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Swedish Presidency
of the European Union

INFORMAL SUBMISSION BY SWEDEN ON BEHALF OF THE EUROPEAN COMMUNITY AND ITS MEMBER STATES ON FOREST DATA

Barcelona, 3 November 2009

The EU aims at providing the best available forest data to support the decision making process on forest management accounting rules. The EU believes that transparent data are needed to support the negotiating process, and looks forward to data submissions by other Parties.

This submission is essentially an update of the submission made in the climate talks in Bangkok. In comparison to that earlier version, this submission maintains the same table format, but includes updates, revisions of information and, when available, new estimates for previously missing data. It is the EU's intention to keep this document alive and, if justified, new revisions/updates of this submission will be provided.

The basis for this submission continues to be the data contained in international databases, disaggregated by Member State and, when sufficient data are available, aggregated to the EU-27 level. **When more detailed, updated or revised national information and projections exist, these have been used**. An Annex at the end of this submission provides more details on the data brought forward by each Member State. Additional data may be provided subsequently by Member States, depending on the availability and needs arising from the development of the negotiations.

Forest Area

The data presented below reproduce forest areas reported directly by EU Member States or the data contained in UNFCCC in Table 5.A "Total Forest Land" in their most recent submission (2009).

In some cases, Member states are now able to present more recent revisions of data, and these have been included in the table and replace UNFCCC data. Those cases are identified in the column “source” where instead of “UNFCCC” you will find “nat.data”. Further details on the new data provided in the table are shortly described in an Annex on country specific notes.

Forest area projections are not, at this point in time, available for all Member States. However, the table includes those estimates whenever available.

Forest areas in the EU-27 covered about 153Mha in 2007. This area has been increasing at an average yearly rate of about 383.000 ha/year (+0.3%/year), although the rate of increase has been declining.

Member	Historical forest area [1.000 ha]																		Annual change			Projections		
MS	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	1.000 ha/a	%/a	Source	2015	2020	Source
Austria	3 600,7	3 579,9	3 602,9	3 626,2	3 630,6	3 565,9	3 564,7	3 563,0	3 560,7	3 564,5	3 568,0	3 571,3	3 574,4	3 577,2	3 583,2	3 589,1	3 594,9	3 600,7	-0,8	0,0%	UNFCCC Subm 2009			
Belgium	641,1	639,3	637,5	635,7	633,9	632,1	628,4	626,6	624,8	624,2	621,0	621,0	621,0	621,0	621,0	621,0	621,0	621,0	-1,3	-0,2%	UNFCCC Subm 2009			
Bulgaria	3 329,5	3 332,4	3 329,0	3 329,0	3 354,0	3 357,0	3 355,0	3 352,0	3 899,7	3 370,1	3 398,3	3 466,2	3 488,9	3 547,5	4 063,6	4 076,5	4 076,5	4 108,5	46,5	1,4%	UNFCCC Subm 2009			
Cyprus	161,0										173,0					174,0			0,9	0,6%	FAO			
Czech Republic	2 576,9	2 576,7	2 576,5	2 576,1	2 576,9	2 577,5	2 578,4	2 579,2	2 581,1	2 581,8	2 584,5	2 586,1	2 590,2	2 591,3	2 592,8	2 594,5	2 596,2	2 598,2	1,4	0,1%	UNFCCC Subm 2009			
Denmark	555,0	557,3	559,5	561,7	563,9	566,1	567,7	570,2	572,5	574,7	576,9	580,7	584,5	586,5	590,6	592,5	598,3	602,1	2,7	0,5%	nat.data	616,4	625,9	nat.data
Estonia	2 163,0	2 171,0	2 179,0	2 187,0	2 195,0	2 203,0	2 211,0	2 219,0	2 227,0	2 235,0	2 243,0	2 251,2	2 259,4	2 267,6	2 275,8	2 284,0	2 251,9	2 212,7	5,9	0,3%	UNFCCC Subm 2009			
Finland	21 770,2	21 828,4	21 886,6	21 944,8	22 003,0	22 061,2	22 119,5	22 181,3	22 243,3	22 312,4	22 374,2	22 420,9	22 445,9	22 438,2	22 338,5	22 238,7	22 138,9	22 039,2	27,8	0,1%	UNFCCC Subm 2009			
France	15 259,0	15 185,0	15 356,1	15 540,2	15 653,4	15 739,9	15 802,2	15 836,6	15 880,9	15 824,5	15 884,1	15 943,7	16 003,3	16 062,9	16 122,5	16 184,1	16 248,2	16 314,9	59,2	0,4%	UNFCCC Subm 2009			
Germany	10 502,9	10 506,5	10 510,1	10 531,2	10 552,2	10 573,3	10 594,4	10 615,4	10 636,5	10 657,6	10 678,6	10 699,7	10 720,7	10 741,8	10 763,2	10 777,4	10 798,9	10 823,3	20,0	0,2%	UNFCCC Subm 2009			
Greece	6 513,1	6 513,1	6 513,1	6 513,1	6 515,5	6 518,7	6 521,7	6 527,7	6 529,5	6 533,5	6 535,9	6 548,9	6 551,2	6 553,7	6 556,1	6 558,7	6 560,9	6 563,2	3,5	0,1%	UNFCCC Subm 2009			
Hungary	1 574,0	1 584,0	1 591,7	1 602,1	1 612,1	1 625,2	1 637,4	1 651,4	1 663,7	1 679,7	1 672,7	1 703,3	1 714,6	1 740,3	1 770,3	1 789,6	1 805,8	1 826,0	14,7	0,9%	UNFCCC Subm 2009			
Ireland	481,7	501,0	517,1	534,9	552,4	575,6	596,6	608,2	621,4	634,1	649,5	665,0	681,1	689,9	700,3	711,5	719,6	727,5	14,7	3,1%	UNFCCC NIR	**790,4**	**830,4**	**nat.data**
Italy	**7 552,7**	**7 630,0**	**7 707,3**	**7 784,7**	**7 862,0**	**7 939,3**	**8 016,6**	**8 093,9**	**8 171,2**	**8 248,5**	**8 325,8**	**8 403,1**	**8 480,4**	**8 557,7**	**8 635,0**	**8 712,4**	**8 789,7**	**8 790,0**	**76,0**	**1,0%**	**nat.data**			
Latvia	3 371,0	3 375,0	3 380,8	3 388,8	3 386,8	3 422,1	3 423,5	3 413,3	3 388,2	3 382,3	3 379,8	3 378,5	3 391,9	3 368,6	3 400,2	3 421,9	3 421,9	3 391,1	1,0	0,0%	UNFCCC Subm 2009			
Lithuania	1 854,2	1 858,7	1 863,2	1 867,7	1 872,1	1 876,6	1 881,1	1 888,0	1 901,2	1 914,5	1 927,7	1 938,2	1 951,0	1 967,7	1 987,7	2 014,0	2 030,0	2 040,0	11,2	0,6%	UNFCCC Subm 2009			
Luxembourg	88,7	89,0	89,3	89,5	89,8	90,1	90,4	90,7	91,0	91,3	91,6	91,9	92,2	92,5	92,7	93,0	93,3	93,6	0,3	0,3%	UNFCCC Subm 2009			
Malta																								
Netherlands	383,6	384,2	384,9	386,2	385,6	386,9	387,6	388,2	388,9	389,6	390,2	390,9	391,6	392,3	392,9	393,6	394,3	394,9	0,7	0,2%	UNFCCC Subm 2009			
Poland	8 680,5	8 688,3	8 698,1	8 707,0	8 724,8	8 731,6	8 755,4	8 777,2	8 789,1	8 823,9	8 833,7	8 860,5	8 883,3	8 907,2	8 937,0	8 963,8	8 990,6	9 014,4	20,3	0,2%	UNFCCC Subm 2009			
Portugal	**3 367,0**	**3 371,3**	**3 380,9**	**3 390,6**	**3 400,2**	**3 409,8**	**3 412,8**	**3 415,7**	**3 418,6**	**3 421,5**	**3 424,5**	**3 427,4**	**3 430,3**	**3 433,3**	**3 436,2**	**3 439,1**	**3 442,0**	**3 445,0**	**4,3**	**0,1%**	**nat.data**	**3 485,0**	**3 510,0**	**nat.data**
Romania	6 685,4	6 680,1	6 681,8	6 681,1	6 680,2	6 680,1	6 690,3	6 688,5	6 672,3	6 790,6	6 457,3	6 652,5	6 663,3	6 751,6	6 779,2	6 742,8	6 754,7	6 740,9	3,8	0,1%	UNFCCC Subm 2009			
Slovakia	1 921,7	1 927,9	1 925,8	1 928,3	1 925,9	1 923,5	1 923,7	1 919,9	1 919,3	1 922,0	1 928,3	1 927,4	1 928,7	1 928,8	1 930,7	1 931,6	1 932,0	1 932,9	0,5	0,0%	UNFCCC Subm 2009			
Slovenia	1 071,2	1 081,3	1 085,6	1 089,9	1 094,2	1 097,9	1 098,8	1 109,7	1 111,0	1 115,7	1 134,2	1 142,9	1 149,6	1 157,8	1 163,8	1 169,2	1 173,8	1 183,3	6,6	0,6%	UNFCCC Subm 2009			
Spain	12 545,2	12 545,2	12 545,2	12 545,2	12 602,2	12 681,6	12 778,2	12 867,3	12 951,0	13 005,4	13 067,5	13 104,7	13 126,5	13 149,7	13 170,6	13 191,3	13 213,4	13 230,3	48,8	0,4%	nat.data			
Sweden	**28 200,8**	**28 200,7**	**28 194,3**	**28 189,4**	**28 182,0**	**28 175,7**	**28 175,1**	**28 174,6**	**28 176,1**	**28 180,2**	**28 173,7**	**28 174,0**	**28 181,1**	**28 184,7**	**28 199,8**	**28 197,8**	**28 195,4**	**28 226,0**	**0,6**	**0,0%**	**nat.data**	**28 188,1**	**28 183,1**	**nat.data**
UK	2 244,2	2 263,5	2 280,7	2 298,9	2 316,7	2 335,9	2 351,6	2 368,1	2 383,9	2 399,9	2 415,9	2 432,5	2 444,9	2 456,4	2 466,9	2 476,9	2 483,9	2 493,0	15,0	0,7%	UNFCCC Subm 2009	2 566,8	2 613,7	nat.data
EU-27	**147 094**	**147 070**	**147 477**	**147 929**	**148 365**	**148 747**	**149 162**	**149 526**	**150 403**	**150 277**	**150 510**	**150 982**	**151 350**	**151 766**	**152 571**	**152 939**	**152 926**	**153 012**	**383**	**0,3%**				

Emissions and Removals

To date, the most complete time series on emissions and removals from forests in the European Union comes from the information submitted to the UNFCCC (Convention Reporting) by its Member States.

The EU notes that the reporting categories under the Convention do not fully reflect the activities currently described and defined in the Kyoto Protocol. Where relevant, the conversion from the Convention reporting to the Kyoto Protocol reporting was carried out using the following methodology:

Emissions and Removals from Forest Management were estimated as emissions and removals of all GHG's from the row "Forest Land remaining Forest Land" of CRF Table 5, assuming that "managed forest" under the Convention generally corresponds to "forest management" under the KP.

Emissions and removals from Afforestation and Reforestation were estimated as emissions and removals of all GHG's from the row "Land converted to Forest Land" of CRF Table 5. When the time series started before 1990, the value in a given year was divided by the length of the transition period used by the country (typically 20 yrs) and multiplied by the numbers of years between 1989 and the given year. In the absence of country-specific information, all forest expansion was assumed to be "directly-human induced", which may lead to overestimations of AR removals in some cases.

Emissions and removals from Deforestation were estimated as CO_2 emissions and removals from forests converted to other land uses [5.B.2.1 + 5.C.2.1 + 5.D.2.1 + 5.E.2.1 + 5.F.2.1] + Non-CO2 gases in 5(III)B.2.1 + Biomass burning in forests converted to other land uses [5(V)B.2.1 + 5(V)C.2.1 + 5(V)D.2.1]

This methodology has limitations, mainly in the cases where there are missing data for one or more UNFCCC reporting categories; when forest definitions used under the Convention and under the KP differs substantially; due to the differences in land-use change reporting under the Convention and under the KP, in particular the IPCC default 20 year rule for transition between land uses is not identical with the since 1990 rule used for KP accounting[1]. These limitations have to be kept in mind when using these data in the context of KP accounting rules.

The table presented below reproduces UNFCCC Convention Reporting data, aggregated as explained above, disaggregated by Member State and aggregated in four categories of net-removals / net-emissions: forest management; afforestation and reforestation; deforestation; total.

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[1] Under Convention reporting, forest areas undergo transitions between categories, whereby areas from "land converted to forest land" move to "forest land remaining forest land" category, only after a transition period (generally 20 years). For example, an afforested area in 1980 remains in the L->F category until 1999 and is then transferred to the F->F in 2000. In KP reporting, Article 3.3. areas can not move to Article 3.4 areas; furthermore, deforestation areas cannot move to any other activity (thus it can only increase in time). Article 3.4 forest areas are initiated at 1989 levels and, in most cases, can only decrease in time due to deforestation events (although some exception may occur if, e.g., unmanaged forest become managed).

It should be noted that, due to the data gaps mentioned above, the totals mentioned in the table represents only the sum of the available data, and does not represent the EU total. This is particularly true for AR and Deforestation.

