

Calculation of Sweden's Assigned Amount

Report to Facilitate the Calculation of the
Assigned Amount for the Second Commitment
Period of the Kyoto Protocol

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Preface

The Report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol is hereby submitted together with Sweden's submissions under the Kyoto Protocol for 2015 and 2016.

Sweden should have submitted a Report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol by April 15th, 2015, according to Decision 2/CMP.8, referring to Article 3 of the Kyoto Protocol. Sweden should also have submitted the report to the European Commission by January 15th, 2015, according to Article 19 of Implementing Regulation No 749/2014. However, the UNFCCC reporting software, CRF Reporter, was not considered functioning satisfactory during 2015 and during the spring of 2016 for Sweden to submit its reporting under the Kyoto Protocol.

The Conference of Parties invited Parties to submit their reporting as soon as practically possible, but no later than the corresponding delay in the CRF Reporter availability. It is therefore important to note that the CRF Reporter is still not considered fully functioning for reporting under the Kyoto Protocol (version 5.14.0, released on 3rd of May) and that Sweden has submitted its reporting under the Kyoto Protocol despite this fact.

Sweden therefore disclaims any differences between reported CRF-tables and the National Inventory Report as well as the Report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol. In case such differences occur, the National Inventory Report and the Report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol supersedes any information given in the CRF-tables.

The European Union, together with Iceland, has agreed to jointly fulfil its commitments for the second commitment period of the Kyoto Protocol. In regards to any differences in the reporting of Sweden and the European Union concerning the joint fulfilment of the second commitment period of the Kyoto Protocol, the European Union's Report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol is given precedent.

Contents

1	Introduction	1
2	Greenhouse gas inventories	2
2.1	Summary of national trends	2
3	Base years	5
3.1	Base year for CO ₂ , CH ₄ and N ₂ O	5
3.2	Base year for HFCs, PFCs and SF ₆	5
3.3	Base year for NF ₃	5
4	Terms of the joint fulfilment	6
4.1	Calculation of the assigned amounts	6
4.2	Emission levels allocated to the members of the joint fulfilment	7
5	Calculation of the assigned amounts	9
5.1	Assigned amount for the EU	9
5.2	Assigned amount for Sweden	10
6	Calculation of the commitment period reserve	11
6.1	Difference between the assigned amount for the second commitment period and the average emissions for the first three years of the preceding commitment period	12
6.2	Application of paragraphs 23 – 26 of decision 1/CMP.8	12
6.3	Application and calculation pursuant to paragraph 13 in the annex of decision 2/CMP.7	13
8	Land use, land-use change and forestry	15
8.1	Definition of forest for reporting under Articles 3(3) and 3(4)	15
8.2	Election of activities under Article 3(4)	15
8.3	Method for identification of land areas associated with LULUCF-activities	15
8.4	Accounting period	15
8.5	Application and calculation pursuant to paragraph 13 in the annex of decision 2/CMP.7	16
8.6	Forest management reference level	16
8.6.1	Technical correction	16
8.7	Natural disturbances	17
8.7.1	Country-specific information on the background levels of emissions associated with annual natural disturbances that have been included in its forest management reference level	17
8.7.2	Information on how the background levels have been estimated	17
9	National system	20
10	National registry	21
Annex I	2016 National Inventory Report for Sweden	
Annex II	Greenhouse Gas Inventories 1990-2014 for Sweden in Common Reporting Format (CRF)	
Annex III	Sweden's Initial Report under the Kyoto Protocol for the first commitment period.	

Summary

This report constitutes Sweden's *report to facilitate the calculation of the assigned amount* for the second commitment period of the Kyoto Protocol, answering to requirements set out in Decision 2/CMP.8 and 3/CMP.11. Sweden will fulfil its commitment under the second commitment period of the Kyoto Protocol jointly with the European Union (EU) and Iceland.

The individual assigned amount for Sweden was established at 315,554,578 assigned amount units (AAUs), in accordance with the notification of the terms of the agreement to fulfil the commitment jointly by the European Union, its Member States, and Iceland, see Council Decision (EU) 2015/1339.

The commitment period reserve was established at 283,999,120 AAUs, calculated following 11/CMP.1.

Sweden has selected 1995 as base year for fluorinated gases, including nitrogen trifluoride, in line with the first commitment period of the Kyoto Protocol.

Sweden has not elected any additional activities under Article 3(4) of the Kyoto Protocol. Afforestation, Reforestation, Deforestation, and Forest Management will be accounted for the entire commitment period.

Sweden intends to apply the provisions to exclude emissions from natural disturbances for the accounting of afforestation, reforestation and forest management.

Complete inventories of anthropogenic greenhouse gas emissions can be found in the 2016 National Inventory Report and related Common Reporting Format tables.

