PORTUGUESE ENVIRONMENT AGENCY

REPORT TO FACILITATE THE CALCULATION OF THE ASSIGNED AMOUNT OF PORTUGAL PURSUANT TO ARTICLE 3, PARAGRAPHS 7 BIS, 8 AND 8 BIS OF THE KYOTO PROTOCOL

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1. INTRODUCTION

This report constitutes the report to facilitate the calculation of the assigned amount of Portugal pursuant to Article 3, paragraphs 7bis, 8 and 8bis of the Kyoto Protocol for the second commitment period and to demonstrate the capacity to account for the emissions and assigned amount in accordance with decision 2/CMP.8 under the Kyoto Protocol period, also referred to as the 'initial report'.

The targets (quantified emission limitation commitments, QELRCs) for the Union and its Member States are listed in the Doha Amendment with a footnote stating that those targets are based on the understanding that they will be fulfilled jointly by the European Union and its Member States, in accordance with Article 4 of the Kyoto Protocol. The Union, its Member States at the time, Croatia[1] and Iceland also issued a joint declaration upon the adoption of the Doha Amendment, expressing their intention to fulfil their commitments in the second commitment period jointly.[2]

This report generally follows the structure and the requirements set out in Annex I to Decision 2/CMP.8. In addition, this report also reflects the additional guidance contained in decision 3/CMP.11. This decision contains relevant provisions related to reporting and accounting for the second commitment period under the Kyoto Protocol, including the specification of elements for this report.

As acknowledged by paragraphs 11 to 14 of Decision 13/CP.20 on "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" the CRF reporter for use in 2015 was not functioning properly and the Inventory Submissions of 2015 under the KP could not be delivered. For that reason this report could not be submitted on its expected deadline, i.e. in 2015.

This report is based on the latest information contained in the NIR and CRF tables provided by Portugal in its 2016 submission. This version contains the revisions considered necessary following the UNFCCC review of the version submitted on the 15th of June 2016.

2. COMPLETE GREENHOUSE GAS INVENTORY

Portugal's latest submission was submitted to the UNFCCC in the 22nd of December 2016. According to that submission, Portuguese emissions in 2014 were:

- 55.1 million t of CO_2eq. (total including LULUCF and excluding indirect emissions), 11.5% below 1990 levels.
- 55.2 million t of CO_2eq. (total including LULUCF and including indirect emissions), 11.5% below 1990 levels.
- 65.4 million t of CO_2eq. (total excluding LULUCF and excluding indirect emissions), 8.0% above 1990 levels.
- 65.5 million t of CO_2eq. (total excluding LULUCF and including indirect emissions), 8.0% above 1990 levels.

The evolution since 1990 of sectoral emissions is summarised in the figure below.

[1] Croatia only joined the EU on 1 July 2013, i.e. after the adoption of the Doha Amendment.

[2] FCCC/KP/CMP/2012/13/Add.1

Figure 1: Total and sectoral emissions in Portugal 1990-2014

The full detail of Portugal's complete GHG Inventory submission can be found at the UNFCCC website on the page for "National Inventory Submissions 2016" in the URL link below.

http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/9492.php

Table 1: Greenhouse gas emissions 1990-2001 (kt)