In some cases, Member states are now able to present more recent revisions of data, which may include specific estimation of KP activities, and those have been included in the table and replace UNFCCC data. Those cases are identified in the column “source” where instead of “UNFCCC” you will find “nat.data”. Further details on the new data provided in the table are shortly described in an Annex on country specific notes.

The EU is currently working on projections for forest management emissions and removals. Since Bangkok, more Member States are now prepared to submit national data on projections, which have been included in the table where available. The projection for an EU-27 total results from the sum of individual member-state projections, either directly provided by the member-states or using preliminary modelling results provided by the Joint Research Centre of the European Commission. These values may change due to the ongoing work refining future projections.

At EU level and in all Member States forests have been net-removers of carbon dioxide from the atmosphere for most years in the period 1990-2007. In 2007, the available data indicate a sink of about 395 $MtCO_2eq$ from forest management, and an additional 40 $MtCO_2eq$ from afforestation and reforestation, as well as a source of about 26 $MtCO_2eq$ from deforestation, although data availability for the three activities differ.

Member State	Activity	Historical Net-Removals (-) or Net-Emissions (+) (1.000ton CO_2eq)																		Projected NR or NE		
		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Source	2015	2020	Source
Austria	FM	-11 511	-17 416	-12 214	-16 051	-14 992	-14 288	-9 638	-18 809	-17 028	-21 550	**-16 240**	**-19 040**	**-15 350**	-12 920	-13 750	-13 780	-9 940	-6 700	a)	+400 to -4.300	+2.300 to -2.700	nat.data
	AR	-220	-454	-701	-963	-1 138	-1 295	-1 399	-1 472	-1 512	-1 615	-1 705	-1 782	-1 846	-1 897	-2 007	-2 113	-1 951	-2 173	d)			
	D	2 186	2 233	2 279	2 326	2 242	1 947	1 842	1 737	1 632	1 589	1 546	1 503	1 461	1 418	1 385	1 352	1 143	1 183	c)			
	Total	-9 545	-15 637	-10 637	-14 688	-13 888	-13 636	-9 196	-18 544	-16 908	-21 576	**-16 399**	**-19 319**	**-15 736**	-13 400	-14 372	-14 542	-10 748	-7 690				
Belgium	FM	-3 205	-2 919	-3 233	-3 162	-3 192	-3 019	-3 071	-3 093	-2 977	-2 920	-3 236	-4 510	-4 079	-3 458	-2 901	-2 095	-2 777	-3 169	UNFCCC			
	AR																						
	D																						
	Total	-3 205	-2 919	-3 233	-3 162	-3 192	-3 019	-3 071	-3 093	-2 977	-2 920	-3 236	-4 510	-4 079	-3 458	-2 901	-2 095	-2 777	-3 169				
Bulgaria	FM	-6 157	-7 636	-7 412	-7 476	-7 302	-7 524	-6 517	-6 872	-6 860	-7 200	-8 976	-9 467	-8 318	-7 056	-7 965	-6 996	-6 996	-6 993	UNFCCC	**-9 372**	**-8 172**	**JRC/EFISCEN**
	AR	-5	-2	0																			
	D																						
	Total	-6 162	-7 637	-7 412	-7 476	-7 302	-7 524	-6 517	-6 872	-6 860	-7 200	-8 976	-9 467	-8 318	-7 056	-7 965	-6 996	-6 996	-6 993				
Cyprus	FM																						
	AR																						
	D																						
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Czech Republic	FM	-5 473	-10 021	-11 706	-10 375	-7 857	-7 894	-8 143	-7 356	-7 963	-7 917	-8 171	-8 487	-8 209	-6 455	-6 843	-7 307	-3 965	-1 155	c)	**-3 743**	**323**	**JRC/EFISCEN**
	AR	-20	-42	-60	-82	-97	-110	-129	-146	-169	-171	-190	-199	-245	-277	-303	-331	-356	128	c) d)			
	D	155	261	228	261	192	169	285	258	440	283	227	169	173	270	243	235	168	139	c)			
	Total	-5 338	-9 801	-11 538	-10 196	-7 762	-7 835	-7 987	-7 243	-7 693	-7 804	-8 133	-8 517	-8 280	-6 462	-6 903	-7 403	-4 153	-888				
Denmark	FM	-932	-932	-932	-932	-932	-721	-932	-932	-932	-932	-679	-679	-46	-277	-677	-677	-750	596	nat.data	251	416	nat.data
	AR	-51	-51	-51	-51	-51	-51	-51	-51	-51	-51	-138	-138	-136	-136	-137	-137	-326	132	nat.data	-208	-359	nat.data
	D	0	0	0	0	0	212	0	0	88	0	0	0	632	269	171	0	0	0	nat.data	0	0	nat.data
	Total	-984	-984	-984	-984	-984	-560	-983	-983	-895	-983	-816	-816	450	-144	-643	-814	-1 076	728		43	57	
Estonia	FM	-8 032	-7 785	-9 538	-9 234	-6 971	-6 896	-7 027	-5 123	-4 847	-889	-695	-2 707	-2 282	-4 486	-7 100	-7 252	-8 095	-6 883	UNFCCC	**-3 703**	**-2 939**	**JRC/EFISCEN**
	AR																						
	D																						
	Total	-8 032	-7 785	-9 538	-9 234	-6 971	-6 896	-7 027	-5 123	-4 847	-889	-695	-2 707	-2 282	-4 486	-7 100	-7 252	-8 095	-6 883				
Finland	**FM**	**-23 933**	**-38 311**	**-32 215**	**-31 112**	**-24 689**	**-24 012**	**-33 053**	**-25 857**	**-23 365**	**-25 402**	**-27 002**	**-31 671**	**-31 859**	**-31 452**	**-32 893**	**-37 736**	**-41 435**	**-33 540**	**nat.data**			
	AR	**0**	**-16**	**-34**	**-63**	**-94**	**-110**	**-118**	**-134**	**-150**	**-163**	**-174**	**-184**	**-194**	**-198**	**-201**	**-205**	**-209**	**-213**	**nat.data**			
	D	**1 062**	**961**	**1 107**	**1 636**	**2 720**	**1 580**	**1 613**	**1 609**	**1 846**	**1 651**	**2 312**	**2 789**	**2 964**	**3 006**	**3 698**	**2 841**	**2 050**	**2 069**	**nat.data**			
	Total	**-22 867**	**-37 363**	**-31 132**	**-29 539**	**-22 056**	**-22 536**	**-31 553**	**-24 370**	**-21 668**	**-23 908**	**-24 861**	**-29 065**	**-29 084**	**-28 638**	**-29 393**	**-35 096**	**-39 579**	**-31 678**	**nat.data**	**-10 000**	**-10 000**	**nat.data**
France	**FM**	**-44 729**	**-36 554**	**-41 516**	**-50 371**	**-54 447**	**-54 049**	**-55 844**	**-60 514**	**-61 849**	**-65 168**	**-50 935**	**-57 265**	**-64 966**	**-68 165**	**-68 833**	**-71 244**	**-77 980**	**-81 101**	**nat.data**			
	AR	**-6 514**	**-6 904**	**-7 379**	**-7 837**	**-8 482**	**-9 020**	**-9 617**	**-10 218**	**-10 508**	**-10 739**	**-10 994**	**-11 179**	**-11 216**	**-11 503**	**-11 355**	**-11 702**	**-12 147**	**-12 678**	**nat.data**			
	D	**11 261**	**9 051**	**9 177**	**9 251**	**9 373**	**9 520**	**9 626**	**9 769**	**9 837**	**10 063**	**10 289**	**10 092**	**10 046**	**10 371**	**8 935**	**9 035**	**9 308**	**15 717**	**nat.data**			
	Total	**-39 981**	**-34 407**	**-39 718**	**-48 957**	**-53 555**	**-53 549**	**-55 835**	**-60 964**	**-62 519**	**-65 843**	**-51 640**	**-58 353**	**-66 136**	**-69 297**	**-71 253**	**-73 911**	**-80 819**	**-78 062**	**nat.data**			
Germany	**FM**	**-79 967**	**-80 259**	**-75 392**	**-73 091**	**-70 215**	**-68 838**	**-68 106**	**-64 283**	**-63 317**	**-63 375**	**-42 750**	**-62 547**	**-59 991**	**-37 643**	**-27 269**	**-23 023**	**-18 856**	**-8 233**	**nat.data**	**183**	**1 613**	**nat.data**
	AR	**-50**	**-186**	**-322**	**-457**	**-593**	**-729**	**-865**	**-1 001**	**-1 137**	**-1 273**	**-1 409**	**-1 545**	**-1 681**	**-1 817**	**-1 953**	**-2 089**	**-2 225**	**-2 361**	**nat.data**			
	D	**2 875**	**2 923**	**2 971**	**3 019**	**3 067**	**3 115**	**3 163**	**3 211**	**3 259**	**3 307**	**3 355**	**3 406**	**3 432**	**3 447**	**3 462**	**3 478**	**4 504**	**3 553**	**nat.data**			
	Total	**-77 141**	**-77 521**	**-72 742**	**-70 529**	**-67 742**	**-66 452**	**-65 808**	**-62 074**	**-61 195**	**-61 342**	**-40 804**	**-60 686**	**-58 240**	**-36 013**	**-25 760**	**-21 634**	**-16 577**	**-7 041**	**nat.data**	**183**	**1 613**	**nat.data**

Member State	Activity	Historical Net-Removals (-) or Net-Emissions (+) (1.000ton CO_2eq)																		Projected NR or NE		
		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Source	2015	2020	Source
Greece	FM	-1.990	-2.319	-1.850	-2.498	-2.236	-2.996	-2.946	-2.737	-2.186	-2.917	-1.359	-3.641	-3.871	-3.932	-3.804	-3.767	-3.707	-2.303	UNFCCC			
	AR	0	0	0	0	-25	-58	-90	-152	-171	-213	-238	-374	-398	-425	-450	-476	-500	-524	UNFCCC			
	D																						
	Total	-1.990	-2.319	-1.850	-2.498	-2.261	-3.054	-3.036	-2.889	-2.357	-3.130	-1.597	-4.015	-4.269	-4.357	-4.254	-4.243	-4.207	-2.827				
Hungary	FM	-3.913	-4.379	-5.183	-7.257	-7.920	-7.920	-3.286	-3.331	-5.185	-1.973	-1.185	-3.029	-2.594	-4.742	-4.030	-5.293	-4.436	-4.067	UNFCCC	**-3.291**	**-3.140**	**JRC/EFISCEN**
	AR	-4	-17	51	-312	-275	58	715	578	-50	-200	1.114	872	1.419	66	-711	1.513	667	-435	d)			
	D																						
	Total	-3.917	-4.396	-5.132	-7.569	-8.196	-7.862	-2.571	-2.753	-5.235	-2.173	-70	-2.157	-1.175	-4.676	-4.742	-3.781	-3.770	-4.502				
Ireland	**FM**	**-1.251**	**-1.378**	**-1.235**	**-1.202**	**-1.045**	**-944**	**-880**	**-825**	**-924**	**-950**	**-695**	**-592**	**-721**	**-1.076**	**-795**	**-848**	**-946**	**-1.224**	**nat.data**	**-773**	**737**	**nat.data**
	AR	**10**	**7**	**-10**	**-35**	**-64**	**-101**	**-153**	**-223**	**-349**	**-439**	**-561**	**-761**	**-953**	**-1.152**	**-1.376**	**-1.618**	**-1.503**	**-1.634**	**nat.data**	**-3.821**	**-4.788**	**nat.data**
	D	**5**	**5**	**5**	**5**	**7**	**7**	**8**	**9**	**9**	**10**	**11**	**14**	**12**	**15**	**15**	**18**	**19**	**21**	**nat.data**	**11**	**11**	**nat.data**
	Total	**-1.235**	**-1.367**	**-1.241**	**-1.231**	**-1.102**	**-1.039**	**-1.025**	**-1.040**	**-1.263**	**-1.379**	**-1.245**	**-1.339**	**-1.662**	**-2.213**	**-2.156**	**-2.447**	**-2.430**	**-2.837**	**nat.data**	**-4.583**	**-4.040**	**nat.data**
Italy	**FM**	**-46.157**	**-66.134**	**-62.712**	**-49.647**	**-63.989**	**-68.300**	**-71.294**	**-63.953**	**-62.131**	**-68.974**	**-63.166**	**-70.783**	**-76.811**	**-66.835**	**-72.480**	**-74.916**	**-76.190**	**-50.165**	**nat.data**	**-55.896**	**-53.981**	**JRC/EFISCEN**
	AR	**-960**	**-1.193**	**-1.240**	**-1.170**	**-1.337**	**-1.451**	**-1.562**	**-1.577**	**-1.621**	**-1.737**	**-1.754**	**-1.878**	**-2.009**	**-2.006**	**-2.120**	**-2.220**	**-2.368**	**-2.238**				
	D																						
	Total	**-47.117**	**-67.327**	**-63.953**	**-50.817**	**-65.327**	**-69.750**	**-72.856**	**-65.530**	**-63.752**	**-70.711**	**-64.920**	**-72.661**	**-78.820**	**-68.841**	**-74.600**	**-77.135**	**-78.559**	**-52.404**				
Latvia	FM	-21.616	-22.966	-24.044	-24.124	-23.986	-23.993	-24.992	-23.580	-23.193	-23.212	-24.198	-29.768	-25.600	-26.018	-27.868	-28.053	-32.418	-31.610	nat.data	**-28.140**	**-28.279**	**JRC/EFISCEN**
	AR	-1	-3	-4	-7	-9	-12	-15	-21	-24	-29	-35	-44	-47	-51	-54	-58	-62	-78	nat.data			
	D	-5	-5	-5	-5	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-18				
	Total	-21.622	-22.974	-24.053	-24.136	-24.001	-24.010	-25.013	-23.607	-23.223	-23.247	-24.239	-29.817	-25.653	-26.074	-27.928	-28.117	-32.485	-31.706				
Lithuania	FM	-9.593	-9.407	-9.455	-8.233	-8.767	-6.949	-7.510	-8.006	-8.408	-8.433	-7.843	-7.628	-7.048	-7.406	-7.651	-7.999	-8.138	-8.179	UNFCCC	**-8.144**	**-7.523**	**JRC/EFISCEN**
	AR	-97	-188	-272	-351	-423	-489	-550	-612	-692	-774	-848	-918	-1.003	-1.116	-1.244	-1.425	-1.540	-1.631	d)			
	D																						
	Total	-9.689	-9.594	-9.727	-8.584	-9.190	-7.438	-8.060	-8.617	-9.100	-9.207	-8.691	-8.546	-8.051	-8.522	-8.894	-9.424	-9.678	-9.810				
Luxembourg	FM																						
	AR																						
	D																						
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Malta	FM																						
	AR																						
	D																						
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Netherlands	FM	-2.529	-2.898	-2.648	-2.864	-2.874	-2.739	-2.927	-2.658	-2.741	-2.677	-2.448	-2.495	-2.566	-2.558	-2.493	-2.414	-2.359	-2.167	UNFCCC	**-2.042**	**-2.081**	**JRC/EFISCEN**
	AR	-3	-8	-17	-28	-42	-49	-79	-102	-127	-155	-222	-262	-306	-353	-403	-457	-514	-575	UNFCCC			
	D	265	271	277	283	290	296	303	310	316	323	317	324	332	340	346	352	358	364	UNFCCC			
	Total	-2.267	-2.635	-2.388	-2.609	-2.626	-2.491	-2.703	-2.450	-2.551	-2.509	-2.353	-2.432	-2.540	-2.571	-2.550	-2.519	-2.514	-2.378				