1 Introduction

This report constitutes the report to facilitate the calculation of the assigned amount for Sweden and Sweden as a part of the joint fulfillment by the European Union, its Member States and Iceland ("the joint assigned amount") pursuant to Article 3(7bis), (8) and (8bis) of the Kyoto Protocol for the second commitment period. The report also demonstrates the capacity to account for the emissions and assigned amount in accordance with decision 2/CMP.8 under the Kyoto Protocol period.

The European Union, its Member States and Iceland have agreed to the immediate implementation of the Doha Amendment as of 1st January 2013, and to fulfil the commitments under the second commitment period of the Kyoto Protocol jointly, see Council Decision (EU) 2015/1339.

The objective of this Report is to provide the information requested by the UNFCCC for the second commitment period of the Kyoto Protocol, as stated in Decision 2/CMP.8, and 3/CMP.11.

The following section addresses each of the requirements stated in Decision 2/CMP.8 and 3/CMP.11 to be delivered by the Report. Subsequent sections provide the required information related to the calculation of the assigned amount as well as decisions and calculation in relation to Land-Use, Land-Use Change and Forestry (LULUCF).

2 Greenhouse gas inventories

Complete inventories of anthropogenic emissions by sources and removals by sinks of greenhouse gases (GHGs) not controlled by the Montreal Protocol, recalculated in accordance with decision 4/CMP.7 for all years from 1990, or another approved base year or period under Article 3, paragraph 5, of the Kyoto Protocol, to the most recent year available, and prepared in accordance with Article 5, paragraph 2, of the Kyoto Protocol, and any relevant decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP) and the Conference of the Parties (COP). If the report is submitted at the same time as the submission of the Party's annual GHG inventories, only one inventory submission should be provided and both reports should be submitted in conjunction;

The complete inventories of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol are provided in the 2016 National Inventory Report, including the greenhouse gas inventory for 1990-2014 in Common Reporting Format, see Annex I and Annex II. A short summary can be found below.

The geographical coverage of the Swedish greenhouse gas inventory for the second commitment period of the Kyoto Protocol is equal to the geographical coverage for the first commitment period; the coverage is the Kingdom of Sweden.

2.1 Summary of national trends

Total greenhouse gas emissions in Sweden excluding LULUCF, expressed in carbon dioxide equivalents, were about 54.4 million tonnes in 2014 (Table 3.1). The emissions have decreased by approximately 1.6 million tonnes or 3 per cent compared to 2013. Emissions have decreased by about 24 per cent or by approximately 17 million tonnes between 1990 and 2014. In 2014, the net uptake within the land use, land-use change and forestry (LULUCF) sector has been estimated to about 45 million tonnes carbon dioxide equivalents (Table 3.1). During the period, net removals have varied between 31 and 45 million tonnes of carbon dioxide. Net removals are influenced by disturbances due to harvests and natural disturbances such as storms. The net uptake has increased slightly since 2008, which is due to decreased harvest of wood.

The national emissions of carbon dioxide (CO₂) were approximately 43 million tonnes in 2014, or 25 per cent lower than in 1990 (Table 3.1). The energy sector, including transport, accounted for almost 87 per cent the overall carbon dioxide emissions, which makes it the largest source of carbon dioxide in Sweden. The share of carbon dioxide of the overall GHG emissions in 2014 was approximately 80 per cent.

Emissions of methane (CH₄) arise mainly from agriculture and landfill sites, and amounted to about 5.2 million tonnes expressed as carbon dioxide equivalents in 2014 (Table 3.1). Since 1990, emissions have decreased by about 35 per cent, primarily due to measures implemented in the waste and agricultural sectors. The share of methane of the overall GHG emissions in 2014 was 9 per cent.

In 2014, the overall emissions of nitrous oxide (N₂O) were around 4.9 million tonnes expressed as carbon dioxide equivalents (Table 3.1), a reduction of about 16 per cent compared to 1990. Nitrous oxide emissions arise mainly from the agricultural sector through mineral fertilizer application (about 74 per cent), but also from the energy sector (16 per cent), wastewater handling (4 per cent) and industrial processes and product use (5 per cent). The industrial processes, product use and agricultural sectors give the largest contribution to the downward trend in nitrous oxide emissions. The share of nitrous oxide emissions of the total greenhouse gas emissions in 2014 was 9 per cent.

Total emissions of fluorinated greenhouse gases (PFCs, HFCs and SF₆) in 2014 were approximately one million tonnes expressed as carbon dioxide equivalents (Table 3.1). This corresponds to an increase of 73 per cent compared to 1990. The increase is due to the replacement of the ozone-depleting substances by HFCs. Emissions of HFCs show a declining trend as the emissions have decreased by about 17 per cent between 2009 and 2014. Fluorinated gases' share of the total greenhouse gas emissions in 2014 was 1.7 per cent.