GREENHOUSE GAS EMISSIONS	Base year[1]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	CO_2 equivalent (kt)												
CO_2 emissions without net CO_2 from LULUCF	45959.04	45959.04	47588.57	51830.73	50451.84	51154.76	55162.96	52462.76	55521.14	60043.90	67734.98	66611.56	66232.80
CO_2 emissions with net CO_2 from LULUCF	46962.03	46962.03	48541.51	48196.53	45684.13	45649.97	49872.69	43476.60	45625.87	52306.17	58448.58	59973.42	56246.34
CH_4 emissions without CH_4 from LULUCF	10599.48	10599.48	10834.93	11025.00	11040.82	11493.16	11863.02	11866.52	12071.41	12531.48	12743.77	12639.44	12958.88
CH_4 emissions with CH_4 from LULUCF	10803.94	10803.94	11110.56	11112.82	11115.84	11613.09	12118.64	11963.47	12110.56	12736.52	12850.32	12824.27	13069.75
N_2O emissions without N_2O from LULUCF	3989.65	3989.65	3964.81	3941.08	3921.57	3966.30	4155.41	4382.94	4383.97	4354.33	4436.61	4409.53	4247.50
N_2O emissions with N_2O from LULUCF	4530.36	4530.36	4498.27	4424.86	4384.35	4424.29	4632.70	4831.29	4819.91	4814.54	4876.71	4858.51	4680.42
HFCs	NO,NA	NO,NA	NO,NA	NO,NA	NO,NA	NO,NA	35.42	59.05	100.88	146.23	211.77	281.22	365.11
PFCs	NO,NA	NO,NA	NO,NA	NO,NA	NO,NA	NO,NA	NO	NO	0.09	0.43	0.77	1.13	1.51
Unspecified mix of HFCs and PFCs	NO,NA	NO,NA	NO,NA	NO,NA	NO,NA	NO,NA	NO	NO	NO	NO	NO	NO	NO
SF_6	NO,NA	NO,NA	NO,NA	NO,NA	NO,NA	NO,NA	13.93	14.40	15.46	15.83	16.53	16.61	17.87
NF_3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total (without LULUCF)	60548.17	60548.17	62388.31	66796.82	65414.24	66614.22	71230.74	68785.67	72092.96	77092.20	85144.43	83959.49	83823.67
Total (with LULUCF)	62296.33	62296.33	64150.35	63734.21	61184.32	61687.35	66673.39	60344.81	62672.78	70019.72	76404.68	77955.17	74380.99
Total (without LULUCF, with indirect)	60701.98	60701.98	62531.41	66960.01	65573.01	66787.41	71397.05	68948.47	72262.74	77262.92	85317.16	84131.07	83962.37
Total (with LULUCF, with indirect)	62450.14	62450.14	64293.44	63897.40	61343.09	61860.54	66839.70	60507.61	62842.57	70190.44	76577.41	78126.74	74519.69

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year[1]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	CO_2 equivalent (kt)												
1. Energy	41516.97	41516.97	43134.08	47688.72	46404.43	47064.75	50620.62	47972.75	50612.23	55116.13	62520.94	60997.99	61470.96
2. Industrial processes and product use	6194.32	6194.32	6167.86	5868.55	5752.38	5795.65	6485.03	6529.94	7029.30	7210.23	7634.15	7897.44	7445.45
3. Agriculture	6806.45	6806.45	6855.89	6780.52	6636.38	6812.09	6954.30	7139.44	7053.56	7084.36	7241.63	7419.53	7203.91
4. Land use, land-use change and forestry[5]	1748.15	1748.15	1762.04	-3062.61	-4229.92	-4926.88	-4557.35	-8440.86	-9420.17	-7072.48	-8739.75	-6004.32	-9442.68
5. Waste	6030.44	6030.44	6230.49	6459.04	6621.06	6941.73	7170.78	7143.53	7397.86	7681.48	7747.70	7644.54	7703.35
6. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total (including LULUCF)[5]	62296.33	62296.33	64150.35	63734.21	61184.32	61687.35	66673.39	60344.81	62672.78	70019.72	76404.68	77955.17	74380.99

Table 2: Greenhouse gas emissions 2002-2014 (kt)

GREENHOUSE GAS EMISSIONS	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Change from base to latest reported year
														(%)
CO_2 emissions without net CO_2 from LULUCF	70037.32	64882.36	67651.82	70122.01	65421.02	62923.43	60631.26	57714.54	53298.81	51864.40	49977.64	48207.34	48054.46	4.56
CO_2 emissions with net CO_2 from LULUCF	60469.10	65198.86	58968.38	69416.33	55795.94	49825.85	46130.21	43275.59	41378.95	39930.68	40347.22	39202.04	37396.05	-20.37
CH_4 emissions without CH_4 from LULUCF	13270.32	13510.79	13521.27	13508.04	13004.41	12799.63	12553.90	12448.64	12108.02	12123.97	11798.73	11560.47	11374.16	7.31
CH_4 emissions with CH_4 from LULUCF	13442.20	14228.11	13659.96	14065.92	13107.20	12841.27	12575.06	12505.70	12259.73	12184.21	11970.17	11714.93	11390.30	5.43
N_2O emissions without N_2O from LULUCF	4301.61	3950.55	4117.79	3971.17	3832.75	4015.59	3889.92	3554.79	3557.75	3289.28	3288.15	3340.19	3409.62	-14.54
N_2O emissions with N_2O from LULUCF	4740.58	4474.99	4543.45	4453.38	4228.22	4380.25	4230.44	3902.00	3921.28	3638.44	3656.16	3706.02	3753.40	-17.15
HFCs	481.23	616.71	731.46	907.13	1088.25	1321.08	1569.49	1763.70	1910.10	2078.09	2216.48	2382.56	2534.82	100.00
PFCs	1.91	2.34	2.80	3.30	3.99	4.74	5.58	6.61	7.93	9.05	10.18	11.36	12.59	100.00
Unspecified mix of HFCs and PFCs	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
SF_6	18.16	21.64	26.54	26.63	28.44	31.38	30.36	33.14	34.69	30.24	33.38	35.00	30.65	100.00
NF_3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
Total (without LULUCF)	88110.55	82984.39	86051.68	88538.29	83378.87	81095.86	78680.50	75521.42	70917.31	69395.03	67324.57	65536.91	65416.29	8.04
Total (with LULUCF)	79153.19	84542.64	77932.59	88872.70	74252.04	68404.58	64541.13	61486.75	59512.68	57870.71	58233.59	57051.92	55117.80	-11.52
Total (without LULUCF, with indirect)	88238.71	83114.60	86188.78	88672.66	83511.74	81232.62	78815.72	75646.60	71048.89	69515.43	67447.14	65669.70	65544.10	7.98
Total (with LULUCF, with indirect)	79281.34	84672.85	78069.69	89007.07	74384.91	68541.34	64676.34	61611.93	59644.26	57991.11	58356.17	57184.71	55245.61	-11.54