Member State	Activity	Historical Net-Removals (-) or Net-Emissions (+) (1.000ton CO_2eq)																		Projected NR or NE		
		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Source	2015	2020	Source
Poland	FM	-35.944	-41.908	-40.265	-33.849	-33.339	-33.091	-33.784	-35.723	-35.608	-35.918	-36.148	-35.484	-41.204	-42.043	-44.633	-45.991	-50.832	-50.552	UNFCCC	**-41.493**	**-43.233**	**JRC/EFISCEN**
	AR	-158	-295	-492	-624	-838	-934	-1.102	-1.322	-1.449	-1.737	-1.572	-1.849	-2.095	-2.285	-2.525	-2.873	-3.240	-3.577	d)			
	D																						
	Total	-36.102	-42.203	-40.757	-34.473	-34.176	-34.025	-34.886	-37.044	-37.058	-37.655	-37.720	-37.333	-43.299	-44.328	-47.157	-48.864	-54.072	-54.129				
Portugal	**FM**	**3.351**	**4.016**	**-537**	**-1.230**	**-2.501**	**98**	**-2.967**	**-3.871**	**-2.446**	**-3.084**	**-1.714**	**-2.603**	**-2.067**	**8.072**	**1.366**	**7.161**	**720**	**-116**	**nat.data**	**-281**	**-268**	**nat.data**
	AR	**-78**	**-141**	**-261**	**-357**	**-460**	**-453**	**-615**	**-742**	**-744**	**-895**	**-884**	**-1.046**	**-1.079**	**-560**	**-1.246**	**-844**	**-1.460**	**-1.623**	**nat.data**	**-1.813**	**-2.086**	**nat.data**
	D	**521**	**521**	**521**	**521**	**521**	**521**	**513**	**513**	**513**	**513**	**513**	**513**	**513**	**494**	**494**	**494**	**487**	**487**	**nat.data**	**469**	**469**	**nat.data**
	Total	**3.794**	**4.396**	**-278**	**-1.067**	**-2.441**	**166**	**-3.068**	**-4.100**	**-2.677**	**-3.465**	**-2.084**	**-3.136**	**-2.633**	**8.005**	**613**	**6.810**	**-253**	**-1.251**	**nat.data**	**-1.625**	**-1.885**	**nat.data**
Romania	FM	-35.583	-37.041	-37.846	-39.131	-39.734	-38.987	-38.003	-38.390	-40.481	-39.208	-37.999	-39.007	-36.536	-36.174	-35.492	-37.181	-37.200	-36.222	UNFCCC	**-31.811**	**-24.848**	**JRC/EFISCEN**
	AR																						
	D																						
	Total	-35.583	-37.041	-37.846	-39.131	-39.734	-38.987	-38.003	-38.390	-40.481	-39.208	-37.999	-39.007	-36.536	-36.174	-35.492	-37.181	-37.200	-36.222				
Slovakia	FM	-4.436	-5.474	-6.045	-6.123	-5.195	-4.388	-3.955	-2.704	-3.117	-2.784	-4.301	-5.533	-5.624	-5.137	-3.510	-159	-2.555	-2.718	UNFCCC	**-1.655**	**-1.438**	**JRC/EFISCEN**
	AR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-464	-514	-519	-525	UNFCCC			
	D	-1.775	-1.629	-1.962	-1.606	-999	-615	-609	-1.861	-677	-420	-1.682	204	98	269	92	152	344	344	UNFCCC			
	Total	-6.211	-7.103	-8.007	-7.729	-6.194	-5.003	-4.564	-4.565	-3.794	-3.204	-5.983	-5.330	-5.526	-4.868	-3.883	-521	-2.731	-2.899				
Slovenia	FM	-3.186	-3.924	-3.941	-4.423	-4.397	-4.905	-4.795	-4.328	-4.750	-5.077	-5.175	-5.275	-5.496	-5.318	-5.644	-5.430	-4.733	-5.774	UNFCCC			
	AR																						
	D																						
	Total	-3.186	-3.924	-3.941	-4.423	-4.397	-4.905	-4.795	-4.328	-4.750	-5.077	-5.175	-5.275	-5.496	-5.318	-5.644	-5.430	-4.733	-5.774				
Spain	FM	-19.733	-19.652	-19.821	-19.836	-19.343	-19.763	-19.875	-19.783	-19.786	-19.837	-19.746	-19.850	-19.808	-19.766	-19.796	-19.661	-19.359	-19.883	b)	**-14.961**	**-15.558**	**JRC/EFISCEN**
	AR	0	0	0	0	-461	-1.109	-2.000	-2.822	-3.664	-4.185	-4.896	-5.358	-5.565	-5.798	-5.964	-6.116	-6.343	-6.465	b)			
	D																						
	Total	-19.733	-19.652	-19.821	-19.836	-19.804	-20.872	-21.875	-22.605	-23.450	-24.022	-24.642	-25.208	-25.373	-25.564	-25.760	-25.777	-25.702	-26.349				
Sweden	**FM**	**-35.890**	**-39.373**	**-36.889**	**-33.694**	**-30.487**	**-28.993**	**-36.112**	**-39.695**	**-39.716**	**-38.088**	**-37.617**	**-35.725**	**-36.684**	**-36.771**	**-31.476**	**-28.196**	**-26.247**	**-21.988**	**UNFCCC**	**-22.313**	**-20.648**	**nat.data**
	AR	**-20**	**-20**	**-50**	**-50**	**-50**	**-100**	**-100**	**-150**	**-200**	**-200**	**-300**	**-350**	**-400**	**-450**	**-500**	**-700**	**-850**	**-1.050**	**nat.data**	**-1.700**	**-2.300**	**nat.data**
	D	**850**	**1.200**	**1.450**	**1.700**	**1.650**	**2.750**	**2.250**	**1.900**	**2.050**	**3.000**	**1.850**	**1.900**	**1.900**	**3.100**	**2.900**	**2.500**	**2.200**	**1.900**	**nat.data**	**3.300**	**3.300**	**nat.data**
	Total	**-35.060**	**-38.193**	**-35.489**	**-32.044**	**-28.887**	**-26.343**	**-33.962**	**-37.945**	**-37.866**	**-35.288**	**-36.067**	**-34.175**	**-35.184**	**-34.121**	**-29.076**	**-26.396**	**-24.897**	**-21.138**	**C/nat.data**	**-20.713**	**-19.648**	**nat.data**
United	**FM**	**-12.179**	**-12.804**	**-13.526**	**-13.801**	**-14.117**	**-13.429**	**-13.072**	**-12.563**	**-12.301**	**-12.263**	**-12.333**	**-12.692**	**-13.235**	**-13.642**	**-14.088**	**-13.391**	**-12.577**	**-11.500**	**nat.data**	**-4.198**	**-675**	**nat.data**
Kingdom	**AR**	**-3**	**87**	**81**	**-12**	**-193**	**-417**	**-668**	**-908**	**-1.128**	**-1.324**	**-1.490**	**-1.648**	**-1.829**	**-2.014**	**-2.188**	**-2.348**	**-2.506**	**-2.642**	**nat.data**	**-3.411**	**-4.059**	**nat.data**
	D	**393**	**388**	**386**	**364**	**386**	**376**	**433**	**460**	**471**	**627**	**770**	**914**	**820**	**813**	**764**	**762**	**701**	**669**	**nat.data**	**644**	**598**	**nat.data**
	Total	**-11.789**	**-12.328**	**-13.059**	**-13.448**	**-13.924**	**-13.470**	**-13.306**	**-13.011**	**-12.959**	**-12.960**	**-13.052**	**-13.426**	**-14.244**	**-14.843**	**-15.512**	**-14.977**	**-14.382**	**-13.473**	**nat.data**	**-6.965**	**-4.136**	**nat.data**
EU-27	**FM**	**-414.588**	**-467.473**	**-460.156**	**-449.716**	**-450.528**	**-444.539**	**-458.729**	**-454.984**	**-452.110**	**-460.746**	**-414.610**	**-470.477**	**-474.965**	**-435.259**	**-440.626**	**-436.247**	**-451.770**	**-395.647**		**-317.716**	**-295.374**	
Total	**AR**	**-8.174**	**-9.423**	**-10.763**	**-12.399**	**-14.633**	**-16.430**	**-18.400**	**-21.075**	**-23.748**	**-25.900**	**-26.296**	**-28.643**	**-29.582**	**-31.974**	**-35.201**	**-34.713**	**-37.952**	**-40.160**				
	D	**17.793**	**16.179**	**16.434**	**17.754**	**19.442**	**19.870**	**19.422**	**17.909**	**19.779**	**20.941**	**19.503**	**21.822**	**22.378**	**23.805**	**22.498**	**21.212**	**21.277**	**26.428**				
	Total	**-404.965**	**-460.714**	**-454.475**	**-444.361**	**-445.712**	**-441.094**	**-457.702**	**-458.139**	**-456.079**	**-465.699**	**-421.399**	**-477.295**	**-482.164**	**-443.420**	**-453.325**	**-449.743**	**-468.430**	**-409.374**				

NOTES

a) UNFCCC + nat.data for some years - please refer to country annex for details

b) national data - please refer to country annex for details

c) UNFCCC + KP data for some years - please refer to country annex for details

d) UNFCCC data corrected due to 20years transition rule - see text above for details

e) EC JRC projection

Natural Disturbances

In the amendments it seeks for forest accounting under the KP, the EU proposes to address *force majeure*, i.e., the compliance risk arising extraordinary events or circumstances that are beyond the control of Parties.

The concept of *force majeure* proposed by the EU addresses only emissions from events beyond the control of parties and large enough to pose compliance risk. The information presented illustrates the level and, where possible, the inter-annual variability of some of these events and the ranges that were observed in the available time series. The EU does not, in this submission, make any judgement on which events or circumstances would qualify as *force majeure*. That issue will be addressed in the negotiations with other Parties.

Information on emissions and removals, by natural disturbance type, are not ready to be presented at this stage. The tables shown below present the data available on forest areas affected by natural disturbances at Member-State level. Natural disturbances are aggregated in two categories: *Storms, Wind and Snow* and *Fires*. Other natural disturbances include damage from *pests and diseases* and from *drought*. Although data on Insects and diseases also exists in some international databases, the EU found the data to be not directly comparable between MS, as each country follows own definitions, but all Member States report on at least some forest damage to FAO, UNECE, MCPFE and ICP Forests.

Additional qualitative analysis of natural disturbances using the report from the study 'Feasibility Study on means of combating forest dieback in the European Union', commissioned by the European Commission[2] was also included.

The EU notes that several types of natural disturbances often act in combination, e.g. forests damaged by fire or storm are more susceptible to insect or fungi attack or, vice versa, forests attacked by insects or fungi are more susceptible to storm or snow break. It may therefore be difficult to assign damaged forest areas to one specific natural disturbance type.

According to MCPFE (2003) storm, wind, snow or other identifiable abiotic factors represent the most important causes of damage in many countries. Insects and diseases represent the second most important causes of damage. Damage by unidentified causes was reported by 15 countries. Fire is the most important damaging agent in the Mediterranean countries.