Table 2.1. Greenhouse gas emissions by gas (kt CO₂ equivalents)

GREENHOUSE GAS EMISSIONS	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
CO ₂ incl. net CO ₂ from LULUCF	19 006	24 797	14 968	18 430	13 988	10 802	9 720	5 065	6 405	7 480	289	898	-3 451
CO ₂ excl. net CO ₂ from LULUCF	57 547	59 319	54 730	53 859	53 698	52 912	50 832	47 267	53 058	49 134	46 560	44 899	43 405
CH ₄ incl. CH ₄ from LULUCF	8 450	8 342	7 655	7 024	6 928	6 664	6 419	6 276	6 157	6 037	5 850	5 754	5 664
CH ₄ excl. CH ₄ from LULUCF	7 990	7 883	7 192	6 559	6 456	6 198	5 937	5 806	5 688	5 564	5 377	5 278	5 158
N ₂ O incl. N ₂ O from LULUCF	6 949	7 275	7 083	6 437	6 693	6 155	6 326	6 175	6 360	6 400	5 938	6 108	6 167
N ₂ O excl. N ₂ O from LULUCF	5 841	6 148	5 919	5 222	5 457	4 893	5 043	4 890	5 054	5 107	4 641	4 832	4 884
HFCs	5	149	631	880	913	938	968	973	950	915	870	839	807
PFCs	434	396	277	295	287	294	269	46	185	213	78	51	82
SF ₆	102	135	119	152	113	137	73	70	63	55	52	41	47
Total (incl. LULUCF)	34 945	41 094	30 733	33 218	28 922	24 991	23 774	18 605	20 119	21 100	13 078	13 691	9 316
Total (excl. LULUCF)	71 917	74 029	68 869	66 968	66 923	65 373	63 121	59 053	64 997	60 987	57 578	55 940	54 383

Table 2.2. Greenhouse gas emissions by sector (kt CO₂ equivalents)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
1. Energy	53 149	54 951	50 226	49 289	49 161	48 217	46 342	44 447	48 591	44 727	42 325	40 732	39 285
2. Industrial Processes and Product Use	7 024	7 242	7 474	7 770	7 765	7 716	7 508	5 659	7 516	7 052	6 700	6 541	6 433
3. Agriculture	8 004	8 276	7 947	7 229	7 407	7 027	7 087	6 870	6 942	7 338	6 824	7 049	7 143
4. LULUCF	-36 972	-32 936	-38 136	-33 750	-38 002	-40 382	-39 347	-40 447	-44 878	-39 887	-44 500	-42 249	-45 067
5. Waste	3 741	3 560	3 223	2 680	2 590	2 413	2 184	2 076	1 948	1 870	1 729	1 618	1 522
6. Other	NO	NO											
Total (including LULUCF)	34 945	41 094	30 733	33 218	28 922	24 991	23 774	18 605	20 119	21 100	13 078	13 691	9 316

3 Base years

3.1 Base year for CO₂, CH₄ and N₂O

For carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) the base year is 1990.

3.2 Base year for HFCs, PFCs and SF₆

According to Article 3(8) of the Kyoto Protocol, any Party may use 1995 instead of 1990 as its base year for hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆). In its Initial Report, Sweden has chosen 1995 as the base year for the greenhouse gases hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride, see Annex III.

3.3 Base year for NF₃

According to Article 3(8 bis) in Decision 1/CMP.8, "...Any Party included in Annex I may use 1995 or 2000 as its base year for nitrogen trifluoride for the purposes of the calculation referred to in paragraph 7 bis above."

Sweden has chosen 1995 as the base year for nitrogen trifluoride (NF₃), in line with other fluorinated greenhouse gases.

4 Terms of the joint fulfilment

The Kyoto Protocol, under Article 4, provides the option for Parties to fulfil their commitments under Article 3 jointly.

The European Union and its Member States already made use of this option during the first commitment period (2008-2012), fulfilling their respective commitments under Article 3(1) of the Kyoto Protocol jointly as a block of 15 countries, the Member States of the Union at the time of ratification of the Kyoto Protocol.

For the second commitment period, upon adoption of the Doha amendment to the Kyoto Protocol, the European Union, its Member States and Iceland stated that the European Union and its 28 Member States again intend to fulfil their reduction targets under the second commitment period jointly¹. The ratification decision (Council Decision (EU) 2015/1339) sets out the terms of the joint fulfilment between the European Union and its Member States and Iceland².

4.1 Calculation of the assigned amounts

The joint assigned amount is calculated pursuant to the quantified emission limitation and reduction commitment listed in the third column of the table contained in Annex B to the Kyoto Protocol and in accordance with the provisions of Article 3 thereof. The assigned amounts of the members are determined in accordance with the terms of the joint fulfilment.