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Change from base to latest reported year
														(%)
1. Energy	65182.86	60109.34	62099.26	64697.20	60015.47	56930.61	55292.86	54211.11	49117.60	48250.67	46730.14	44631.33	44213.92	6.50
2. Industrial processes and product use	7800.21	7859.46	8584.25	8601.42	8387.55	9250.33	9075.36	7376.16	7781.46	6953.16	6671.42	7124.99	7512.20	21.28
3. Agriculture	7099.69	6641.35	6830.21	6729.60	6622.21	6715.20	6691.41	6523.10	6442.76	6389.37	6429.93	6452.19	6616.76	-2.79
4. Land use, land-use change and forestry [5]	-8957.37	1558.25	-8119.10	334.40	-9126.83	-12691.28	-14139.38	-14034.67	-11404.62	-11524.32	-9090.98	-8484.99	-10298.49	-689.11
5. Waste	8027.79	8374.23	8537.95	8510.07	8353.63	8199.73	7620.88	7411.04	7575.48	7801.84	7493.09	7328.39	7073.40	17.29
6. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00
Total (including LULUCF)[5]	79153.19	84542.64	77932.59	88872.70	74252.04	68404.58	64541.13	61486.75	59512.68	57870.71	58233.59	57051.92	55117.80	-11.52

3. BASE YEAR FOR NITROGEN TRIFLUORIDE IN ACCORDANCE WITH ARTICLE 3, PARAGRAPH 8BIS OF THE KYOTO PROTOCOL

Portugal maintains its election of base year used in the first Commitment Period for HFC's, PFC's and SF_6 (1995) and, in accordance with Article 3, paragraph 8bis, of the Kyoto Protocol, selects 2000 as base year for NF_3, i.e., the values summarised in the table below.

Table 3: Base year selected for NF_3

Greenhouse Gas	Base year adopted by Portugal
NF_3 Nitrogen Trifluoride	**2000**

4. TERMS OF THE JOINT FULFILMENT UNDER ARTICLE 4 OF THE KYOTO PROTOCOL

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

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 jointly[3].

The terms of the agreement are set in the Council Decision (EU) 2015/1339 of 13 July 2015 on the conclusion, on behalf of the European Union, of the Doha Amendment to the Kyoto Protocol to the United Nations Framework Convention on Climate Change and the joint fulfilment and the Council Decision (EU) 2015/1340 of 13 July 2015 on the conclusion, on behalf of the European Union, of the Agreement between the European Union and its Member States, of the one part, and Iceland, of the other part, concerning Iceland's participation in the joint fulfilment of commitments of the European Union, its Member States and Iceland for the second commitment period of the Kyoto Protocol to the United Nations Framework Convention on Climate Change, both published on the Official Journal of the European Union, L 207, 4 August 2015[4].

This agreement has been transposed into National Portuguese Law through Decreto 20/2015 of 21 October 2015, published on the Diário da República, 1.ª série — N.º 206 — 21 de outubro de 2015[5].

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.

If 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, paragraph 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, paragraphs 7bis, 8 and 8bis of the Kyoto Protocol.

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

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

[4] The complete versions of Council Decision (EU) 2015/1339 and Council Decision (EU) 2015/1340 can be found at the following URL: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2015:207:FULL&from=EN

[5] The complete version of Decreto 20/2015 can be found at the following URL: https://dre.pt/application/file/70762304

8bis of the Protocol and the sum of the average annual emissions of the members for the first three years of the first commitment period multiplied by eight.