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22 http://ec.europa.eu/environment/forests/pdf/forestdieback_backgroundreport.pdf

STORMS, WIND, SNOW

Over the past decades damage severity has increased with extensive storm events, for instance, in 1990 cyclones ‘Vivian’ and ‘Wiebke’, in 1999 cyclone ‘Lothar’, in 2001 cyclones ‘Pyry’ and ‘Janika’, in 2005 cyclone ‘Gudrun’, in 2007 cyclone ‘Kyrill’ and latest storm ‘Klaus’’ in 2009. This is almost half of the annual wood production in Europe. In November 2004 storms damaged 330,000 ha forests in the Slovac Republic with 5.4 Mio m3 timber thrown (total annual cut 6.7 Mio m3). On 8/9 Jan 2005 cyclone ‘Gudrun’ hit mainly Sweden and Denmark; in Sweden 75 Mio m3 timber (nearly 1 annual cut) had to be harvested; in 2006 about 50 Mio Euro had to be invested for reforestation; in Denmark 1.5-2 Mio m3 timber (1.5-2 times annual cut) had to be harvested, about 2000 ha private forest and 700 ha state forest were clearfelled, 750 ha private forest damaged. In western part of Finland storms ‘Pyry’ (1.11) and ‘Janika’ (16-17.11) damaged 7,3 Mio m3 of timber in November 2001 (Ihalainen and Ahola 2003). On 14/18 Jan 2007 storm ‘Kyrill’ caused salvage felling and harvesting of 20 Mio m3 in Germany, 12 Mio m3 in Sweden and 0.6 Mio m3 in Belgium. On 24 Jan 2009 storm ‘Klaus’ damaged 680 Kha forests in France (90% of maritime pine forests: 326 000 ha damaged at less than 20%, 120 000 damaged between 20-40%, 69 000 ha damaged between 40-60%, 164 000 ha damaged at more than 60%) with 42,3 Mio m3 timber thrown (nearly ¾ times annual cut). After ‘Lothar’ in 1999, the Swiss Federal Office for the Environment (BAFU) initiated a basic research programme on causes and risk-development of storms. Normally, snow and ice do not severely damage trees, but influence their growth direction and may in case of repeated avalanches, lead to decrease in stability. Still, with increasing age and diameter, the danger of breaking also increases.

Member State	Storm, Wind & Snow (1.000ha)																
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Source
Austria																	UNECE
Belgium											2,6					2,1	UNECE
Bulgaria	3,8										29,6					10,5	UNECE
Cyprus	0,0										0,0					0,0	UNECE
Czech Rep.	19,4										9,6					10,3	UNECE
Denmark										20,0						15,0	nat.data
Estonia											18,0					33,0	UNECE
Finland	207,0										274,0					250,0	UNECE
France	9,0										230,0					0,0	UNECE
Germany																	UNECE
Greece																	UNECE
Hungary	63,0										117,9					104,3	UNECE
Ireland	0,6	0,3	0,4	0,3	0,5	0,1	0,3	0,2	1,3	3,0	3,0	1,3	0,8	0,4	0,2	0,3	nat.data
Italy											803,0					605,0	UNECE
Latvia											1,0					240,7	UNECE
Lithuania	36,9										58,7					41,7	UNECE
Luxembourg	5,3										0,3					0,3	UNECE
Malta																	UNECE
Netherlands																	UNECE
Poland																	UNECE
Portugal											67,0						UNECE
Romania	150,0																UNECE
Slovakia	4,8										6,0					10,9	UNECE
Slovenia											0,3					0,3	UNECE
Spain																	UNECE
Sweden	661,0										652,0					1.071,0	UNECE
United Kingdom	5,5										5,5					5,5	UNECE
EU-27 Total	**1.166**										**2.278**					**2.401**	

Note that the definition used for the table from UNECE is: Damaged areas to be reported are areas with damage present in the reporting year. This means that there may be an accumulation of areas as long as it is judged that an area is affected. After some years of recovery the affected area will leave the definition of damage.

Total Burnt Area and Forest Fires

Data for area affected by fires comes for the European's Commission Joint Research Centre – European Forest Fire Information System (http://effis.jrc.ec.europa.eu/) and covers most Member-States for the time period 1990-2008.

At EU-27 level, 400 to 500 thousand hectares burned every year between 1990 and 2008. Annual values ranged between a minimum of 180.000ha in 2008 and a maximum of 818.000ha in 2003. The later coincided with a severe heat wave that was felt throughout Europe.

Natural factors, such as such as droughts, winds, the relief and difficulties of access play a decisive part in the scale and spread of the fires, but they are mainly not initiating a fire.

According to the European Forest Fire Information System (EFFIS), in average less than 10% of all fires are provoked by natural causes (e.g. lightening, heat). The vast majority of fires are caused as a result of human activity. Of these, 30% are of a criminal nature, or in pursuit of various interests such as urban development, game management, timber production and livestock farming. 50% are due to negligence, age-old rural practices such as burning the stubble and regenerating annual pastureland for livestock, day-trippers, recreational activities etc, while the causes of the remainder are unclear. The percentage of unknown or unclear causes has fallen in recent decades, a result primarily of more thorough investigations.

In the period 1990-2008, the five member-states around the Mediterranean Basin (France, Greece, Italy, Portugal and Spain) accounted for more than 85% of total burnt area, reflecting the hotter and dryer conditions that those countries experienced during summer.

Further analysis of the data shows that the inter-annual variability in each Member State is very high and no clear trends are identifiable, suggesting that other factors – alongside fire suppression – play a role in determining the areas affected by fires.

Also visible is the fact that the years with most impact vary from member-state to Member State, reflecting variations in climatic conditions around the Mediterranean Basin. In 2005 fires were particularly severe in Portugal and Spain, with Greece and Italy showing relatively small figures in that year. Just two years later, in 2007, the exact opposite happened, with Greece and Italy being severely hit by fires, while Portugal and Spain experienced much lower than average values.

Member State	Total Burnt Area (1.000ha)																						
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Min	median	average	Max	Source
Austria																0,1	0,1	0,0		0,0	0,1	0,1	0,1	EFFIS
Belgium																								EFFIS
Bulgaria		0,5	5,2	18,2	18,1	0,6	0,9	0,6	6,9	8,2	57,4	20,2	6,5	5,0	1,1	1,5	3,5	43,0	5,3	0,5	5,3	11,3	57,4	EFFIS
Cyprus											8,0	4,8	2,2	2,3	1,2	1,8	1,2	2,5	2,4	1,2	2,3	2,9	8,0	EFFIS
Czech Rep.	0,2	0,1	1,3	1,1	0,8	0,4	2,0	3,4	1,1	0,3	0,4	0,1	0,2	1,2	0,3	0,2	0,4	0,3		0,1	0,4	0,8	3,4	nat.data
Denmark																								EFFIS
Estonia													2,1	0,2	0,4	0,1	2,6	0,3	1,3	0,1	0,4	1,0	2,6	EFFIS
Finland							0,4	1,1	0,1	0,6	0,3	0,2	0,6	0,7	0,4	0,5	1,6	0,6	0,8	0,1	0,6	0,6	1,6	EFFIS
France	72,6	10,1	16,6	16,7	25,0	18,1	11,4	21,6	19,3	15,9	24,1	20,6	30,1	73,3	13,7	22,1	7,8	8,5	6,0	6,0	18,1	22,8	73,3	EFFIS
Germany		0,9	4,9	1,5	1,1	0,6	1,4	0,6	0,4	0,4	0,6	0,1	0,1	1,3	0,3	0,2	0,5	0,3	0,5	0,1	0,6	0,9	4,9	EFFIS
Greece	38,6	23,6	66,3	54,0	52,6	19,2	23,0	34,8	92,9	8,3	145,0	18,4	4,3	3,3	10,7	6,4	12,7	213,9	29,2	3,3	23,6	45,1	213,9	nat.data
Hungary										0,8	1,6		1,2	0,8	0,2	3,5	0,6	4,6	2,4	0,2	1,2	1,7	4,6	EFFIS
Ireland																								
Italy	195,3	99,9	105,7	203,7	136,3	48,9	58,0	111,2	155,6	71,1	114,6	76,4	40,8	91,8	60,2	47,6	39,9	227,7	66,3	39,9	91,8	102,7	227,7	EFFIS
Latvia	0,3	0,1	8,4	0,6	0,3	0,5	0,9	0,4	0,2	1,5	1,3	0,3	2,2	0,6	0,5	0,1	3,4	0,3	0,4	0,1	0,5	1,2	8,4	EFFIS
Lithuania			0,8	0,3	0,3	0,3	0,5	0,2	0,1	0,5	0,4	0,1	0,7	0,4	0,3	0,1	1,2	0,0	0,1	0,0	0,3	0,4	1,2	EFFIS
Luxembourg																								
Malta																								
Netherlands																								
Poland	7,3	2,6	43,8	8,3	9,2	5,3	14,1	6,6	4,0	8,3	7,0	3,4	5,6	28,6	4,3	7,4	5,9	2,8	3,0	2,6	6,6	9,3	43,8	EFFIS
Portugal	137,3	182,5	57,0	50,0	77,3	169,6	88,9	30,5	158,4	70,6	159,6	111,9	124,4	425,7	129,5	338,3	75,5	31,5	17,2	17,2	111,9	128,2	425,7	EFFIS
Romania	0,4	0,3	0,7	0,5	0,3	0,2	0,2	0,1	0,1	0,4	3,6	1,0	3,5	0,8	0,1	0,2	0,9	2,5	0,4	0,1	0,4	0,9	3,6	EFFIS
Slovakia										0,6	0,9	0,3	0,6	1,6	0,2	0,5	0,3	0,7	0,1	0,1	0,6	0,6	1,6	EFFIS
Slovenia													0,2	2,1	0,1	0,3	1,4	0,1		0,1	0,3	0,7	2,1	EFFIS
Spain	213,2	281,9	110,2	96,4	480,8	144,7	77,5	99,9	158,7	85,2	221,2	106,1	115,9	174,8	157,7	200,5	166,6	98,7	39,9	39,9	144,7	159,5	480,8	nat.data
Sweden							1,6	5,9	0,4	1,8	1,6	1,3	2,6	4,0	1,9	1,6	5,7	1,1	4,3	0,4	1,8	2,6	5,9	EFFIS
United Kingdom																								
EU-27 Total	**665**	**602**	**421**	**451**	**802**	**408**	**281**	**317**	**598**	**274**	**748**	**365**	**344**	**818**	**383**	**633**	**332**	**640**	**180**	**180**	**411**	**493**	**818**	

NOTES

EFFIS - JRC European Forest Fire Information System

EFFIS data cover burnt areas for different land use types. Due to changes in the way was collected over time, consistent time series going back to 1990 are only available to total burnt area. The table below presents the data on forest burnt areas, reported by Member States where that information was available. As it can be seen from comparing the two tables, the variability of affected areas is very similar.

Member State	Forest Burnt Area (1.000ha)																							Projections		
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Min	median	average	Max	Source	2015	2020	Source
Austria																											
Belgium																											
Bulgaria																											
Cyprus																											
Czech Rep.																											
Denmark																											
Estonia																											
Finland	**0,4**	**0,2**	**1,1**	**0,0**	**0,8**	**0,5**	**0,4**	**1,1**	**0,1**	**0,6**	**0,3**	**0,2**	**0,6**	**0,7**	**0,4**	**0,5**	**1,6**	**0,6**		**0,0**	**0,5**	**0,6**	**1,6**	**UNFCCC**			
France																											
Germany	**1,6**	**0,9**	**4,9**	**1,5**	**1,1**	**0,6**	**1,4**	**0,6**	**0,4**	**0,4**	**0,6**	**0,1**	**0,1**	**1,3**	**0,3**	**0,2**	**0,5**	**0,3**		**0,1**	**0,6**	**0,9**	**4,9**	**nat.data**			
Greece	21,1	8,0	23,2	24,2	23,4	9,0	8,1	16,1	46,1	4,8	69,6	8,4	0,9	1,0	2,6	2,2	6,5	83,3	13,4	0,9	9,0	19,6	83,3	nat.data			
Hungary																											
Ireland	0,4	0,3	0,2	0,3	0,4	0,5	0,6	0,3	0,2	0,1	0,3	0,7	0,2	0,9	0,6	0,2	0,2	0,2		0,1	0,3	0,4	0,9	nat.data	**0,2**	**0,2**	**nat.data**
Italy	98,4	30,2	44,5	116,4	47,1	21,0	20,3	62,8	73,0	39,4	58,2	38,2	20,2	44,1	20,9	21,5	16,4	116,6		16,4	41,7	49,4	116,6	nat.data			
Latvia	0,3	0,1	8,4	0,6	0,0	0,5	0,9	0,4	0,2	1,5	1,3	0,3	2,4	0,6	0,5	0,1	3,4	0,3		0,0	0,5	1,2	8,4	nat.data			
Lithuania																											
Luxembourg																											
Malta																											
Netherlands																											
Poland																											
Portugal	**79,5**	**125,5**	**39,7**	**23,8**	**13,5**	**87,6**	**30,5**	**11,5**	**57,4**	**31,1**	**68,6**	**45,6**	**65,2**	**286,0**	**56,1**	**213,5**	**36,3**	**9,6**		**9,6**	**50,9**	**71,2**	**286,0**	**nat.data**	**56,2**	**55,1**	**nat.data**
Romania																											
Slovakia																											
Slovenia																											
Spain	73,2	116,9	40,4	33,4	250,4	42,1	10,3	21,3	42,7	23,9	45,9	19,2	25,2	53,7	51,7	69,4	71,1	29,4		10,3	42,4	56,7	250,4	nat.data			
Sweden	**1,7**	**1,4**	**1,4**	**1,5**	**1,4**	**1,4**	**1,7**	**6,6**	**0,8**	**3,6**	**2,6**	**3,4**	**5,1**	**5,4**	**5,3**	**4,4**	**8,8**	**2,4**		**0,8**	**2,5**	**3,3**	**8,8**	**nat.data**	**4,2**	**4,2**	**nat.data**
United Kingdom	0,6	1,1	0,3	0,5	0,4	2,9	1,4	1,9	1,0	0,2	0,6	0,7	0,6	0,5	0,6	0,1	1,5	1,7	1,6	0,1	0,6	1,0	2,9	nat.data	**0,6**	**0,8**	**nat.data**
EU-27 Total	**277**	**285**	**164**	**202**	**338**	**166**	**76**	**123**	**222**	**106**	**248**	**117**	**120**	**394**	**139**	**312**	**146**	**244**		**76**	**184**	**204**	**394**		**61**	**60**	

PESTS AND DISEASES

Although some data on areas affected by pest and diseases is reported to FAO, UNECE and MCPFE by EU Member States, the EU decided not to present them due to a lack of clarity in interpreting what constitutes a 'disturbance'.

