p>The ERT reiterates the encouragement made in the previous review report that Sweden provide concise information highlighting the synergies and overlaps between the different models used.</p>

Note: 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.

^a Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines 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 Sweden reported information on the provision of financial, technological and capacity-building support required under the Convention.

81. Sweden provided details on what “new and additional” support it has provided and clarified how this support is “new and additional”. Sweden’s definition is based on the common definition that climate financing should be additional to the international development aid goal, which, for Sweden, is 0.7 per cent of gross national income. Sweden has exceeded the 0.7 per cent goal and has broad support from the Swedish Parliament to continue delivering 1 per cent of gross national income as ODA. In addition to the climate finance within ODA, Sweden also contributes to international climate finance through other official flows, such as the Swedish Programme for International Climate Initiatives, through the Kyoto Protocol flexible mechanism. Sweden has chosen to voluntarily cancel purchased emission reduction units and report them as climate finance. Against this background, Sweden considers all its climate finance during the period 2015–2016 to be “new and additional”.

82. Sweden reported on its financial support to non-Annex I Parties, distinguishing between support for mitigation and adaptation activities and recognizing the capacity-building elements of such support. During the review Sweden explained how it tracks support for adaptation and mitigation using the Rio Markers. The components are marked using a scale of 0–2, where 2 represents a “principal objective”, 1 is a “significant objective” and 0 is “not targeted”. In its climate finance reporting, Sweden includes the full amount of finance provided to components that have climate change as a principal objective, but only 40 per cent of the finance provided goes to components with climate change as a significant objective. The disbursed amounts presented in the BR3 (annex 1, CTF tables 7 and 7(b)) were weighted using Rio Marker coefficients.

83. During the review Sweden provided more detailed information that enhanced the efficiency, transparency and robustness of the tracking system, such as a description of the Green Tool Box developed by SIDA. The system strengthens the tracking system in streamlining of the provision of support, and by monitoring and assessing, from the policy to the operation level. The information is publicly available and fully accessible⁵ online.

84. Sweden highlighted how it is currently making efforts to enable climate finance reporting through IATI with the aim for a pilot project in 2018. The OECD DAC gender policy marker is also used to track gender equality integration in climate finance. Sweden’s approach enhances transparency, because the same gross list of contributions is presented in CTF table 7(b) for reporting in both the NC7 and the BR3, as well as for reporting the annual report to the EU on the Monitoring Mechanism Regulation. This also enhances the coherence between the three reports and reduces the burden of reporting.

(b) Assessment of adherence to the reporting guidelines

85. The ERT assessed the information reported in the BR3 of Sweden 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.

⁵ See <https://www.sida.se/English/partners/resources-for-all-partners/methodological-materials/green-tool-box/>.

2. Financial resources

(a) Technical assessment of the reported information

86. Sweden reported information on the provision of financial support required under the Convention, including on financial support provided, committed and pledged, allocation channels and annual contributions.

87. Sweden indicated what “new and additional” financial resources it has provided and clarified how it has determined such resources as being “new and additional” (see para. 81 above).

88. Sweden described how its resources address the adaptation and mitigation needs of non-Annex I Parties through the key principle for international development cooperation and climate finance. It described the key role of national ownership in securing long-term sustainability of climate change-related initiatives. Sweden also highlighted that through its bilateral work the countries’ needs, priorities and strategies are weighed into the strategies, and a fundamental entry point for all of SIDA’s financial contributions.

89. Sweden reported detailed information on assistance to developing countries on adaptation to address adverse effects. The bilateral ODA is channelled through SIDA, with the emphasis on low-income and middle-income countries and increasing focus on supporting countries with climate change adaptation to meet the needs of country partners.