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 of the Members is determined pursuant to Article 3, paragraph 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[6] 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, paragraphs 3 and 4 of the Protocol as well as all emissions of nitrogen trifluoride (NF_3) under the Kyoto Protocol. 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, paragraph 7bis.[7] The respective emission levels of the 28 Member States and Iceland in accordance with Article 4, paragraphs 1 and 5 of the Protocol and before application of Article 3, paragraph 7bis are listed in the Annex to Council Decision (EU) 2015/1339.

The terms of the joint fulfilment determine that the assigned amounts of the members shall be equal to their respective emission levels, adjusted for Article 3, paragraph 7bis 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, the 28 Member States and Iceland will 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.

[6] OJ L140, 5.6.2009, p. 63

[7] OJ L140, 5.6.2009, p. 136

5. CALCULATION OF THE ASSIGNED AMOUNT PURSUANT TO ARTICLE 3, PARAGRAPH 7BIS, 8 AND 8BIS OF THE KYOTO PROTOCOL

As described in footnote 4 of Annex B to the Kyoto Protocol, the quantified emission limitation and reduction commitment (QELRC) for the European Union and its member States for a second commitment period under the Kyoto Protocol are based on the understanding that these will be fulfilled jointly With the European union and its member States, in accordance with Article 4 of the Kyoto Protocol. The QELRCs are without prejudice to the subsequent notification by the European Union and its member States of an agreement to fulfil their commitments jointly in accordance with the provisions of the Kyoto Protocol.

As described in section 4, the responsibilities for complying with the European Union's reduction target are divided between Member States (individual MS responsibility) and the European Union (collective responsibility).

As indicated previously, the assigned amounts of the members are determined in accordance with the terms of the joint fulfilment. 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 (Effort Sharing Decision) for the years 2013 to 2020 before the application of Article 3, paragraph 7bis. For Portugal this figure is equal to 402,210,711 tonnes of CO_2 equivalent.

As land-use change and forestry constituted a net source of greenhouse gas emissions in 1990 for Portugal (1 002 985,35 tonnes CO_2 equivalent), under the terms of the joint fulfilment the assigned amounts of Portugal shall be equal to its respective emission levels (402,210,711 tonnes of CO_2 equivalent), adjusted for Article 3, paragraph 7bis of the Kyoto Protocol.

Table 4: Net emissions in 1990 due to deforestation where LULUCF sector is a net source of emissions

Emission Component	Reference	Value (tCO_2 eq.)
4.B.2.1 Forest Land to Cropland	GHG inventory submitted in 2016 (CRF Table 4.B)	**1 020 898**
4.C.2.1 Forest Land to Grassland	GHG inventory submitted in 2016 (CRF Table 4.C)	**1 897 922**
4.D.2.2.1 Forest Land to Flooded Land	GHG inventory submitted in 2016 (CRF Table 4.D)	**NO**
4.E.2.1 Forest Land to Settlements	GHG inventory submitted in 2016 (CRF Table 4.E)	**7 473**
4.F.2.1 Forest Land to Other Land	GHG inventory submitted in 2016 (CRF Table 4.F)	**1 244 385**
4.(I) N inputs to soil	GHG inventory submitted in 2016 (CRF Table 4.(I))	**IE**
4.(II) Drainage and Rewetting	GHG inventory submitted in 2016 (CRF Table 4.(II))	**NO**
4.(III) Direct N2O from SOM Loss	GHG inventory submitted in 2016 (CRF Table 4.(III))	(356 x 298) **106 081**
4.(IV) Indirect N2O	GHG inventory submitted in 2016 (CRF Table 4.(IV))	**IE**
4.(V) Biomass Burning Emissions	GHG inventory submitted in 2016 (CRF Table 4.(V))	**NE**[8]
TOTAL Deforestation Emissions in 1990		**4 276 759**
Total 3.(7bis) Emissions	Deforestation emissions x 8 years x 80%	**27 371 258**

Note: All figures were rounded to tonnes in the calculation of base year emissions.

[8] Estimates from fire emission are only available at the aggregated level of "land converted to…" and not "*forest* land converted to…"

The table below summarises the responsibilities of Portugal and calculates the respective Assigned Amount.

Table 5: Calculation of Portugal's Assigned Amount

Emission Component	Reference	Value (tCO_2 eq.)
1. Emissions covered by the Effort Sharing Decision	Table 1 of Annex 1 to the Council Decision (EU) 2015/1339	**402 210 711**
2. 1990 LUC Emissions x 8 x 80% **KP Article 3, paragraph 7bis**	GHG inventory submitted in 2016 (see Table 4)	**27 371 258**
3. TOTAL = Portugal's Assigned Amount	Sum of rows 3. and 4. above	**429 581 969**

Note: All figures were rounded to tonnes in the calculation of base year emissions.