Drought and Heat

Drought as stress factor induces defoliation and weakens trees, thus accelerating their vulnerability against other damaging agents and decreasing productivity. Much of Europe was affected by extreme heat waves during the summer of 2003 and 2004. The ICP Forests monitoring data showed a marked effect of these weather extremes on forest condition (see ICP Forests, 2005, 2006). In some regions of central Europe defoliation scores in 2003 and 2004 were the highest ever recorded. Continuous growth measurements revealed growth reductions at low altitudes, whereas at higher elevations and in the far north accelerated tree growth was measured. Especially damaging insect populations like bark beetles increased under the favourable warm and dry weather condition in 2003.

Harvested Wood Products

In this section the EU provides raw data on both harvest rates, using the FAO wood production as a proxy and on emissions and removals from the HWP pool.

Total Harvest Rates

About 449 million cubic meters over bark were produced by European forests in 2007, reflecting an average growth in harvesting rates of about 10 Mm^3ob / year.

Member State	Total Roundwood Production (1000m^{3}ob)																				
	Historical																			Projected		
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Source	2015	2020	Source
Austria	17 620	12 871	13 719	13 727	16 083	15 462	16 811	16 493	15 717	15 774	14 869	15 083	16 627	19 102	18 461	18 447	21 431	23 875	nat.data			
Belgium											4 510	4 215	4 500	4 765	4 850	4 950	5 075	4 945	FAO			
BEL+LUX	5 610	4 755	4 240	4 240	4 340	4 110	3 985	4 005	4 837	5 059									FAO			
Bulgaria	4 089	3 650	3 545	3 547	2 685	2 844	3 205	3 041	3 231	4 352	4 784	3 992	4 833	4 833	5 986	5 862	5 992	5 696	FAO			
Cyprus	63	54	45	53	47	48	45	41	35	36	21	18	15	12	10	10	7	20	FAO			
Czech Rep.	13 332	10 751	9 850	10 406	11 950	12 365	12 600	13 491	13 991	14 203	14 441	14 374	14 541	15 140	15 601	15 510	17 678	18 508	FAO			
Denmark	2 255	2 309	2 228	2 281	2 282	2 282	2 282	2 129	1 558	1 560	2 952	1 613	1 446	1 627	1 516	2 963	2 358	2 566	FAO			
Estonia	0	0	2 146	2 439	3 550	3 710	3 901	5 393	6 061	6 704	8 910	10 200	10 500	10 500	6 800	5 500	5 400	5 900	FAO			
Finland	43 230	34 863	38 482	42 244	48 745	50 219	46 597	51 329	53 660	53 637	54 262	52 210	53 389	54 240	54 398	52 250	50 812	56 870	FAO			
France	68 128	68 822	68 688	64 551	65 625	65 773	62 623	62 903	62 314	61 729	70 522	64 320	59 300	56 980	57 269	56 832	57 622	58 786	nat.data			
Germany	ne	45 646	49 480	51 314	53 530	54 535	54 988	57 971	58 608	58 426	74 989	58 816	60 711	65 762	73 925	82 947	87 117	96 123	b)	102 064	104 608	b)
Greece	2 492	2 546	2 321	2 218	2 091	1 961	2 012	1 744	1 692	2 214	2 245	1 916	1 591	1 673	1 694	1 523	1 562	1 743	FAO			
Hungary	5 973	5 490	5 006	4 496	4 527	4 331	3 653	4 241	4 167	5 231	5 902	5 811	5 836	5 785	5 660	5 940	5 913	5 640	FAO			
Ireland	1 787	1 837	2 156	2 003	2 220	2 424	2 520	2 398	2 493	2 842	2 940	2 700	2 911	2 951	2 818	2 913	2 938	2 981	UNECE	**4 288**	**5 750**	**nat.data**
Italy	7 972	8 327	8 357	8 818	9 465	9 736	9 121	9 146	9 550	11 138	9 329	8 099	7 511	8 219	8 697	8 691	8 619	8 124	FAO			
Latvia	5 000	4 400	4 000	4 800	5 700	6 900	6 800	8 900	10 000	10 800	11 000	11 200	12 200	11 700	11 500	11 300	9 810	10 010	nat.data			
Lithuania	0	0	3 160	4 508	3 992	5 960	5 540	5 149	4 879	4 924	5 500	5 700	6 115	6 275	6 120	6 050	5 590	5 855	FAO			
Luxemburg											260	270	257	257	277	249	268	291	FAO			
Malta									0	0	0	0	0	0	0	0	0	0	FAO			
Netherlands	1 420	1 123	1 253	1 075	1 043	1 104	952	1 109	1 023	1 044	1 039	865	839	1 044	1 026	1 110	1 107	1 022	FAO			
Poland	17 617	17 026	18 778	18 590	18 776	20 350	20 286	21 731	23 107	24 268	26 025	25 016	27 137	30 836	32 733	31 945	32 384	35 935	FAO			
Portugal	**14 689**	**14 116**	**13 438**	**13 352**	**12 870**	**12 310**	**11 840**	**11 854**	**11 312**	**11 840**	**11 457**	**11 784**	**11 483**	**12 606**	**14 120**	**13 912**	**14 018**	**14 031**	**nat.data**	**11 780**	**11 744**	**nat.data**
Romania	12 608	12 961	12 440	8 840	11 925	12 178	12 250	13 529	11 649	12 704	13 148	12 424	15 154	15 440	15 809	14 501	13 970	15 341	FAO			
Slovakia				5 249	5 318	5 323	5 460	4 945	5 519	5 795	6 163	5 788	5 782	6 355	7 240	9 302	7 869	8 875	FAO			
Slovenia			1 671	1 065	1 944	1 866	1 991	2 208	2 133	2 068	2 253	2 257	2 283	2 591	2 551	2 733	3 179	2 882	FAO			
Spain	15 590	15 188	13 924	13 767	15 305	16 075	15 631	15 631	14 874	14 810	14 321	15 131	15 839	16 105	16 290	15 531	15 716	14 528	FAO			
Sweden	**66 000**	**64 000**	**66 000**	**67 000**	**69 000**	**78 000**	**70 000**	**74 000**	**75 000**	**72 000**	**78 000**	**78 000**	**82 000**	**83 000**	**87 000**	**122 000**	**80 000**	**97 000**	**nat.data**	**94 100**	**94 035**	**nat.data**
United Kingdom	**7 120**	**7 470**	**7 820**	**8 170**	**8 520**	**8 008**	**7 928**	**8 293**	**8 225**	**8 683**	**8 827**	**8 886**	**9 015**	**9 713**	**9 889**	**9 927**	**9 800**	**10 358**	**nat.data**	**12 423**	**13 178**	**nat.data**
EU-27 Total	**244 466**	**269 383**	**284 059**	**294 202**	**315 907**	**332 101**	**320 398**	**338 770**	**343 321**	**350 111**	**378 146**	**356 368**	**372 516**	**390 531**	**404 971**	**446 063**	**408 612**	**449 117**		**538 152**	**557 597**	

NOTES

FAO - data FAOSTAT; ForesSTAT

nat.data - data provided by member state

ne - not estimated

CARBON CHANGES IN THE HWP POOL

The data presented constitute estimates of net-emissions from harvested wood products (HWP) due to changes in the HWP carbon pool for EU MS. The methodology used was based on the 2006 IPCC Guidelines (IPCC 2006, Vol.4, Ch. 12) which estimates delayed net-emissions on the basis of the annual stock change of semi-finished HWP. Activity data (production and trade of semi-finished HWP) based on FAO/UNECE databases. For this work the data were derived from the UNECE Timber Database 2008 (time series 1964-2008), which provides data on the following HWPs.

- 1632 (5.C) Coniferous sawnwood
- 1633 (5.NC) Non-coniferous sawnwood
- 1634 (6.1) Veneer sheets
- 1640 (6.2) Plywood
- 1646 (6.3) Particle board (incl. OSB)
- 1647 (6.4.1) Hardboard
- 1648 (6.4.2) MDF
- 1649 (6.4.x) Fibreboard, compressed
- 1650 (6.4.3) Insulating board
- 1866 (1.2.C) Coniferous industrial roundwood
- 1867 (1.2.NC) Non-coniferous industrial roundwood
- 1876 (10) Paper and paperboard

The data were calculated using a Tier 1 level method (IPCC, 2006) using the proposed domestic production-based approaches which take into account a) domestically produced and consumed HWP from domestic harvest (Cowie, et al, 2006) and b) domestically produced HWP from domestic harvest[3][4] as described in document *FCCC/KP/AWG/2009/10/Add.3/Rev.2*. Only HWP in use were considered. Half-lives of 15 yrs for solid wood products (1632-1650) and 1 yr for paper products (1876) were assumed. Further analysis using longer half lives is underway.

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[3] NOTE: To simplify matters, the contribution of exported HWP to Parties' net-emissions is aggregated including all exported HWP of the respective commodities and is calculated by means of the same underlying assumptions as domestically produced and consumed HWP.

[4] Provided by Sebastian Rüter, vTI Germany and Kim Pingoud, VTT Finland.

Inflow to the HWP pool (commodity data) for the period prior to 1964 was based on country-specific 10-year means for the period 1964-1974.

Further explanation of the estimation methods is provided in the 2006 GL (IPCC 2006, Vol.4, Ch. 12), in Pingoud and Wagner (2006), and in the Annex below.

PROJECTIONS OF FUTURE NET-EMISSIONS FROM HWP

The projections on the development of net-emissions from the HWP pool are intended to estimate the potential scale of HWP accounting and illustrate the potential impact when applying the following proposed accounting options:

a) Absolute net-emissions due to stock change in the accounting period (CP2), discount factor 85%
b) Reference base year 1990 (1)
c) Reference base period 2001-2005 (2)
d) Reference base period 2008-2012 (CP1) (part of scenario)

The results are not final assumptions on the impact of HWP inclusion in a reference level (bar). For this purpose, projections undertaken close to a commitment period would decrease uncertainties about future consumption patterns and the development of Inflow to the HWP carbon pool respectively. The calculations of projections rely on historic values on production and trade of wood product commodities that have been submitted by Parties to UNECE Timber Section, Geneva, Switzerland (Timber Database 2008).

Two projections based on assumptions about future consumption patterns of wood products are included. In both cases, the projections were based on the respective average of last 5 years of accountable Inflow, starting from 2009. Projections are provided for both domestically produced (PA), and domestically produced and consumed HWP (SCAD).

a) Projection A assumes stable Inflow to the pool until 2020.
b) Projection B is based on the country-specific long term trend (period of 1990 – 2008) of pool Inflow.

Further description of methodologies and the potential impact of different accounting approaches at EU level is provided in the Annex below.

Under the Production approach, which includes exported goods, the stock change in the HWP pool, originating from wood produced in the EU-27 in 2006, was 58 $MtCO_2$. Since 1990 the HWP C stock-changes in the EU-27 have increased at an average annual rate of 2.2 $MtCO_2$.

Under the SCAD[5] approach, which excludes exported goods, the stock change in the HWP pool originating from the sum of the wood produced in the 27 Member States in 2006 was 14 $MtCO_2$. Since 1990 the HWP C stock-changes in the EU-27 have increased at an average annual rate of 295 $KtCO_2$. In the numbers presented, HWP traded between MS are treated as exports. Data for the EU total are not presented since it would require additional calculations.

The results constitute a first estimate of the accounting proposal as suggested by EU and are to be revised as soon as country specific information (data on half-lives, growth rates, etc.) is available.