The combined base year emissions of the members to the joint fulfilment equal the sum of emissions in the respective base years applicable to each Member State and Iceland.

If land-use, land-use change and forestry constituted a net source of greenhouse gas emissions in 1990 for any Member State or Iceland, that member shall, pursuant to Article 3(7bis) of the Kyoto Protocol, include in its emissions base year or period the aggregate anthropogenic carbon dioxide equivalent emissions by sources minus removals by sinks in the base year or period from land-use change (deforestation) for the purpose of calculating the joint assigned amount of the members determined in accordance with Article 3 (7bis), (8) and (8bis) of the Kyoto Protocol.

The calculation pursuant to Article 3(7ter) of the Kyoto Protocol shall apply to the joint assigned amount of the second commitment period determined in accordance with Article 3 (7bis), (8) and (8bis) of the Protocol and the sum of the average

¹ Declaration made in footnotes 4, 6 and 8 to Annex B of the Doha Amendment and Council Decisions (EU) 2015/1339 and 2015/1340

² For a more detailed description of the terms of Sweden's joint fulfilment with the European Union, see the European Union's Report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol.

annual emissions of the members for the first three years of the first commitment period multiplied by eight.

4.2 Emission levels allocated to the members of the joint fulfilment

The joint quantified emission limitation and reduction commitment for the members listed in the third column of Annex B of the Kyoto Protocol for the European Union, its 28 Member States and Iceland is 80%. The joint assigned amount is determined pursuant to Article 3(7bis), (8) and (8bis) of the Kyoto Protocol on the basis of the combined base year.

The respective emission levels of the members to the joint fulfilment are as follows:

- The emission level and assigned amount for the European Union is the difference between the joint assigned amount of the members, and the sum of the emission levels of the Member States and Iceland.
- The assigned amount of the European Union is counted against the emissions of greenhouse gases listed in Annex A to the Kyoto Protocol that are also covered by the EU Emissions Trading System (EU ETS) pursuant to Directive 2009/29/EC of the European Parliament and of the Council amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community. The sectors covered by the EU Emissions Trading System are those specified in Annex I of the EU ETS Directive and taking into account the application of its Articles 24 and 27.
- The emission levels of the Member States and Iceland cover the emissions from sectors and gases listed in Annex A to the Kyoto Protocol not covered by Directive 2009/29/EC of the European Parliament and of the Council, amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community. This includes all emissions from sources and removals by sinks covered by Article 3(3) and (4) of the Kyoto Protocol as well as all emissions of nitrogen trifluoride (NF₃). These emission levels are no longer derived as a reduction percentage compared to base year emissions as in the first commitment period, but as an absolute figure, expressed in tonnes of carbon dioxide equivalents listed for each Member State and Iceland. The figure for individual Member States is equal to the sum of each Member State's Annual Emissions Allocation under Decision No 406/2009/EC on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020 (Effort Sharing Decision) for the years 2013 to 2020 before the application of Article 3(7bis).

Emission levels of each Member state and Iceland set out in the terms of the joint fulfilment before application of Article 3(7bis) for the second commitment period under the Kyoto Protocol can be found in the annex to the European Union's Report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol, table 2 – 4.

The terms of the joint fulfilment determine that the assigned amounts of the Member States and Iceland shall be equal to their respective emission levels, adjusted for Article 3(7bis) of the Kyoto Protocol. This is done at EU level and described in detail in European Union's Report to facilitate the calculation of assigned amount for the second commitment period of the Kyoto Protocol.

The assessment of compliance of the joint fulfilment at the end of the second commitment period does not require changes to the annual inventory reporting. The European Union, Sweden and the rest of the 27 Member States and Iceland shall continue to report individually on emissions by sources and removals by sinks, submitting full greenhouse gas inventories covering all anthropogenic emissions by sources and removals by sinks for gases listed on Annex A to the Kyoto Protocol and all source categories covered by the UNFCCC reporting guidelines occurring on their territories under the Kyoto Protocol. Sweden will report annually in the national inventory reports on our verified emissions falling under the scope of the Emissions Trading System and the share of those emissions in total emissions, allowing for transparent annual monitoring of the respective emission levels.

5 Calculation of the assigned amounts

Calculation of the assigned amount pursuant to Article 3(7bis), (8) and (8bis).

5.1 Assigned amount for the EU

The combined base year emissions of the European Union, its Member States and Iceland are equal to the sum of the respective base year emissions of the 28 Member States and Iceland and can be found in European Union's Report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol.

Table 5.1 Base year emissions of the EU and Sweden, calculated pursuant to Article 3(7bis) in tonnes of CO₂-eq.