Thus, Portugal's assigned amount pursuant to Article 3, paragraphs 7bis, 8 and 8bis of the Kyoto Protocol and the joint fulfilment agreement is equal to 429 581 969 tonnes CO_2 equivalent. As was the case for the first commitment period, the joint assigned amount units will not be issued separately but instead the assigned amounts of each member of the joint fulfilment agreement and the assigned amount of the European Union are recorded in the compilation and accounting database and the EU and each of the Member States and Iceland can issue their respective assigned amount units in their respective registries.

6. CALCULATION OF THE COMMITMENT PERIOD RESERVE FOR PORTUGAL IN ACCORDANCE WITH DECISION 11/CMP.1 UNDER THE KYOTO PROTOCOL

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, paragraphs 7bis, 8 and 8bis or 100% of its most recently reviewed inventory, multiplied by 8.

For the purposes of the joint fulfilment, the commitment period reserve applies to the EU, its Member States and Iceland individually.

Table 6: Calculation of Portugal's Second Commitment Period Reserve

Emission Component	Reference	Value (tCO_2 eq.)
1.a Assigned Amount	Table 2, row 5	**429,581,969.01**
2.a Commitment Period Reserve Assigned amount criterion	Paragraph 6 of Decision 11/CMP.1 (90% of Assigned Amount)	**386,623,772.11**
1.b 2014 total emissions without LULUCF and including indirect emissions	GHG inventory submitted in 2016 (CRF Table 10.s1)	**65,544,101.28**
2.b Commitment Period Reserve Latest Reviewed Report criterion	Paragraph 6 of Decision 11/CMP.1 (100% 2014 emissions w/o LULUCF x 8) GHG inventory submitted in 2016 (CRF Table 10.s1)	**524,352,810.23**
Commitment Period Reserve	Lowest of 2.a and 2.b	**386,623,772.11**

Note: All figures were rounded to tonnes in the calculation of base year emissions.

Thus, Portugal's commitment period reserve in accordance with decision 11/CMP.1 under the Kyoto Protocol equals 386 623 772 tonnes CO_2 equivalent.

7. CALCULATION PURSUANT TO ARTICLE 3, PARAGRAPH 7 OF THE KYOTO PROTOCOL

According to Article 3, paragraph 7ter 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, paragraph 7ter is applied to the joint assigned amount of the second commitment period.

8. 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, each Member State 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, paragraphs 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 of 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, paragraphs 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, paragraphs 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.

9. 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, paragraph 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, paragraphs 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, paragraphs 3 and 4, Member States and Iceland will apply this provision individually.

Given that Portugal's base year greenhouse gas emission excluding land-use, land-use change and forestry is 60 552 013 tonnes CO_2 equivalent, the maximum accountable quantities resulting from forest management that can be added to the assigned amount to Portugal is thus 16 954 564tonnes CO2 equivalent.

10. FOREST DEFINITION

Portugal maintains its forest definition used in the first commitment period, i.e., the values summarised in the table below.

Table 7: Criteria for Forest Definition selected by Portugal

Criteria	Admissible range	Values adopted by Portugal
Minimum tree crown cover	**10-30%**	**10%**
Minimum land area	**0.5-1ha**	**1ha**
Minimum tree height	**2-5m**	**5m**
Minimum width[9]	*n.a.*	*20m*

11. IDENTIFICATION OF ELECTED ACTIVITIES UNDER ARTICLE 3, PARAGRAPH 4 OF THE KYOTO PROTOCOL

Portugal will continue to report and account for all activities under Articles 3, paragraphs 3 and 4 used for compliance in the first Commitment Period, i.e., Portugal will report and account the activities summarised in the table below.

[9] Specifying a minimum width is not a formal requirement from the KP, but is it considered good practice by the 2006 IPCC Guidelines.

Table 8: LULUCF activities accounted by Portugal

Activity	KP Article and Status	Status in Portugal
Afforestation and reforestation	**3.3. Mandatory**	**Mandatory** **Accounted in the 2nd CP**
Deforestation	**3.3. Mandatory**	**Mandatory** **Accounted in the 2nd CP**
Forest Management	**3.4. Mandatory**	**Mandatory** **Accounted in the 2nd CP**
Cropland Management	**3.4. Eligible**	**Elected in the 1st CP** **Accounted in the 2nd CP**
Grassland Management	**3.4. Eligible**	**Elected in the 1st CP** **Accounted in the 2nd CP**
Revegetation	*3.4. Eligible*	*Not-elected in the 1st CP* *Not-elected in the 2nd CP*
Wetland drainage and rewetting	*3.4. Eligible*	*Not-elected in the 2nd CP*

12. ACCOUNTING PERIOD FOR LULUCF

Portugal will continue to account for all activities under Articles 3, paragraphs 3 and 4 in the same manner that was used for compliance in the first commitment period, i.e., Portugal will account for LULUCF only at the end of the entire commitment period.