90. With regard to the most recent financial contributions aimed at enhancing the implementation of the Convention by developing countries, Sweden reported that its climate finance has been based on the policy framework of Sweden, which integrates climate change perspectives on all international development cooperation and with emphasis on low-income and middle-income countries. As described in the BR3, national ownership of the long-term sustainability of climate initiatives is directed towards recipient countries and the organization’s own needs, priorities and strategies are weighted into Sweden’s strategies and is a fundamental entry point for all bilateral support. The support also increasingly emphasizes gender integration. Financial support during the period 2015–2016 and its allocation between adaptation, mitigation and cross-cutting measures indicates that more emphasis was given to cross-cutting and adaptation measures. The ERT commends Sweden for reporting its effort to champion gender integration in climate finance. Table 11 includes some of the information reported by Sweden on its provision of financial support.

Table 11

Summary of information on provision of financial support by Sweden in 2015–2016

(Millions of United States dollars)

<i>Allocation channel of public financial support</i>	<i>Year of disbursement</i>	
	<i>2015</i>	<i>2016</i>
Official development assistance		
Climate-specific contributions through multilateral channels including:	59.81	119.33
Global Environment Facility	12.42	19.31
Least Developed Countries Fund		17.52
Special Climate Change Fund		
Adaptation Fund		23.32
Green Climate Fund	35.57	46.72
Trust Fund for Supplementary Activities	0.54	0.23
Financial institutions including regional development banks	11.28	12.20
United Nations bodies	–	–
Other	–	–
Climate-specific contributions through bilateral, regional and other channels	–	–

Other

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

91. Sweden applied Rio Markers to estimate climate-related multilateral funding support. The Green Tool Box was used to monitor and assess the climate-related bilateral ODA, when tracking and monitoring financial support from public sources. The system enhances information flow from policy to operation level and improves transparency, monitoring and assessment of support both vertically and horizontally. Sweden also made efforts to enable climate finance reporting through IATI.

92. To further enhance its data reporting system, Sweden made efforts to harmonize its data system to support the preparation of NCs, BRs and the report on the EU Monitoring Mechanism Regulation. The OECD DAC gender policy marker was also used to track gender integration in climate finance of Sweden. This harmonization aimed to increase coherence between reports and reduce the burden of reporting.

93. Sweden reported on its climate-specific public financial support, totalling USD 364 million in 2015 and USD 445 million in 2016. Sweden reported the disbursed amounts for the two years.

94. Sweden doubled its multilateral climate finance from 2015 to 2016. Sweden highlighted that it is the largest donor per capita in the world to the Financial Mechanism under the Convention: the Green Climate Fund and the Global Environment Facility. In 2016 Sweden provided a USD 15.3 million contribution to the Adaptation Fund and was also one of the first donors to provide support to the Capacity-building Initiative for Transparency. In addition, Sweden provided climate finance through other multilateral climate change funds, such as the Least Developed Countries Fund.

95. During the reporting period, Sweden placed a particular focus on bilateral adaptation support to developing countries. Bolivia (Plurinational State of), Ethiopia, Kenya, Mali, Mozambique, the United Republic of Tanzania and Zambia were the countries receiving the largest percentage of bilateral climate change support, amounting to USD 65–80 million, on aggregate, during the period 2015–2016. 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 12.

Table 12

Summary of information on channels of financial support used in 2015–2016 by Sweden

(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	78.50	65.60	-12.90	-16.4	21.6	14.7
Adaptation	104.84	203.10	98.25	93.7	28.8	45.6
Cross-cutting	180.35	176.44	-3.91	-2.2	49.6	39.6
Other	363.69	445.14	81.44	22.4	100.0	100.0
Total					100.0	100.0
Detailed information by type of channel						
Multilateral channels						
Mitigation	2.57	9.03	6.45	250.9	4.3	7.6
Adaptation	0.68	41.16	40.48	5 937.7	1.1	34.5
Cross-cutting	56.55	69.15	12.60	22.3	94.6	57.9
Other	0	0	-	-	-	-

Allocation channel of public financial support	Year of disbursement				Share (%)	
	2015	2016	Difference	Change (%)	2015	2016
Total	59.81	119.34	59.53	99.5	100.0	100.0
Bilateral channels						
Mitigation	75.93	56.57	-19.35	-25.5	25.0	17.4
Adaptation	104.16	161.94	57.78	55.5	34.3	49.7
Cross-cutting	123.80	107.29	-16.51	-13.3	40.7	32.9
Other	0	0	-	-	-	-
Total	303.88	325.80	21.91	7.2	100.0	100.0
Multilateral compared with bilateral channels						
Multilateral	59.81	119.34	59.53	99.5	16.4	26.8
Bilateral	303.88	325.80	21.91	7.2	83.6	73.2
Total	363.69	445.14	81.44	22.4	100.0	100.0