	Base year emissions	Net emissions in 1990 due to deforestation where LULUCF sector is a net source of emissions	Final base year emissions, after application of Art. 3(7bis)
Combined base year emissions for EU ³	-	-	-
Sweden	71 917 260	0	71 917 260

Pursuant to Article 3(7bis), (8) and (8bis) of the Kyoto Protocol and paragraph 2 of Annex I to document 3/CMP.11, the assigned amount for the second commitment period is equal to the percentage inscribed in the third column of Annex B of the Annex to the Doha amendment of the aggregate anthropogenic carbon dioxide equivalent emissions of greenhouse gases in the base year multiplied by eight, taking into account Article 3(7bis) of the Kyoto Protocol and paragraph 2 of the Annex to document 3/CMP.11. This method of calculation is applied to the calculation of the joint assigned amount only. It does not apply to the calculation of the individual assigned amounts for the European Union, the Member States individually, or Iceland. Thus, the calculations of the base year emissions do not play a role in the calculation of their individual assigned amounts, which are instead determined pursuant to the joint fulfilment agreement.

The respective assigned amounts of each Member State and Iceland are equal to the emission levels agreed under the terms of the joint fulfilment, listed in Annex 2 of the ratification decision (Council Decision (EU) 2015/1339), after the application of Article 3(7bis) of the Kyoto Protocol. The assigned amount of the European Union is the difference between the joint assigned amount and the sum

³ Due to the problem with CRF reporter, the EU figures were not available in time for the Swedish submission. For information about EU figures, see the European Union's Report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol.

of the assigned amounts of the Member States and Iceland. The assigned amount of the European Union shall be issued in the Kyoto registry of the European Union.

For the assessment of compliance with the joint fulfilment agreement at the end of the second commitment period, the total greenhouse gas emissions of the European Union, its Member States and Iceland from sources listed in Annex A to the Kyoto Protocol for the period 2013 to 2020 shall be compared to the total amount of Kyoto units retired in the Kyoto registries of the European Union, its Member States and Iceland.

For a complete explanation and explicit figures on the assigned amount of the European Union, its Member States and Iceland, see the European Union's Report to facilitate the calculation of the assigned amount for the second commitment period under the Kyoto Protocol.

5.2 Assigned amount for Sweden

The individual assigned amount for Sweden was established at 315 554 578 assigned amount units (AAUs), in accordance with the notification of the terms of the agreement to fulfil the commitment jointly by the European Union, its Member States, and Iceland (Council Decision (EU) 2015/1339). Sweden's assigned amount was defined as the sum of the annual emission allocations for the period 2013 – 2020 determined pursuant to Decision No 406/2009/EC. That amount, based on global warming potential values from the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, was determined under Annex II to Commission Decision 2013/162/EU and adjusted by Commission Implementing Decision 2013/634/EU.

Since Sweden's land-use change and forestry did not constitute a net source of greenhouse gases in 1990, no addition has been made in regards to that sector. Article 3.7bis of the Kyoto Protocol states that parties for whom land-use change and forestry constituted a net source of greenhouse gas emission in 1990 shall include in their 1990 emissions base year those equivalent emissions minus removals by sinks for the purpose of calculating its assigned amount.

6 Calculation of the commitment period reserve

Parties are required by Decision 11/CMP.1 under the Kyoto Protocol and paragraph 18 of Decision 1/CMP.8 to establish and maintain a commitment period reserve as part of their responsibility to manage and account for their assigned amount. The commitment period reserve equals the lower of either 90% of a Party's assigned amount pursuant to Article 3(7bis), (8) and (8bis), or 100% of its most recently reviewed inventory, multiplied by 8.

Table 6.1 Commitment period reserve of the European Union and Sweden in tonnes of CO₂-eq.

	Assigned amount for second commitment period multiplied by 8	90 % of assigned amount	100% of most recently reviewed inventory	Commitment period reserve
European Union ⁴	-	-	-	
Sweden	315 554 578	283 999 120	435 061 898	283 999 120

For the purposes of the joint fulfilment, the commitment period reserve applies to the EU, its Member States and Iceland individually, see Table 7.1 and the European Union's Report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol.

According to definition (i), the commitment reserve would amount to 90 per cent of Sweden's assigned amount, which is equal to 283 999 120 tonnes of CO₂-equivalents, see Table 6.1.

According to definition (ii), the commitment period reserve would amount to eight times the sum of the most recent greenhouse gas inventory, which is equal to 435 061 898 tonnes of CO₂-equivalents, see Table 6.1.

The commitment period reserve is therefore established in line with definition (i), amounting to 283 999 120 AAUs.

⁴ Due to the problem with CRF reporter, the EU figures were not available in time for the Swedish submission. For information about EU figures, see the European Union's Report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol.

6.1 Difference between the assigned amount for the second commitment period and the average emissions for the first three years of the preceding commitment period

According to Article 3(7ter) of the Doha Amendment of the Kyoto Protocol, any positive difference between the assigned amount of the second commitment period and the average annual emissions for the first three years of the preceding commitment period multiplied by eight shall be transferred to the cancellation account.