[5] Stock change of domestically produced and consumed HWP (SCAD)

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Member State	half lives considered	Harvested Wood Products - Production Approach (1.000 tonCO_2eq)																	Projected		
		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Source	2015	2020	Source
Austria	30ySW/2yPP	-3 698	-2 105	-1 858	-1 414	-2 270	-2 795	-2 906	-3 114	-3 217	-2 519	-2 320	-3 111	-4 058	-4 720	-3 991	-4 012	-3 175		pingoud			
Belgium	30ySW/2yPP	-2 272	-2 261	-1 865	-1 482	-971	-1 263	-2 119	-1 458	-2 470	-1 264	-619	-97	-1 305	-1 727	-1 479	-1 171	-687		pingoud			
Bulgaria	30ySW/2yPP	-101	97	1 029	933	875	796	703	663	634	657	318	157	183	199	-199	-79	-28		pingoud			
Cyprus	30ySW/2yPP	-7	1	1	-11	-7	-6	-7	2	-4	-7	8	16	17	18	18	18	18		pingoud			
Czech Rep.	30ySW/2yPP	-1 377	-60	-221	-828	-1 325	-1 826	-2 088	-1 824	-1 296	-1 563	-1 694	-1 950	-1 856	-2 882	-2 768	-2 764	-3 577		pingoud			
Denmark	30ySW/2yPP	-376	-333	57	-68	18	91	8	251	416	516	166	51	699	616	700	408	504		pingoud			
Estonia	30ySW/2yPP	-249	-252	-255	-2 182	-781	-4 837	-1 436	-7 397	-6 781	-4 091	-3 516	-2 294	-2 173	-1 935	-1 905	-1 517	-1 399		pingoud			
Finland	30ySW/2yPP	-2 110	-181	-893	-3 212	-5 201	-3 253	-2 850	-6 179	-5 676	-5 314	-6 052	-2 627	-3 395	-3 924	-4 588	-266	-2 838		pingoud			
France	**15ySW/1yPP**	**-2 625**	**-2 353**	**-1 944**	**-256**	**-392**	**-181**	**-2 150**	**-2 571**	**-3 190**	**-343**	**-3 843**	**-353**	**-230**	**-1 617**	**-2 661**	**-2 222**	**-2 128**	**-179**	**rueter**			
Germany	**15ySW/1yPP**	**-616**	**-2 497**	**-2 888**	**-314**	**-6 548**	**-5 682**	**-5 580**	**-6 499**	**-5 817**	**-6 545**	**-9 552**	**-5 816**	**-8 256**	**-1 446**	**-1 417**	**-15 242**	**-16 483**	**-14 814**	**rueter**	**-8 985**	**-7 219**	**rueter**
Greece	30ySW/2yPP	-503	-543	-531	-926	-811	-664	-567	451	146	21	-186	31	-178	-188	-81	-150	-195		pingoud			
Hungary	30ySW/2yPP	-1 206	-428	-959	79	-185	-101	-306	-1 118	-715	-393	-524	-401	-506	-547	-139	-120	-336		pingoud			
Ireland	**15ySW/1yPP**	**-470**	**-447**	**-556**	**-588**	**-663**	**-541**	**-635**	**-645**	**-764**	**-82**	**-966**	**-945**	**-778**	**-981**	**-88**	**-899**	**-988**	**-114**	**rueter**	**-563**	**-452**	**rueter**
Italy	30ySW/2yPP	-1 027	-443	-296	-1 181	-390	-1 728	-2 184	-1 508	-1 642	-1 609	-451	159	180	-73	-225	-310	-757		pingoud			
Latvia	30ySW/2yPP	-474	-480	-486	-82	-1 556	-1 595	-1 498	-3 288	-4 261	-3 687	-4 568	-4 988	-5 004	-5 377	-5 422	-5 340	-5 741		pingoud			
Lithuania	30ySW/2yPP	-166	-168	-170	-558	-1 025	-1 184	-1 474	-1 225	-1 174	-1 087	-1 542	-1 504	-1 598	-1 777	-1 581	-1 448	-1 404		pingoud			
Luxembourg	30ySW/2yPP	-74	-73	-61	-42	-21	-25	-42	-27	-48	-41	-10	-33	-19	5	-212	-258	-255		pingoud			
Malta	30ySW/2yPP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		pingoud			
Netherlands	30ySW/2yPP	-2 113	-1 034	-949	-468	-734	120	61	-199	410	147	167	271	817	42	-3 692	1 978	1 067		pingoud			
Poland	30ySW/2yPP	921	1 121	31	-107	-1 807	-378	-459	-1 621	-2 601	-2 597	-3 180	-2 135	-2 935	-4 203	-5 045	-4 032	-4 935		pingoud			
Portugal	30ySW/2yPP	-1 793	-1 833	-1 311	-1 072	-1 193	-1 033	-1 022	-992	-645	-884	-1 149	-1 342	-1 393	-1 570	-1 448	-1 178	-1 340		pingoud			
Romania	30ySW/2yPP	584	1 416	1 100	953	1 955	1 722	1 771	1 582	1 329	628	90	305	-285	-1 065	-1 451	-1 066	-1 473		pingoud			
Slovakia	30ySW/2yPP	-501	-24	-81	385	-140	-90	-259	-552	-1 017	-1 378	-1 792	-726	-1 010	-1 131	-1 515	-2 660	-2 242		pingoud			
Slovenia	30ySW/2yPP	-286	-290	-293	-328	-265	-290	-223	-362	-496	-215	-312	-335	-563	-361	-307	-378	-474		pingoud			
Spain	30ySW/2yPP	-2 569	-2 641	-1 547	-2 303	-2 652	-3 101	-3 043	-3 063	-1 806	-3 738	-4 375	-4 951	-5 140	-4 655	-4 532	-3 817	-4 457		pingoud			
Sweden	**30ySW/2yPP**	**-2 620**	**-480**	**-590**	**-1 850**	**-2 000**	**-2 730**	**-2 550**	**-3 050**	**-1 950**	**-1 240**	**-2 580**	**-2 310**	**-2 510**	**-2 940**	**-2 960**	**-5 060**	**-4 510**	**-4 930**	**nat.data**	**-4 630**	**-3 955**	**nat.data**
United Kingdom	**15ySW/1yPP**	**-1 682**	**-1 416**	**-1 109**	**-1 003**	**-793**	**-1 041**	**-1 185**	**-1 365**	**-1 468**	**-1 513**	**-1 268**	**-834**	**-267**	**42**	**368**	**-140**	**-544**	**-1 293**	**nat.data**	**-4 193**	**-4 693**	**nat.data**
Sum of 27 MS		**-27 409**	**-17 709**	**-16 645**	**-17 921**	**-28 883**	**-31 613**	**-32 040**	**-45 109**	**-44 104**	**-38 140**	**-49 749**	**-35 760**	**-41 564**	**-42 197**	**-46 621**	**-51 724**	**-58 376**					
EU Total		**-27 409**	**-17 709**	**-16 645**	**-17 921**	**-28 883**	**-31 613**	**-32 040**	**-45 109**	**-44 104**	**-38 140**	**-49 749**	**-35 760**	**-41 564**	**-42 197**	**-46 621**	**-51 724**	**-58 376**					

Member State	half lives considered	Harvested Wood Products - SCAD Approach (1.000 tonCO_2eq)																		Projected		
		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Source	2015	2020	Source
Austria	30ySW/2yPP	-1 101	-581	-821	-874	-1 041	-622	-1 069	-1 019	-973	-377	-286	-919	-694	-654	-449	-747	-614		pingoud			
Belgium	30ySW/2yPP	45	19	149	205	464	250	-331	555	131	681	732	647	716	793	807	957	1 021		pingoud			
Bulgaria	30ySW/2yPP	32	161	1 112	938	858	818	879	884	704	1 059	775	575	695	692	633	1 043	1 037		pingoud			
Cyprus	30ySW/2yPP	2	8	12	-1	-1	-1	4	13	10	12	12	19	21	25	21	21	21		pingoud			
Czech Rep.	30ySW/2yPP	-1 345	416	237	101	432	316	286	426	508	584	352	315	130	-197	-101	56	-643		pingoud			
Denmark	30ySW/2yPP	12	32	274	-56	204	237	150	376	620	491	346	477	489	429	560	465	517		pingoud			
Estonia	30ySW/2yPP	-126	-128	-130	15	167	117	275	144	178	-30	-78	-264	-228	-370	-414	-303	-384		pingoud			
Finland	30ySW/2yPP	-1 065	43	-313	-161	-641	-474	-870	-1 721	-1 167	-1 330	-1 867	-948	-980	-1 344	-1 245	-478	-590		pingoud			
France	**15ySW/1yPP**	**-1 466**	**-1 112**	**-278**	**-620**	**-15**	**-845**	**-645**	**-630**	**-121**	**-836**	**-1 613**	**-1 354**	**185**	**730**	**-39**	**493**	**584**	**120**	**rueter**			
Germany	**15ySW/1yPP**	**-4 443**	**-1 568**	**-1 539**	**-148**	**-3 234**	**-239**	**-2 528**	**-3 169**	**-249**	**-3 673**	**-341**	**-584**	**-426**	**-247**	**-3 722**	**-48**	**-7 698**	**-4 343**	**rueter**	**-2 822**	**-2 270**	**rueter**
Greece	30ySW/2yPP	-326	-342	-134	-854	-779	-606	-515	604	263	142	-65	104	-105	-152	-122	-409	-502		pingoud			
Hungary	30ySW/2yPP	-472	15	34	331	184	373	407	-146	647	520	445	469	454	370	530	533	360		pingoud			
Ireland	**15ySW/1yPP**	**-29**	**-222**	**-29**	**-258**	**-343**	**-275**	**-344**	**-36**	**-37**	**-370**	**-56**	**-518**	**-172**	**-256**	**-332**	**-213**	**-293**	**-353**	**rueter**	**-160**	**-128**	**rueter**
Italy	30ySW/2yPP	-135	325	435	-143	468	-924	-1 349	-838	-1 027	-1 065	43	378	362	-161	-205	-431	-190		pingoud			
Latvia	30ySW/2yPP	-307	-311	-315	233	295	541	232	-45	-144	-304	-284	-374	-482	-168	-322	-556	-831		pingoud			
Lithuania	30ySW/2yPP	-112	-113	-115	-423	-238	11	-136	-54	-295	-199	-254	-244	-265	-261	-396	-407	-525		pingoud			
Luxembourg	30ySW/2yPP	24	54	47	31	29	25	22	24	19	24	20	19	2	13	13	27	6		pingoud			
Malta	30ySW/2yPP	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2		pingoud			
Netherlands	30ySW/2yPP	363	937	865	723	722	703	870	968	921	587	840	693	745	847	699	799	866		pingoud			
Poland	30ySW/2yPP	1 093	1 494	833	768	-500	461	100	-635	-1 296	-1 002	-1 284	-415	-627	-1 288	-2 050	-1 598	-2 798		pingoud			
Portugal	30ySW/2yPP	-83	-257	1	-314	-244	-340	-315	-220	-270	-495	-629	-749	-440	-207	-299	172	200		pingoud			
Romania	30ySW/2yPP	-360	508	225	-42	1 526	1 425	1 483	1 648	1 619	1 387	1 247	1 048	913	581	486	237	-49		pingoud			
Slovakia	30ySW/2yPP	-412	217	121	359	431	421	388	554	247	71	-151	249	343	67	-438	-1 062	-499		pingoud			
Slovenia	30ySW/2yPP	-33	-35	-37	-165	-97	-156	-195	-193	-274	-122	-183	-172	-347	-167	-91	-26	17		pingoud			
Spain	30ySW/2yPP	-2 223	-2 219	-1 144	-1 480	-2 025	-2 266	-2 482	-1 888	-513	-2 663	-3 160	-3 204	-3 429	-3 378	-3 678	-2 503	-2 940		pingoud			
Sweden	**30ySW/2yPP**	**-1 670**	**-320**	**680**	**1 360**	**1 300**	**-120**	**1 330**	**-30**	**740**	**1 020**	**-740**	**-910**	**-660**	**-750**	**70**	**-640**	**-60**	**-2 280**	**nat.data**	**-400**	**-320**	**nat.data**
United Kingdom																							
Sum of 27 MS		**-14 133**	**-2 975**	**173**	**-471**	**-2 074**	**-1 167**	**-4 349**	**-4 425**	**244**	**-5 884**	**-6 176**	**-5 660**	**-3 799**	**-5 052**	**-10 081**	**-4 615**	**-13 983**	**-6 856**				
EU Total		**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**				

ANNEX – COUNTRY NOTES

AUSTRIA

Historical Net-Removals (-) or Net-Emissions (+)

As indicated in the Austrian NIR 2009, the results of the national forest inventory by the Federal Research Centre for Forests (NFI, BFW 2008) serve as main basis for the estimates of forest biomass increment and drain. The Austrian NFI provides measured data for both, increment and drain. The latest NFI has been conducted in 2000 – 2002. For the following years, only mean values for biomass increment and drain, resulting on basis of the data from the latest NFI, have been reported. The whole time series will be officially revised after finalisation of the subsequent NFI.

In Austria another statistic for harvest exists, the so called „timber harvest reports", which are annually published by the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management according to the national forest law. Basis for these data are records and estimates of the forest owners on harvested wood. The recent „timber harvest reports" by the Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLUW 2009) give evidence that the harvest rates in the last years have increased substantially compared to the NFI 2000 – 2002. The increment remained stable during the last decades. This results in a reduction of the net sink compared to 2000 – 2002 data.

These data provide for an appropriate representation of the C- fluxes on 'forest land remaining forest land' for the most recent years on a conservative basis, as the timber harvest reports underestimate the total harvest rates compared to the estimates on biomass drain resulting from the NFI (see data comparison for 2000 – 2002).

LITERATURE:

BFW 2009: National Forest Inventory. Federal Research Centre for Forests, Vienna, information on the last NFIs can be downloaded at the website: http://bfw.ac.at/rz/bfwcms.web?dok=788

BMLFUW 2009: Holzeinschlagsmeldungen. Timber harvest reports by the Federal Ministry of Agriculture, Forestry, Environment and Water Management, Vienna, the reports of the last years can be downloaded at the website: http://gpool.lfrz.at/dev/cgi-bin/bizzzhoo2/main.cgi?catid=13733&rq=cat&tfqs=catt&catt=default

SCENARIOS FOR NET-REMOVALS AND NET-EMISSIONS, YEARS 2015 AND 2020

MODEL INFORMATION

PROGNAUS (PROGNosis for AUStria) (Ledermann 2006) is a yield and silvicultural science-based model, which was developed and applied in 1995 for the first time and is updated continuously. PROGNAUS consists of several sub-models, basically a basal area increment model (Monserud and Sterba 1996), a height increment model (Nachtmann 2006), a tree recruitment model (Ledermann 2002) and a model describing tree mortality (Monserud and Sterba 1999). The performance of PROGNAUS was tested in several studies (e.g. Sterba and Monserud 1997, Sterba et al. 2002). Furthermore, PROGNAUS was applied to evaluate different forest management regimes (Ledermann and Sterba 2006).