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

96. The BR3 includes detailed information on the financial support provided through multilateral, bilateral and regional channels in 2015 and 2016. More specifically, Sweden contributed through multilateral channels, as reported in the BR3 and in CTF table 7(a), USD 59 million and USD 119 million for 2015 and 2016, respectively.

97. The BR3 and CTF table 7(b) also include detailed information on the total financial support provided through bilateral, regional and other channels, amounting to USD 303 million and USD 326 million in 2015 and 2016, respectively.

98. 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 21.6, 28.8 and 49.6 per cent, respectively. In addition, 16.4 per cent of the total public financial support was allocated through multilateral channels and 83.6 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 14.7, 45.6 and 39.6 per cent, respectively. Furthermore, 26.8 per cent of the total public financial support was allocated through multilateral channels and 73.2 per cent through bilateral, regional and other channels.

99. The ERT noted that in 2015 a majority (94.6 per cent) of financial contributions made through multilateral channels were allocated to cross-cutting projects across mitigation and adaptation. Some funds were allocated for activities that are related to energy, as reported in CTF table 7(a). The corresponding allocations for 2016 were directed mostly to cross-cutting projects across mitigation and adaptation and some funds were allocated to energy. As reported in CTF table 7(b), in 2015 and 2016 Sweden provided financial support to various sectors following the OECD DAC classification.

100. CTF tables 7(a) and 7(b) include information on the types of financial instrument used in the provision of assistance to developing countries, which include grants and other. The ERT noted that the grants provided in 2015 and 2016 accounted for most of the total public financial support.

101. In the BR3 Sweden reported the use of SIDA to mobilize capital by linking public measures with market finance. SIDA helped lenders deal with risks by insuring eligible projects against losses. In 2016, SIDA provided guarantees of SEK 3.1 billion, which led to the mobilization of funds of around SEK 6.9 billion. Swedfund is Sweden's development finance institution and acts as a minority investor to catalyse financial commitments from both industrial and financial partners. At the end of 2016, Swedfund had 63 investments in companies and funds in 27 countries, of which more than half were located in Africa (see BR3, tables 5.8 and 5.9).

(b) Assessment of adherence to the reporting guidelines

102. The ERT assessed the information reported in the BR3 of Sweden and identified an issue relating to transparency and adherence to the UNFCCC reporting guidelines on BRs. The finding is described in table 13.

Table 13

Findings on financial resources from the review of the third biennial report of Sweden

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in CTF Table 7(b) Issue type: transparency Assessment: encouragement	Sweden did not classify the sectors consistently with the reporting requirements in CTF table 7(b), instead choosing to use nationally specific sectoral descriptions. The ERT noted that this is not in accordance with the UNFCCC reporting guidelines on BRs. During the review Sweden acknowledged the discrepancy in its sector reporting and explained that to enhance transparency across reports, it has made efforts to harmonize the reporting of data between NCs, BRs and the annual report to the EU on the Monitoring Mechanism Regulation. Sweden also noted that the information provided, although inconsistent with the sectors specified in CTF table 7(b), had more sector-specific details than stipulated by the reporting requirements. The ERT commends Sweden for the efforts made to harmonize the reporting data to reduce the burden of reporting and improve consistency among reports. In order to enhance transparency, the ERT recommends that Sweden, in its next BR, provide information in CTF table 7(b) using the relevant sectors, consistent with the UNFCCC reporting guidelines on BRs.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on BRs. 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.

3. Technology development and transfer, including information under Article 10 of the Kyoto Protocol**(a) Technical assessment of the reported information**

103. Sweden 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. Sweden provided examples of support provided for the deployment and enhancement of the endogenous capacities and technologies of non-Annex I Parties.