In line with the terms of the joint fulfilment of the European Union, its Member States and Iceland under Article 3 of the Kyoto Protocol, Article 3(7ter) is applied to the joint assigned amount of the second commitment period. A complete explanation and explicit figures on the assigned amount and the average emissions for the first three years of the preceding commitment period are provided in the European Union's Report to facilitate the calculation of the assigned amount for the second commitment period under the Kyoto Protocol.

6.2 Application of paragraphs 23 – 26 of decision 1/CMP.8

According to decision 1/CMP.8, paragraph 23, each Party included in Annex I with a commitment inscribed in the third column of Annex B as contained in annex I to this decision shall establish a previous period surplus reserve (PPSR) account in its national registry. Based on this provision, the European Union, Sweden and all other Member States and Iceland will establish previous period surplus reserve accounts in their respective registries.

According to decision 1/CMP.8, paragraph 24, where the emissions of a Party referred to in paragraph 23 above in a commitment period are less than its assigned amount under Article 3, the difference shall, on request of that Party, be carried over to the subsequent commitment period, as follows:

- a) Any ERUs or CERs held in that Party's national registry that have not been retired for that commitment period or cancelled may be carried over to the subsequent commitment period, up to a maximum for each unit type of 2.5 per cent of the assigned amount calculated pursuant to Article 3(7) and (8);
- b) Any AAUs held in that Party's national registry that have not been retired for that commitment period or cancelled shall be added to the assigned amount for that Party for the second commitment period. That part of a Party's assigned amount consisting of AAUs held in that Party's national registry that has not been retired for that commitment period or cancelled

shall be transferred to its previous period surplus reserve account for the subsequent commitment period, to be established in its national registry;

Based on this provision, the European Union, each Member State and Iceland will carry over any remaining ERUs, CERs or AAUs that have not been retired or cancelled for the first commitment period in their respective registries to their respective previous period surplus reserve accounts. The 2.5 per cent limit in paragraph 24 (a) of decision 1/CMP.8 will be calculated based on the assigned amounts of the Member States, Iceland and the European Union calculated pursuant to Article 3(7) and (8) for the first commitment period.

According to decision 1/CMP.8, paragraph 25, units in a Party's previous period surplus reserve account may be used for retirement during the additional period for fulfilling commitments of the second commitment period up to the extent by which emissions during the second commitment period exceed the assigned amount for that commitment period, as defined in Article 3(7 bis), (8) and (8 bis), of the Kyoto Protocol. This provision will be applied to the European Union, its Member States and Iceland individually due to the fact that the previous period surplus reserve accounts will be established in the Kyoto registries of the European Union, its Member States and Iceland. Units in a member's Previous Period Surplus Reserve account may be used for retirement during the additional period for fulfilling commitments of the second commitment period, up to the extent by which that member's emissions during the second commitment period exceed its respective assigned amount for that commitment period.

According to decision 1/CMP.8, paragraph 26, units may be transferred and acquired between previous period surplus reserve accounts. This provision will be applied to the European Union, its Member States and Iceland individually due to the fact that the previous period surplus reserve accounts will be established in the Kyoto registries of the European Union, its Member States and Iceland.

6.3 Application and calculation pursuant to paragraph 13 in the annex of decision 2/CMP.7

According to paragraph 13 in the annex of decision 2/CMP.7 for the second commitment period, additions to the assigned amount of a Party resulting from forest management under Article 3(4), and from forest management project activities undertaken under Article 6, shall not exceed 3.5 per cent of the base year greenhouse gas emissions excluding land use, land-use change and forestry pursuant to Article 3(7) and (8), or any amendments thereto, times the duration of the commitment period in years. Similar to the general accounting of emissions and removals under Article 3(3) and (4), Member States and Iceland will apply this provision individually. For the figure for EU as a whole see the EU report to

facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol and for the Swedish calculation see section 8 below.

8 Land use, land-use change and forestry

8.1 Definition of forest for reporting under Articles 3(3) and 3(4)

Sweden set the definition of forest already for the first commitment period. It is only repeated here for information purpose:

Forest land is defined, according to the FAO definition, as land with a tree crown cover (or equivalent stocking level) of more than 10 % and an area of more than 0.5 ha. The trees should be able to reach a minimum height of 5 m at maturity. Assessed land that meet the forest criteria above are not considered forest where other land-uses are predominating. Tree-rows narrower than 10 meters are not considered forest. Roads and power-line routes within forests are considered forest only if they are narrower than 5 metres.

8.2 Election of activities under Article 3(4)

Sweden will not elect additional activities under Article 3(4) for the second commitment period of the Kyoto Protocol.