13. FOREST MANAGEMENT REFERENCE LEVEL

The Forest Management Reference Level, as submitted in 18th of April 2011, and recorded in Appendix 1 to the Annex of Decision 2/CMP.7, was as shown in the table below:

Table 9: Forest Management Reference Level

	Including HWP as Instant Oxidation	Including HWP as First Order Decay
3.4 Forest Management Reference Level	**-6480**	**-6830**

Unit: 1000ton$CO_{2eq.}$

However, Portugal has since performed some technical corrections on its Forest Management Reference Level, which were made in response and in line with §15 of the Annex to Decision 2/CMP.7[10] and §1(i) of the Annex to Decision 2/CMP.8[11].

[10] §15. After adoption of the reference level for forest management, if the reported data on forest management or forest land remaining forest land used to establish the reference level are subject to recalculations, a technical correction shall be applied to include in the accounting the impact of the recalculations on the reported data that have been used by the Party to set the reference level.

[11] §1(i). The forest management reference level as inscribed in the appendix to the annex to decision 2/CMP.7, any technical corrections as contained in the inventory report for the first year of the second commitment period and references to those sections in the national inventory report where such information is reported consistent with the requirements of decision 2/CMP.7, annex, paragraph 14.

These technical corrections ensure methodological consistency between the current methodologies for estimating emissions and removals in the LULUCF Sector with the data reported in 2015 (relative to 1990-2013)

The revised version of the FMRL incorporates all data and methodological changes made to the inventory since 2011, as well as the use of the default method for estimating the contribution of Natural Disturbances to the FMRL in replacement of the method used in the original FMRL submission. Section 11.4.5 "Demonstration of Methodological Consistency between the FMRL and Accounting for Article 3, paragraph 4 FM and Technical Corrections on the FMRL" of the National Inventory Report of 2016 describes the main data and methodology changes that what introduced since the FMRL was recorded in Decision 2/CMP.7.

The National Inventory Report is available at:

http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/9492.php

Table 10 summarises the main changes in key drivers of the FMRL.

Table 10: Summary of the Changes in the Main Drivers for the Calculation of the FMRL

Table 11.3: Main differences in the original and recalculated values of the drivers of the FMRL

Forest Management Reference Level Changes in Main Drivers of Emissions and Removals (1)	Original Value (2)	Recalculated Value	unit
FM Forest Area	**3 700**	**3 725**	**1.000 ha**
Pinus pinaster	920	945	1.000 ha
Quercus suber	837	830	1.000 ha
Eucalyptus spp.	981	737	1.000 ha
Quercus rotundifolia	410	561	1.000 ha
Quercus spp.	202	189	1.000 ha
Other broadleaves	98	270	1.000 ha
Pinus pinea	227	142	1.000 ha
Other coniferous	26	12	1.000 ha
FM Forest Harvesting	**11 168**	**11 909**	**1.000 m^3 ub**
Pinus pinaster	3 435	3 462	1.000 m^3 ub
Quercus suber	65	147	1.000 m^3 ub
Eucalyptus spp.	7 034	7 157	1.000 m^3 ub
Quercus rotundifolia	48	92	1.000 m^3 ub
Quercus spp.	148	253	1.000 m^3 ub
Other broadleaves	77	297	1.000 m^3 ub
Pinus pinea	325	448	1.000 m^3 ub
Other coniferous	36	53	1.000 m^3 ub
FM Annual Burnt Area	**46 836**	**35 533**	**ha**
Pinus pinaster	14 899	16 676	ha
Quercus suber	3 222	2 906	ha
Eucalyptus spp.	18 923	9 511	ha
Quercus rotundifolia	1 204	992	ha
Quercus spp.	5 388	1 527	ha
Other broadleaves	1 811	2 395	ha
Pinus pinea	854	403	ha
Other coniferous	535	1 122	ha
FM HWP Production from Domestic Wood			
Industrial Roundwood	NA	10 613	1.000 m^3
Wood Pulp	2 038	1 943	1.000 ton
Wood Panels	1 329	1 255	1.000 m^3
Sawnwood	1 010	963	1.000 m^3
Paper and Paper Board	NA	1 424	1.000 ton
GWP	**AR2**	**AR4**	
CO_2	1	1	Gg CO_2 eq. / Gg CO_2
CH_4	21	25	Gg CO_2 eq. / Gg CH_4
N_2O	310	298	Gg CO_2 eq. / Gg N_2O