104. The ERT took note of the information provided in CTF table 8 on recipient countries, target areas, measures and activities related to technology transfer, sectors, sources of funding and activities undertaken, including their status.

105. The ERT noted that Sweden did not report on measures taken to promote, facilitate and finance the transfer and deployment of climate-friendly technologies. Sweden also did not provide any information on the success and failure stories in relation to technology transfer. Sweden did highlight a number of technology transfer examples, including the support provided to the Consultative Group for International Agricultural Research for agricultural research to improve food security support, to Mozambique to rehabilitate two old hydroelectric power stations using modern technology, and a project in Indonesia to focus on renewable energy and energy efficiency, as well as to provide joint research and development for a bioenergy road map.

(b) Assessment of adherence to the reporting guidelines

106. The ERT assessed the information reported in the BR3 of Sweden and identified issues relating to completeness, transparency and adherence to the UNFCCC reporting guidelines on BRs. The findings are described in table 14.

Table 14

Findings on technology development and transfer from the review of the third biennial report of Sweden

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 21 Issue type: completeness Assessment: recommendation	Sweden did not report on measures taken to promote, facilitate and finance technology transfer of climate-friendly technologies or support provided for the development and enhancement of the endogenous capacities of non-Annex I Parties. The ERT noted that this is not in accordance with the UNFCCC reporting guidelines on BRs. During the review Sweden acknowledged that improvements could be made to its reporting on technology transfer. The ERT recommends that Sweden provide detailed information on measures taken to promote, facilitate and finance technology transfer and its support for the endogenous capacities and technologies of non-Annex I Parties.
2	Reporting requirement specified in CTF Table 8 Issue type: transparency Assessment: encouragement	Sweden completed CTF table 8 using nationally specific sectoral descriptions, which were inconsistent with the reporting requirements under the UNFCCC reporting guidelines on BRs. During the review Sweden acknowledged that the sectoral descriptions used were not consistent with those set out in the UNFCCC reporting guidelines on BRs. To enhance transparency, the ERT recommends that Sweden, in its next BR, prepare CTF table 8 using the sectors consistent with the UNFCCC reporting guidelines on BRs and include any disaggregation, if necessary.
3	Reporting requirement specified in paragraph 22 Issue type: completeness Assessment: recommendation	Sweden did not provide textual information on measures and activities related to technology transfer implemented or planned since its last BR. During the review Sweden acknowledged that improvements could be made to its reporting on technology transfer. To ensure completeness the ERT recommends that Sweden provide textual information on measures and activities related to technology transfer implemented or planned since its last BR.
4	Reporting requirement specified in paragraph 21 Issue type: completeness Assessment: encouragement	Sweden did not provide information on success and failure stories related to the transfer of, access to and deployment of climate-friendly technologies for the benefit of non-Annex I Parties. During the review Sweden acknowledged that improvements could be made to its reporting on technology transfer. The ERT encourages Sweden to provide information on success and failure stories.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on BRs. 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

107. In the BR3 and CTF table 9, Sweden provided 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. Sweden described individual measures and activities related to capacity-building support in textual and tabular format. Sweden provided a number of examples to demonstrate where it focuses its capacity-building support. This includes the Energy Sector Management Assistance Programme, which is a partnership between the World Bank Group and 17 partners to help low- and middle-income countries reduce poverty and boost growth through environmentally sustainable energy solutions. SIDA supports the Huairou Commission, a partnership coalition working with women leaders at the grass-roots level. Sweden also supports the Capacity-building Initiative

for Transparency (established at the United Nations Climate Change Conference in Paris), and was one of the first to provide financial support for this initiative. The goal is to strengthen the institutional and technical capacities of developing countries to meet the enhanced transparency requirements of the Paris Agreement.

108. Sweden reported that it has supported climate-related capacity development relating to adaptation, mitigation and cross-cutting activities. Sweden also reported its response to the existing and emerging capacity-building needs of non-Annex I Parties by integrating these needs into the core of its operations. Sweden highlighted that it supports capacity-building projects taking place at the organizational, individual and institutional frameworks level and often a combination of the three. The capacity-building support often includes support directly to low-income country government institutions, such as support to government-funded universities in the Plurinational State of Bolivia, and support via multilateral institutions (e.g. the Landscape and Forest Management Multi-Donor Trust Fund with the World Bank in Mozambique).