DATA SOURCE

According to the national inventory report, systematically measured statistics – such as the national forest inventory (NFI, BFW 2009) – are considered to have highest reliability in reporting forest area, land use changes from and to forests, stock, increment and drain (NIR, UBA 2009). The results of the latest NFI conducted in 2000 – 2002 therefore form the basis for the modelling of the Austrian forest carbon stock changes in the year 2015 and 2020.

DESCRIPTION

Special importance was attached to the silvicultural relevance of tending activities by means of intensive preliminary cuttings and thinnings. As final cutting such stands were declared, which had a negative growth of the economic value. Additionally to the silvicultural aspects, economic and ecological facts were considered in the calculations. The harvesting costs were estimated via different harvesting models and opposed to revenues gained from diverse price scenarios[6]. Harvests on inventory plots with a positive profit margin free of harvesting costs were up-scaled to the attainable harvesting potential. Ecological aspects were concerned in the harvesting potential insofar, as the selection of the harvesting method and the parts of the trees to be harvested were determined. The results were converted into cubic metres of stem wood over bark (m^3 o.b.) on the basis of the timber assortment classifications, and finally translated into Gg C of whole tree biomass – for the years 2015 and 2020.

Due to the kind of projected harvesting activities, it is assumed that an increase of the harvesting intensity due to higher prices does not cause changes in increment, which according to the latest NFI's remained quite stable during the last decades. An increase in prices mainly leads to additional preliminary cuttings of the smaller dimensions in stands.

[6] 71 €: average biomass price in 2004-2006; 81 €: biomass price end of 2006; 100 €: assumption on moderate increase in biomass prices compared to 2004-2006; 162 €: assumption of doubling of biomass price (same development as oil price in period 1985-2005).

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UBA 2009: Austrias National Inventory Report. Umweltbundesamt, Vienna, information can be downloaded at the website: http://www.umweltbundesamt.at/umweltschutz/luft/emiberichte/

ROUNDWOOD PRODUCTION

Source: national data

DENMARK:

Forest data – Article 3.3 activities (Afforestation, Reforestation, Deforestation) and Article 3.4 Forest management

GENERAL INPUT DATA - FOREST AREA, HARVESTING AND AREA AFFECTED BY NATURAL DISTURBANCES.

FOREST AREA

Data sources:

1. National Forest Inventory - NFI - conducted by Forest and Landscape Denmark for The Danish Forest and Nature Agency, Ministry of Environment. The NFI started in 2002 and is a continuous forest inventory with partial replacement of sample plots. The rotation is 5 years (Nord-Larsen et al 2008).

2. Forest Census 1990 and 2000, conducted by Statistics Denmark - in cooperation with The Danish Forest and Nature Agency and Forest and Landscape Denmark. (Danmarks Statistik 1994, Larsen & Johannsen 2002)

3. Mapping of the forest area based on satellite images in 1990 and 2005, with support from ESA - GMES - FM and the Ministry of Climate and Energy. (Prins 2009)

CARBON STOCK 1990 - 2007

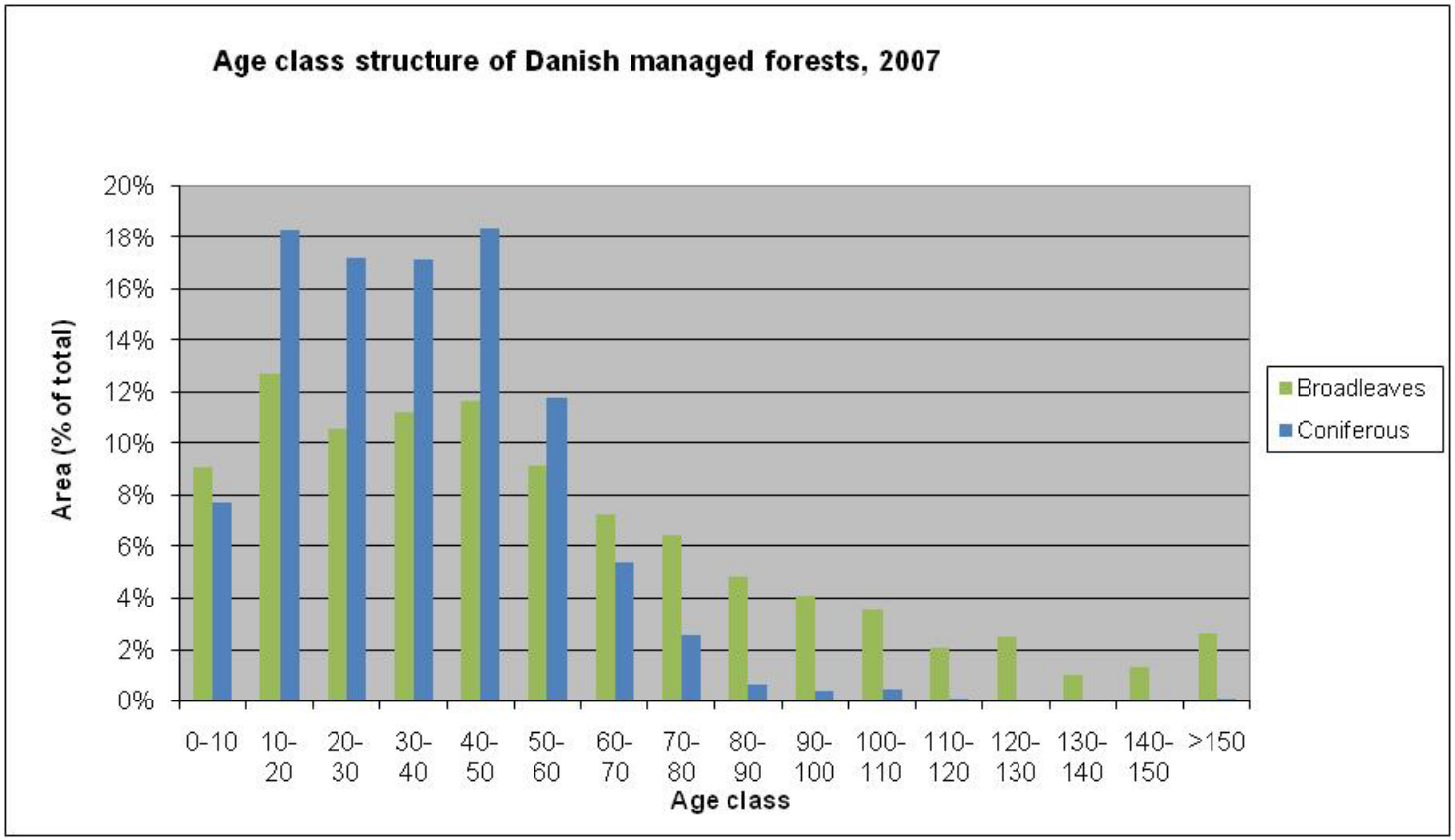
Based on the mapped forest area in 1990 and 2005, carbon stocks in 2005-2007 in forest established before 1990 (under the Kyoto Protocol Article 3.4) and afforestation since 1990 (under the Kyoto Protocol Article 3.3) were estimated. The forest areas in 1990 as well as in 2005 have been mapped to be larger than previously estimated for the times.

The calculation of carbon stocks in 1990 and 2000 was based on the species and age class distribution reported in the forest census 1990 and 2000 and the satellite image forest mapping. Total carbon stocks were estimated using the average carbon pools in different species and age classes observed in the NFI (2003-2007) and under the assumption that average carbon pools per hectare are unchanged since 1990. For each of the years 1990 - 2000 calculated a standing carbon stock as a moving average, corrected for the small scale deforestation which was detected.

Since the NFI was initiated in 2002, the first full-rotation estimates are representative for 2005. Calculation of carbon stock in the period 2000-2004 is based on NFI estimates for 2005 and carbon stock as calculated for 2000. For 2005-2007 carbon stock is calculated solely on the basis of the NFI - with additional information about the total forest area from satellite image mapping.

AGE CLASS STRUCTURE

Age class structure is based on distribution of forest area to management classes.



HARVESTING

No estimations are made for the harvesting, as the stock change approach is implemented.

NATURAL DISTURBANCES

Historic national disturbances have affected the carbon stock of the Danish forests, but not the area as all areas have been regenerated or replanted with forest. No estimations or predictions are made for natural disturbances and effects on carbon stocks for the period 2008 - 2020.

FOREST EMISSIONS AND REMOVALS DATA

The prognosis for carbon stock during the period 2008 - 2020 is based on the NFI data on carbon stock in management classes - species and age classes. Forecasts are based on are allocation to age classes based on probabilities for rejuvenation of each management class. It assumes a constant distribution of species (no species change), but a calculation of percentage of area rejuvenated each year with the same species. For each year, these calculations are combined with NFI data for carbon stocks in each management class. Evolution of the total carbon pool can then be calculated. The probabilities for rejuvenation is estimated based on the forest census data from 1990 and 2000 (Nord-Larsen & Heding 2002). The projections involve no estimation of growth or harvesting.

The projections are performed similarly for old as well as new forests. In the afforestation an annual afforestation of 1900 ha is assumed, with a species distribution similar to the distribution observed in the NFI, except for a constant area with Christmas trees.

The forecast for the period 2008 - 2020 show a decreasing trend of forest carbon stock. This is due to the current high proportion of old trees, which face rejuvenation. Hereby large old trees felled and replaced by new small trees. The net result is that the total carbon stock decreases. If the forests had a completely even distribution of ages, carbon stock would be virtually constant - assuming unchanged harvesting and growth. Changes in forest management, may affect the development of forests. Thus, a postponement of cutting of old trees - will postpone the decline in carbon storage. Conversely, increased logging (e.g. due to increased demand, increased price or similar) may lead to a sharper decline in carbon stock.

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Variable	Activity	unit	Denmark Historic																		Projected		
			1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Source	2015	2020	Source
General Input data																								
Forest Area	FM	1.000ha	555	555	555	555	555	555	555	555	555	555	555	555	555	554	553	553	553	553		553	553	
	AR	1.000ha	0	2	4	7	9	11	13	16	18	20	22	26	29	32	36	39	45	49		63	73	
	D	1.000ha	0	0	0	0	0	0	0,3	0	0	0	0	0	0	0,9	0,6	0	0	0		0	0	
	Total	1.000ha	555	557	559	562	564	566	568	570	572	575	577	580	584	585	588	592	598	602		616	626	
Harvesting	FM	1.000m^3ob																						
	AR	1.000m3ob																						
	D	1.000m3ob																						
	Total	1.000m3ob																						
Natural Disturbances data																								
Area Affected by Forest Fires	FM	1.000ha																						
	AR	1.000ha																						
	D	1.000ha																						
	Total	1.000ha	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
Area Affected by Storms	FM	1.000ha																						
	AR	1.000ha																						
	D	1.000ha																						
	Total	1.000ha	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	15	0	0		0	0	
Area Affected by Other Disturbance	FM	1.000ha																						
	AR	1.000ha																						
	D	1.000ha																						
	Total	1.000ha	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
Forest emissions and removals data																								
Living Biomass Gains	FM	1.000t CO_2eq																						
	AR	1.000t CO2eq																						
	D	1.000t CO2eq																						
	Total	1.000t CO2eq																						
Emissions (+) from harvesting	FM	1.000t CO2eq																						
	AR	1.000t CO2eq																						
	D	1.000t CO2eq																						
	Total	1.000t CO2eq																						
Emissions (+) from natural disturbances	FM	1.000t CO2eq																						
	AR	1.000t CO2eq																						
	D	1.000t CO2eq																						
	Total	1.000t CO2eq																						
All other net emissions (incl. other pools)	FM	1.000t CO2eq																						
	AR	1.000t CO2eq																						
	D	1.000t CO2eq																						
	Total	1.000t CO2eq																						
Net-emissions without HWP	FM	1.000t CO2eq	-932	-932	-932	-932	-932	-721	-932	-932	-932	-932	-679	-679	-46	-277	-677	-677	-750	596		251	416	
	AR	1.000t CO2eq	-51	-51	-51	-51	-51	-51	-51	-51	-51	-51	-138	-138	-136	-136	-137	-137	-326	132		-208	-359	
	D	1.000t CO2eq	0	0	0	0	0	212	0	0	0	0	0	0	632	401	0	0	0	0		0	0	
	Total	1.000t CO2eq	-984	-984	-984	-984	-984	-560	-983	-983	-983	-983	-816	-816	450	-12	-814	-814	-1 076	728		43	58	

Article 3.4 – Cropland management

AREA UNDER CROPLAND MANAGEMENT

The historical Danish data for the area for Cropland management are taken from Statistics Denmark annual surveys. The data has a very low uncertainty. The basic for the projection is based on the assumption that the agricultural area has been reduced constantly over the last 20 years due to urbanisation, afforestation and reestablishment of wetlands on cropland. The Danish government has launched a action plan, Grøn Vækst (Green Growth, http://www.mim.dk/Nyheder/Temaer/Groen_vaekst/) which will establish up to 75.000 ha natural habitats. It is unclear if this area will be reduction of the current agricultural area to the same extend. Therefore has a conservative approach been taken in estimates for 2015 and 2020.