8.3 Method for identification of land areas associated with LULUCF-activities

The national system, under Article 5(1), will identify land areas for all accounted LULUCF-activities within a geographic boundary, encompassing units of land or land subject to multiple activities under Articles 3(3) and 3(4) (Reporting Method 1) combined with a sample based grid system resulting from a stratification of the country (Approach 3).

To ensure continuous accounting of land that was accounted for under activities under Articles 3(3) and 3(4) in the first commitment period, the same system for reporting is applied also during the second commitment period.

8.4 Accounting period

Sweden intends to account for the entire commitment period for activities under Articles 3(3) and 3(4) at the end of the commitment period.

8.5 Application and calculation pursuant to paragraph 13 in the annex of decision 2/CMP.7

According to paragraph 13 in the annex of decision 2/CMP.7 for the second commitment period, additions to the assigned amount of a Party resulting from forest management under Article 3(4), and from forest management project activities undertaken under Article 6, shall not exceed 3.5 per cent of the base year greenhouse gas emissions excluding land use, land-use change and forestry pursuant to Article 3(7) and (8), or any amendments thereto, times the duration of the commitment period in years. The maximum accountable quantities resulting from forest management that can be added to the assigned amounts to Sweden are 20 149 238 ton CO₂-eq.

8.6 Forest management reference level

The forest management reference level (FMRL) for Sweden, inscribed in the Appendix to the Annex to Decision 2/CMP.7, is -41 336 thousand tonnes of CO₂-equivalents per year applying a first order decay function for harvested wood products.

The FMRL was based on averages of the projected emissions/removals for carbon pools and included sources for forest management data series for the period 2013-2020, taking into account policies implemented before mid-2009.

Emissions/removals from harvested wood products are estimated using the product categories, half-lives and methodologies, as suggested in paragraph 29 in the Annex to Decision 2/CMP.7. Emissions from harvested wood products originating from forests prior to the start of the second commitment period were included in the forest management reference level.

The full description of the forest management reference level calculations can be found in Sweden's submission of information on forest management reference levels.⁵

8.6.1 Technical correction

Sweden has performed an assessment on the need for a technical correction of the forest management reference level inscribed in the Appendix to the Annex to Decision 2/CMP.7.

Recalculations were made due to revised methods for calculation of emissions and removals for harvested wood products and due to extended datasets for historical carbon stock changes. Furthermore, historical data on other emissions (e.g. from drainage and biomass burning) were updated. A detailed description of the

⁵ http://unfccc.int/files/meetings/ad_hoc_working_groups/kp/application/pdf/awgkp_sweden_2011.pdf

calculation of the technical correction can be found in section 10.5.6 of the National Inventory Report 2016.

The forest management reference level was recalculated to -34.07 M ton CO₂-eq and the technical correction was estimated to -7.27 M ton CO₂-eq in Sweden's National Inventory Report 2016

8.7 Natural disturbances

Sweden intends to apply the provisions to exclude emissions from natural disturbances for the accounting of afforestation and reforestation under Article 3(3) and forest management under Article 3(4) during the second commitment period of the Kyoto Protocol.

8.7.1 Country-specific information on the background levels of emissions associated with annual natural disturbances that have been included in its forest management reference level

Emissions associated with wildfires and storms have been included in Sweden's forest management reference level. Wildfires have been included as the mean annual emissions for the years 2005-2009 and storms by the fact that the emissions are comprised in the estimates of carbon stock changes. This far, no other potential natural disturbance has been identified under Forest management.

8.7.2 Information on how the background levels have been estimated

This section includes information on how the background levels for afforestation and reforestation under Article 3(3) and forest management under Article 3(4) have been estimated, and information on how it avoids the expectation of net credits or net debits during the second commitment period of the Kyoto Protocol, including information on how a margin is established.

The background level for wildfires for the activity forest management has been estimated using historical information on natural disturbances according to 2.3.9.6 in the Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol⁶. Currently, no other potential natural disturbances that give rise to additional emissions qualifying for exclusion have occurred. Therefore, the background levels for all other possible disturbances have been set to zero. The effects of the storms are minimized by effective salvage logging keeping the additional emissions to a minimum

The background level for forest management has been estimated using historical information on natural disturbances (see Table 8.1). Currently, only data for wildfires deviates from zero and has repeatedly been recorded. The process to

⁶ IPCC (2013). Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol, Hiraishi, T., Krug, T., Tanabe, K., Srivastava, N., Baasansuren, J., Fukuda, M. and Troxler, T.G. (eds). Published: IPCC, Switzerland.

calculate the background level for wildfires on FM-land follows the default process described by the IPCC. The calculations are based on the reported emissions from wildfires for the years 1990-2013. The arithmetic mean and the corresponding standard deviation for the calibration period were calculated. Outliers, i.e. emissions greater than the arithmetic mean plus twice the standard deviation was removed in an iterative process until no further outliers were identified. The arithmetic average calculated in the last step defines the background level (Figure 8.1).