(b) Assessment of adherence to the reporting guidelines

109. The ERT assessed the information reported in the BR3 of Sweden 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.

III. Conclusions and recommendations

110. The ERT conducted a technical review of the information reported in the BR3 and CTF tables of Sweden 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 Sweden's quantified economy-wide emission reduction target; assumptions, conditions and methodologies related to the attainment of the target; progress made by Sweden in achieving its target; and Sweden's provision of support to developing country Parties.

111. Sweden's total GHG emissions excluding LULUCF covered by its quantified economy-wide emission reduction target were estimated to be 26 per cent below its 1990 level, whereas total GHG emissions including LULUCF were 72.1 per cent below its 1990 level in 2016. The decrease in total emissions was driven mainly by a transition away from fossil-fuel use for the heating of residential, commercial and institutional premises. Other significant drivers have been a switch from fossil-fuel use to biofuels and electricity in the manufacturing combustion sector and reduced landfill gas emissions from the waste sector. Long-term ambitious policies have also driven emission reductions, such as energy and carbon taxes, which have existed since the early 1990s. The Swedish Forestry Act also drives a strong LULUCF sector as it has two overarching, equal objectives: to support forest production through effectively and responsibly producing sustainable yields; and to protect the environment.

112. Under the Convention, Sweden committed to contributing to the achievement of the joint EU quantified economy-wide emission reduction target of a 20 per cent reduction in emissions below the 1990 level by 2020. The target covers all sectors and CO₂, CH₄, N₂O, HFCs, PFCs and SF₆ expressed using GWP values from the AR4. Emissions and removals from the LULUCF sector are not included. The EU generally allows its member States to use units from the Kyoto Protocol mechanisms and new market mechanisms for compliance purposes up to an established limit and subject to a number of restrictions on the origin and the type of project. Companies can make use of such units to fulfil their requirements under the EU ETS.

113. Under the ESD, Sweden has a target of reducing its emissions by 17 per cent below the 2005 level by 2020. The 2015–2020 linear progression in Sweden's AEAs (its national emission target for non-ETS sectors) is 41,685.10 kt CO₂ eq in 2013 to 36,080.17 kt CO₂ eq in 2020. In addition, Sweden committed itself to achieving a domestic target of a 40 per cent reduction in emissions below the 1990 level by 2020. This target applies to activities not

included in the EU ETS and does not include the LULUCF sector. Sweden also highlighted that any surpluses for the years 2013 and 2014 would be deleted and that the Government proposes to delete surpluses for 2015 and 2016 if there are any.

114. Sweden's main policy relating to energy and climate change is the National Climate Policy Framework, adopted by the Swedish Parliament in June 2017 (Government bill 2016/17:146). The Framework consists of a Climate Act, new national climate targets and a climate policy council. The new Framework includes ambitious climate change goals for 2030 and a goal of zero net emissions by 2045. Sweden will pursue climate policies based on these national climate targets. Sweden's energy and carbon dioxide taxes have had the most significant GHG benefits. Some other policies that have delivered significant emission reductions include the local climate investment programme (Climate Leap), environmental code planning and building legislation, the Fossil Free Sweden initiative, and climate and energy advice.

115. In assessing the progress towards the achievement of the 2020 target, the ERT noted that Sweden's emission reduction target under the Convention is 20 per cent below the 1990 level. For 2015 Sweden reported in CTF table 4 annual total GHG emissions excluding LULUCF of 53,690.36 kt CO₂ eq, which is 25.1 per cent below the 1990 level. Sweden did not report on its use of units from market-based mechanisms to achieve its target.

116. The GHG emission projections provided by Sweden in the BR3 correspond to the WEM scenario. Under this scenario, emissions are projected to be 30.3 per cent below the 1990 level in 2020. According to the projections under the WEM scenario, emissions from non-ETS sectors are estimated to reach 29,700 kt CO₂ eq by 2020. On the basis of the reported information, the ERT concludes that Sweden expects to meet its 2020 target under the WEM scenario.