(1) Numerical values reported in this table represent the annual average for the period 2013-2020

(2) As cointained in the "Submission of Information on Forest Management Reference Level by Portugal" dated 24 th February 2011

Table 11: Revised Forest Management Reference Level and Technical Correction Factor for 2015

Table 11.4: Impact of recalculations, methodology changes and time series changes on the FMRL of Portugal

Forest Management Reference Level Changes in Reported Emissions and Removals (1)	Original Value (2)	Recalculated Value	Technical Correction	unit
Forest Management Reference Level	**-6 826,9**	**-3 393,1**	**3 433,8**	**Gg CO_2 eq.**
4(KP-I) Gains Above Ground Biomass	-6 529,6	-6 053,8		GgC
4(KP-I) Gains Below Ground Biomass	-1 315,5	-1 255,1		GgC
4(KP-I) Losses Above Ground Biomass	3 747,3	4 976,0		GgC
4(KP-I) Losses Below Ground Biomass	757,9	978,3		GgC
4(KP-I) Net-changes in Litter	34,9	10,0		GgC
4(KP-I) Net-changes in Dead Wood	IE	IE		GgC
4(KP-I) Net-changes in Soils	1 168,0	19,3		GgC
4(KP-I) Net-changes in HWP	-94,9	101,0		GgC
4(KP-II 3) N2O emissions from loss of SOM	NE	20,6		Gg CO_2 eq.
4(KP-II 4) Forest Fire Emissions (Natural Disturbances Background Level)	1 356,8	1 075,3		Gg CO2 eq.

(1) Numerical values reported in this table represent the annual average for the period 2013-2020

(2) As contained in the "Submission of Information on Forest Management Reference Level by Portugal" dated 24 th February 2011

Table 12: Forest Management Reference Level Technical Correction

	Original value	Technical Correction
3.4 Forest Management Reference Level Technical Correction	**-6830**	**3434**

Unit: 1000ton$CO_{2eq.}$

14. HARVESTED WOOD PRODUCTS

The activity data, emission factors and methodology used are described in section 6.8 "Harvested Wood Products (CRF 4.G)" and section 11.1.8 "Information on Harvested Wood Products" of the National Inventory Report of 2016.

All products produced since 1990 have been included in the estimates for HWP for use under the KP. The methodologies, activity data and emission factors for HWP in the FMRL and the actual reporting are the same. This guarantees a neutral impact on accounting, since Portugal is using a projected FMRL.

The National Inventory Report is available at:

http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/9492.php

15. NATURAL DISTURBANCES

Portugal intends to apply the provisions to exclude emissions from natural disturbances for both the accounting for afforestation and reforestation under Article 3, paragraph 3, of the Kyoto Protocol and the accounting for forest management under Article 3, paragraph 4, of the Kyoto Protocol during the second commitment period, in accordance with the provisions laid out in Decision 2/CMP.7.

Following the adoption of Decision 2/CMP.7, Portugal revised the contribution of Natural Disturbances included in the Forest Management Reference Level[12], so as to apply the method described in footnotes 7 (background level) and 8 (margin) of paragraph 33(a) and footnote 9 of paragraph 33(b) of Decision 2/CMP.7. The application of this methodology avoids the expectation of net credits or net debits during the commitment period.

Portugal's Background Level and Margin of Natural Disturbances for Article 3, paragraph 3 Afforestation and Reforestation and Article 3, paragraph 4 Forest Management, calculated using the referred methodology, are presented in Table 13.

Table 13: Portugal's Background Level and Margin of Natural Disturbances for Article 3, paragraph 3 Afforestation and Reforestation and Article 3, paragraph 4 Forest Management

Activity	Background Level	Margin
3.3 Afforestation and Reforestation (1)	**29,99**	**9,41**
3.4 Forest Management (2)	**1 075,27**	**1 188,95**

(1) Unit: ton$CO_{2eq.}$ / ha

(2) Unit: 1000ton$CO_{2eq.}$

The step-by-step calculations of the Background Level and Margin are illustrated in Table 14 (for Article 3, paragraph 3, AR) and Table 15 (for Article 3, paragraph 4, FM) below.