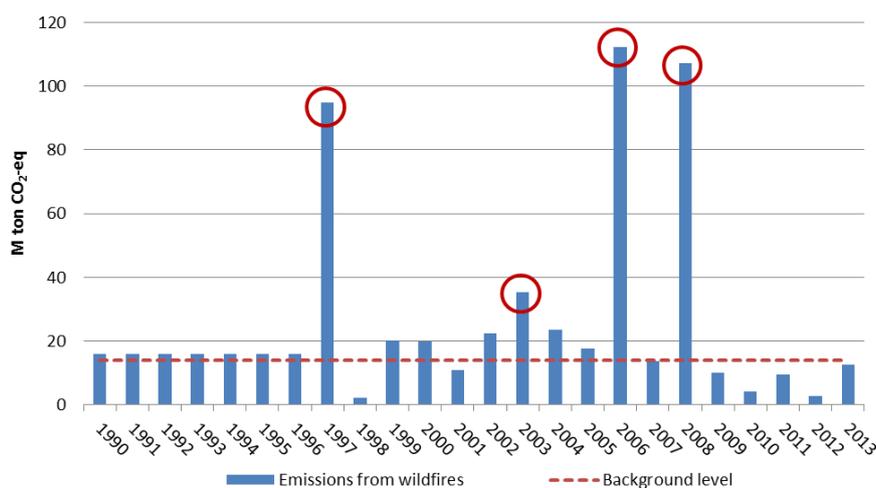


Figure 8.1: Background data on wildfires for forest management (blue bars), the background level (red, dashed line) and the excluded outliers (marked with red rings).

The established background levels avoid the expectation of net credits or net debits during the commitment period since:

- There are no observed trends in natural disturbance emissions during the calibration period (1990-2012) for forest management.
- The background level of emissions for forest management or afforestation and reforestation, included in the forest management reference level, or associated with afforestation and reforestation, respectively, is equal to the average of the annual emissions from observed natural disturbances during the calibration period and includes solely emissions from wildfires.

According to footnote 8, page 17, in Decision 2/CMP.7, a Party has to describe how a margin was established, if a margin is needed. To avoid identifying a natural disturbance as an artefact from uncertainty in estimates, Sweden has chosen to implement a margin in level with the uncertainty in estimates. The margin is based on the uncertainty in the changes of living biomass, which is considered the most important variable in this context. The estimations of the background level and the margin are consistent with afforestation, reforestation and forest management (footnote 9, page 18 in Decision 2/CMP.7).

For all potential natural disturbances on land where afforestation and/or reforestation (AR) may occur, a country specific margin has been established based on the estimated standard error of estimates of change in living biomass. Thus, the margin for AR is set to 0.3 million tonnes of CO₂-equivalents per year.

For all potential natural disturbances on land under forest management (FM), a country specific margin has been established based on the standard error of estimates of change in living biomass. Thus, the margin for FM is set to 3.0 million tonnes of CO₂-equivalents per year. Note that emissions from any potential natural disturbance event are estimated based on changes in all carbon pools and all other emissions – not only by changes in living biomass.

Table 8.1: Background level(s) and margin(s) for afforestation and reforestation and forest management

Activity and disturbance type	Background level kt CO ₂ eq	Margin kt CO ₂ eq
AR total	0	300
Wildfires	0	-
Insect attacks and disease infestations ¹	0	-
Extreme weather events ²	0	-
Geological disturbances ³	0	-
FM total	14.12	3000
Wildfires	14.12	-
Insect attacks and disease infestations ¹	0	-
Extreme weather events ²	0	-
Geological disturbances ³	0	-

¹Includes diseases (pathogens such as fungi, phytoplasma, or virus) and insect pests.

²Can involve droughts, floods, heavy and wet snowfall, avalanches, ice, and strong winds, occurring either as a single event or in combinations

³Can include volcanic eruptions, landslides, tsunamis, and earthquakes

9 National system

A description of the Swedish national system in accordance with Article 5, paragraph 1, of the Kyoto Protocol, reported in accordance with the “Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol”, was established for the first commitment period of the Kyoto Protocol. The original description of the national system, is available in the Initial Report for the first commitment period of the Kyoto Protocol, see Annex III. Subsequent updates to the national system is described in the 2016 National Inventory Report, see Annex I.

10 National registry

A description of the Swedish national registry, reported in accordance with the “Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol”, was established for the first commitment period of the Kyoto Protocol. The original description of the national registry is available in the Initial Report for the first commitment period of the Kyoto Protocol, see Annex III. Subsequent updates of the National Registry is described in the 2016 National Inventory Report, see Annex I.