117. The ERT noted that Sweden is making progress towards its emission reduction target by implementing mitigation actions that deliver significant emission reductions. The projections indicate that Sweden expects to meet its domestic target of a 40 per cent reduction in emissions below the 1990 level by 2020, with the Government now intending to try to meet it using only domestic measures.

118. On the basis of the results of the projections for 2020 under the WEM scenario, the ERT notes that Sweden is likely to overachieve its emission reduction target by 2020, including further strengthening existing PaMs. In this regard Sweden informed the ERT that it plans to introduce new PaMs in order to achieve its emission reduction target.

119. Sweden provided climate financing to developing countries in line with its climate finance programmes. It has increased its contributions by 18 per cent since the BR2; its public financial support in 2015 and 2016 totalled USD 364 million and USD 445 million, respectively. For those years, Sweden provided more support for adaptation than mitigation. Sweden also provided support on technology transfer over the periods, such as agricultural technology to improve food production and hydroelectric power station rehabilitation.

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

- (a) To improve the completeness of its reporting by:
 - (i) Providing detailed information on measures taken to promote, facilitate and finance technology transfer and its support for the endogenous capacities and technologies of non-Annex I Parties (see issue 1 in table 14);
 - (ii) Providing textual information on measures and activities related to technology transfer implemented or planned since its last BR (see issue 3 in table 14);
- (b) To improve the transparency of its reporting by:
 - (i) Reporting correct information in the CTF tables with regard to the gases included in its quantified economy-wide emission reduction target (see issue 1 in table 3);

- (ii) Reporting its PaMs correctly by each sector, for example, emissions from industrial processes to be included in the IPPU sector and industrial emissions from combustion in the energy sector (see issue 1 in table 5);
- (iii) Reporting consistent information on individual mitigation impacts in CTF table 3 and, in cases where the estimated mitigation impacts of some mitigation actions and their effects are not reported in CTF table 3, provide explanations as to why such information is not reported (see issue 2 in table 5).

Annex

Documents and information used during the review

A. Reference documents

2018 GHG inventory submission of Sweden. Available at <https://unfccc.int/process/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/national-inventory-submissions-2018>.

BR3 of Sweden. Available at http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/1973425_sweden-br3-1-swe_br3_20171222.pdf.

BR3 of Sweden; Additional Information. Available at http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/1973425_sweden-br3-1-swe_add_table_nc7andbr3_20171222.pdf.

BR3 CTF tables of Sweden. Available at https://cop23.unfccc.int/sites/default/files/resource/530176_Sweden-BR3-2-Final%20CTF_swe_2018_v2.0.xlsx.

“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories”. Annex to decision 24/CP.19. Available at <http://unfccc.int/resource/docs/2013/cop19/eng/10a03.pdf>.

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

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Report on the technical review of the sixth national communication of Sweden. FCCC/IDR.6/SWE. Available at <https://unfccc.int/sites/default/files/resource/docs/2014/idr/swe06.pdf>.

“UNFCCC biennial reporting guidelines for developed country Parties”. FCCC/SBSTA/2014/INF.6. Annex I to decision 2/CP.17. Available at <http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf>.

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

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Anna-Karin Nystrom and Ms. Malin Kanth (SEPA), including additional material. The following documents¹ were provided by Sweden:

Swedish Code of Statutes (Svensk författningssamling) SFS 2014:1434. 2014. Climate Reporting Regulation (Klimatrapporteringsförordning).

Swedish Environmental Protection Agency (Naturvårdsverket). 2015. Agreement for joint work with Sweden's climate reporting (AgreeÖverenskommelse for gemensamt arbete med Sveriges klimatrapportering).

Svante Axelsson (national coordinator Fossil Free Sweden). Roadmap for Fossil Free competitiveness A Summary of Roadmaps from Swedish Business Sectors. <http://fossilfritt-sverige.se/roadmaps-for-fossil-free-competitiveness/>.

¹ Reproduced as received from the Party.