Table 14: Calculation of the Background Level and Margin of Natural Disturbances for Article 3, paragraph 3 Afforestation and Reforestation

3.3 AR Background Level	GgCO2eq.	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Reported emissions	GgCO2eq./1000ha	23	24	24	23	24	25	29	28	31	32	34	33	34	30	28	36	33	36	36	36
1st iteraction	GgCO2eq./1000ha	23	24	24	23	24	25	29	28	31	32	34	33	34	30	28	36	33	36	36	36
Used for calculation of 3.3 AR Background Level	**GgCO2eq./1000ha**	**23**	**24**	**24**	**23**	**24**	**25**	**29**	**28**	**31**	**32**	**34**	**33**	**34**	**30**	**28**	**36**	**33**	**36**	**36**	**36**

3.3 AR Background Level	Average	Stand. Dev.	Average+2xStDev
Reported emissions	30,0	4,7	39,4
1st iteraction	30,0	4,7	39,4

3.3 AR Background Level	**GgCO2eq./1000ha**	**29,99**
3.3 AR Margin	**GgCO2eq./1000ha**	**9,41**

Table 15: Calculation of the Background Level and Margin of Natural Disturbances for Article 3, paragraph 4 Forest Management

3.4 FM Background Level	GgCO2eq.	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Reported emissions	GgCO2eq.	2 213	2 931	924	784	1 241	2 632	976	410	2 079	1 082	1 726	1 134	1 703	6 829	1 166	5 694	912	277	163	412
1st iteraction	GgCO2eq.	2 213	2 931	924	784	1 241	2 632	976	410	2 079	1 082	1 726	1 134	1 703		1 166		912	277	163	412
2nd iteraction	GgCO2eq.	2 213		924	784	1 241	2 632	976	410	2 079	1 082	1 726	1 134	1 703		1 166		912	277	163	412
3rd iteraction	GgCO2eq.	2 213		924	784	1 241		976	410	2 079	1 082	1 726	1 134	1 703		1 166		912	277	163	412
4th iteraction	GgCO2eq.	2 213		924	784	1 241		976	410	2 079	1 082	1 726	1 134	1 703		1 166		912	277	163	412
Used for calculation of 3.4 FM Background Level	**GgCO2eq.**	**2 213**		**924**	**784**	**1 241**		**976**	**410**	**2 079**	**1 082**	**1 726**	**1 134**	**1 703**		**1 166**		**912**	**277**	**163**	**412**

3.4 FM Background Level	Average	Stand. Dev.	Average+2xStDev
Reported emissions	1 764	1 680	5 125
1st iteraction	1 265	777	2 819
2nd iteraction	1 167	683	2 533
3rd iteraction	1 075	594	2 264
4th iteraction	1 075	594	2 264
Used for calculation of 3.4 FM Background Level	**1 075**	**594**	**2 264**

3.4 FM Background Level	**GgCO2eq.**	**1 075,27**
3.4 FM Margin	**GgCO2eq.**	**1 188,95**

[12] This is also included as part of the "Technical Corrections" to the FMRL, as described in section 9 "Forest Management Reference Level". The original submission of the FMRL was made prior to the adoption of Decision 2/CMP.7 and used a different approach for the contribution of Natural Disturbances (average of the FM fire emissions for the period 1990-2009, excluding the 2 highest and 2 lowest years).

16. DESCRIPTION OF THE NATIONAL SYSTEM

This section does not apply to Portugal as it had a quantified emission limitation and reduction target in the first commitment period.

However, a description of our National System, in accordance with Article 5, paragraph 1, of the Kyoto Protocol, can be found at section 1 "Introduction" of the latest National Inventory Report.

The National Inventory Report is available at:

http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/9492.php

17. DESCRIPTION OF THE NATIONAL REGISTRY

This section does not apply to Portugal as it had a quantified emission limitation and reduction target in the first commitment period.

However, a description of our National Registry, in accordance with the "Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol, can be found at section 1 "Introduction" our latest National Inventory Report.

The National Inventory Report is available at:

http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/9492.php

ANNEX 1: JOINT FULFILMENT AGREEMENT

Council Decision (EU) 2015/1339 and Council Decision (EU) 2015/1340 can be found in the following URL link:

http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2015:207:FULL&from=EN

ANNEX 2: FOREST MANAGEMENT REFERENCE LEVEL SUBMISSION BY PORTUGAL

Portugal's Forest Management Reference Level as submitted in 18th of April 2011 can be found at the UNFCCC's website in the following URL link:

http://unfccc.int/files/meetings/ad_hoc_working_groups/kp/application/pdf/awgkp_portugal_fmrl_2011.pdf

ANNEX 3: REPORT OF THE TECHNICAL ASSESSMENT OF THE FOREST MANAGEMENT REFERENCE LEVEL SUBMISSION BY PORTUGAL

Portugal's Technical Assessment of the Forest Management Reference Level as submitted in 1st of October 2011 can be found at the UNFCCC's website in the following URL link:

http://unfccc.int/resource/docs/2011/tar/prt01.pdf