NET EMISSIONS FROM CROPLAND MANAGEMENT

The Danish net emission is taken from the Danish submission to UNFCCC. As described above is it expected a slightly decline in the agricultural area. This may reduce the emission in the future. No major changes in how the agricultural soils are managed is expected, as it is difficult to increase the area with green catch crops in the autumn and grass in rotation further. However, the abandon of the set-a-side rules has increased the agricultural area and changed the emission profile for the Danish agriculture. The overall impact is uncertain and in combination with a very high uncertainty in the modelled emission estimates, as these are based on the actual temperatures, the projected emission in 2015 and 2020 will be in line with the current annual emission.

Article 3.4 – Grazing land management

AREA UNDER GRAZING LAND MANAGEMENT

See Cropland management. As no further changes are expected the projected area is expected to have a small decrease.

NET EMISSIONS FROM GRAZING LAND MANAGEMENT

See Cropland management. The expected effect of the "Grøn Vækst" initiative will be that part of the re-established natural habitats will be taken from the area with Grazing land (permanent grassland). A slightly decrease in the emission is therefore expected compared to the current emission.

Variable	Activity	unit	Denmark Historic																			Projected		
			1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Source	2015	2020	Source
General Input data																								
Area under Cropland management	Total	1.000ha	2563	2550	2539	2533	2426	2511	2515	2517	2508	2477	2473	2493	2480	2472	2465	2506	2513	2458	Statistics Denmark	2446	2386	nat. data
Area under Grazing land management	Total	1.000ha	217	212	208	197	191	207	193	168	156	160	166	174	178	178	173	193	189	197	Statistics Denmark	178	178	nat. data
Net emissions data																								
Cropland management	Total	1.000t CO2eq	3 287	1 228	1 361	1 970	1 402	1 233	1 768	1 909	1 297	2 016	2 227	2 713	1 779	1 191	2 580	1 888	1 841	1 779	Reported to UNFCCC	1 800	1 800	nat.data
Grazing land management	Total	1.000t CO2eq	93	91	89	84	82	89	82	72	67	68	71	74	76	76	74	83	81	84	Reported to UNFCCC	80	80	nat.data

FINLAND:

Forest data – Article 3.3 activities (Afforestation, Reforestation, Deforestation) and Article 3.4 Forest management

GENERAL INPUT DATA - FOREST AREA, HARVESTING AND AREA AFFECTED BY NATURAL DISTURBANCES.

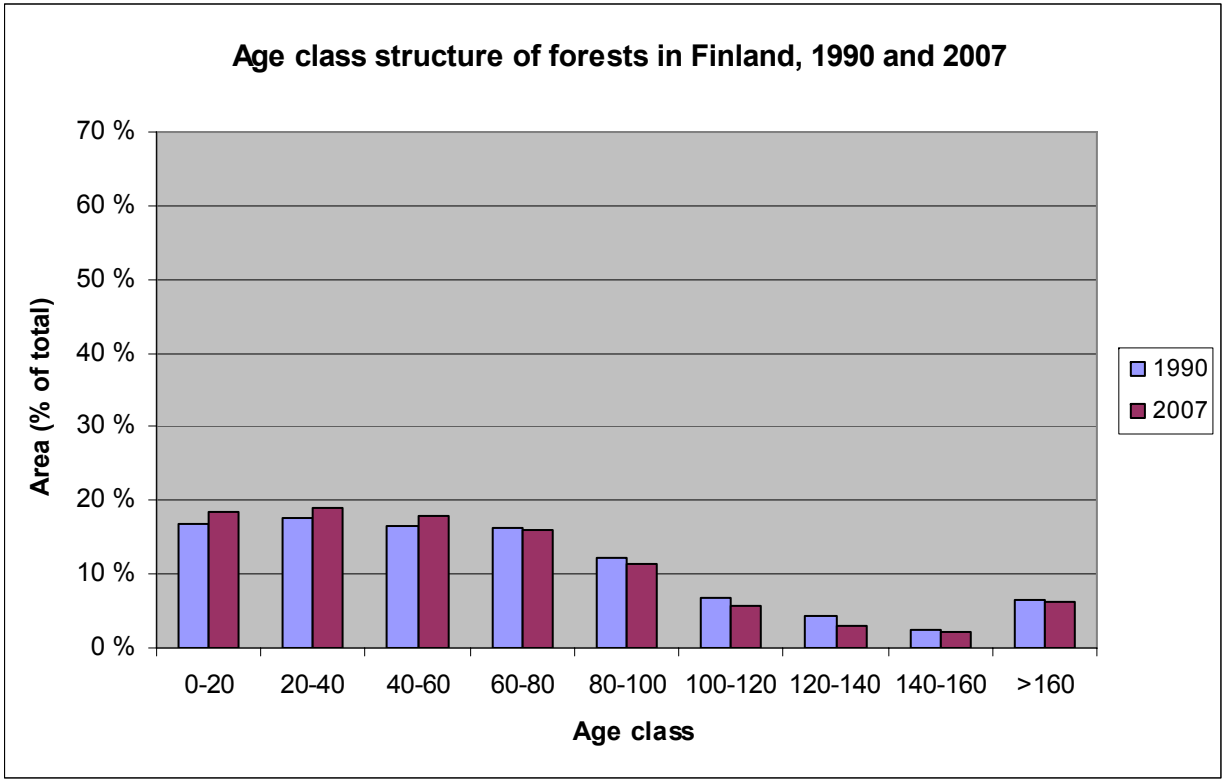
FOREST AREA

Total forest area data comes from the information submitted to the UNFCCC in 2009 and reported under the category "Total Forest Land" / "Forest Land Remaining Forest Land". The forest area is not the same as reported to FAO for the Global Forest Resource Assessment (table FAO forest area) due to the difference between methods how time series for forest land area is estimated even the same data source has applied.

Areas for Afforested /Reforested and Deforested lands are compiled from different data sources. For this reason the time series for total forest area and A/R and D areas are not consistent. The area presented on Afforested/Reforested and Deforested lands are cumulative. The area for Forest management, as well the emissions and removals, are calculated as a difference between area/removals in Forest land and A/R lands and difference in emissions between Forest land and deforested lands. The area and emission estimation for the UNFCCC reporting under the Kyoto Protocol is not yet completed. New estimates are currently prepared and will be available soon.

AGE CLASS STRUCTURE

Age class structure of forests is estimated for 1990 from the 8th National forest inventory data (1986-1994) and for 2007 from the 10th forest inventory data (2004-2008). All forest lands are included.



HARVESTING

The country historic data Finland provided on harvesting is not only the volume of the harvested timber but it includes also the harvesting losses and unrecovered natural losses.

NATURAL DISTURBANCES

Yearly data for "Area affected by Forest Fires" and "UNECE nat.dist. Fire" come from the official statistics of Finland, Finnish Statistical Yearbook of Forestry, compiled by Finnish Forest Research Institute.

Data for "Area affected by storms" includes damage by storm, wind and snow. "Area affected by other disturbances" includes damage by insects, diseases, moose and rodents. Figures are taken from the Forest Resources Assessment FRA 2010 Country Report, Finland. The figures for the reporting years refer to the averages of annually affected areas for the 5-year periods 1988-92, 1998-2002, and 2003-2007, respectively. Only serious and complete damage during the past 5 years before the inventory are included.

"Emissions (+) from natural disturbances" contains emissions from forest fires only. Emissions from storms are included in the emissions from harvesting. Other emissions are not estimated.

FOREST EMISSIONS AND REMOVALS DATA

The projected net removal in forests is estimated to be at least 10 mill. t CO2 eq. This target level is set in the Finland's National Forest Programme 2015 (KMO2015). Several scenarios with different assumptions and expectations in timber trade, markets and prices and their effects on the harvesting volumes and volume and increment of the growing stock were simulated. The ceasing import of round wood is one of the most important underlying assumptions. The minimum target level is set on the bases of these scenarios.

For the 2010 submission to the UNFCCC, Finland will do several improvements into the LULUCF reporting, not only for the Kyoto Protocol reporting. New estimates will be with lower uncertainties. The area estimation is renewed, national biomass models are implemented, as well a new version of the soil model. All these changes might have significant impacts on emission and removal estimates. This updated ghg inventory accounting system is likely to increase the emissions from forest soils significantly and hence reduce the removals in forest land. According to the latest research, the warm weather since 2000 may change some soil types from net sink to net sources and further increase emissions from other soil types.

HARVESTING WOOD PRODUCTS STOCK CHANGE DATA.

Projections on HWP are very dependant on underlying assumptions. It is anticipated that recession will reduce the input for the HWP pool.

Variable	Activity	unit	Finland Historic																			Projected		
			1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Source	2015	2020	Source
General Input data																								
Forest Area	FM	1.000ha	21 759	21 805	21 844	21 882	21 929	21 981	22 028	22 078	22 130	22 191	22 244	22 282	22 302	22 290	22 186	22 081	21 977	21 872	UNFCCC/nat.data			
	AR	1.000ha	11	24	43	63	74	80	92	104	113	122	130	139	144	148	153	157	162	167	nat.data			
	D	1.000ha	10	19	28	41	61	72	84	96	109	121	136	154	173	191	214	230	242	254	nat.data			
	Total	1.000ha																						
Harvesting	FM	1.000m^3ob	54 558	44 167	50 413	52 928	60 162	62 841	58 235	65 056	68 510	68 648	68 862	66 357	67 286	68 490	68 158	66 127	64 671	72 225	UNFCCC/nat.data			
	AR	1.000m3ob																						
	D	1.000m3ob	542	473	557	862	1 488	759	765	744	870	732	1 111	1 364	1 425	1 406	1 776	1 199	705	707	nat.data			
	Total	1.000m3ob	55 100	44 640	50 970	53 790	61 650	63 600	59 000	65 800	69 380	69 380	69 973	67 721	68 711	69 896	69 934	67 326	65 376	72 932	nat.data			
Natural Disturbances data																								
Area Affected by Forest Fires	FM	1.000ha																						
	AR	1.000ha																						
	D	1.000ha																						
	Total	1.000ha	0,4	0,2	1,1	0,0	0,8	0,5	0,4	1,1	0,1	0,6	0,3	0,2	0,6	0,7	0,4	0,5	1,6	0,6	UNFCCC 2009			
Area Affected by Storms	FM	1.000ha																						
	AR	1.000ha																						
	D	1.000ha																						
	Total	1.000ha	10,2										1,8					5,5			FRA2010			
Area Affected by Other Disturbance	FM	1.000ha																						
	AR	1.000ha																						
	D	1.000ha																						
	Total	1.000ha	13,8										8,4					7,9			FRA2010			
Forest emissions and removals data																								
Living Biomass Gains	FM	1.000t CO_2eq	-98 490	-99 637	-100 776	-101 888	-102 997	-104 198	-105 418	-106 750	-108 365	-110 139	-112 274	-114 461	-116 567	-118 679	-120 679	-122 678	-124 677	-126 675	UNFCCC/nat.data			
	AR	1.000t CO2eq	0	-42	-93	-171	-252	-296	-320	-365	-411	-448	-483	-516	-549	-568	-584	-602	-619	-637	nat.data			
	D	1.000t CO2eq																						
	Total	1.000t CO2eq	-98 490	-99 679	-100 869	-102 059	-103 248	-104 493	-105 738	-107 115	-108 776	-110 587	-112 757	-114 977	-117 116	-119 247	-121 263	-123 279	-125 296	-127 312	UNFCCC 2009			
Emissions (+) from harvesting	FM	1.000t CO2eq	71 432	58 008	65 929	69 297	78 614	82 137	75 971	84 962	89 290	89 493	89 692	86 455	87 614	89 081	88 710	86 201	84 144	93 729	UNFCCC/nat.data			
	AR	1.000t CO2eq																						
	D	1.000t CO2eq	709	621	728	1 129	1 944	992	998	972	1 134	954	1 448	1 777	1 855	1 829	2 311	1 562	918	918	nat.data			
	Total	1.000t CO2eq	72 141	58 630	66 657	70 425	80 557	83 129	76 969	85 934	90 424	90 447	91 139	88 231	89 469	90 910	91 021	87 764	85 062	94 646	UNFCCC 2009			
Emissions (+) from natural disturbances	FM	1.000t CO2eq																						
	AR	1.000t CO2eq																						
	D	1.000t CO2eq																						
	Total	1.000t CO2eq	4	2	10	0	8	5	5	11	1	6	4	2	6	7	4	5	15	6	UNFCCC 2009			
All other net emissions (incl. other pools)	FM	1.000t CO2eq	3 125	3 317	2 632	1 479	-306	-1 952	-3 606	-4 069	-4 290	-4 756	-4 419	-3 665	-2 906	-1 855	-924	-1 259	-902	-593	UNFCCC/nat.data			
	AR	1.000t CO2eq	0	27	59	108	158	186	202	231	261	285	309	332	355	370	383	397	410	424	nat.data			
	D	1.000t CO2eq	352	340	379	507	776	588	615	638	712	697	864	1 012	1 108	1 177	1 387	1 278	1 132	1 151	nat.data			
	Total	1.000t CO2eq	3 477	3 684	3 070	2 094	628	-1 177	-2 789	-3 200	-3 317	-3 774	-3 246	-2 321	-1 442	-308	846	415	640	983	UNFCCC/nat.data			
Net-emissions without HWP	FM	1.000t CO2eq	-23 933	-38 311	-32 215	-31 112	-24 689	-24 012	-33 053	-25 857	-23 365	-25 402	-27 002	-31 671	-31 859	-31 452	-32 893	-37 736	-41 435	-33 540				
	AR	1.000t CO2eq	0	-16	-34	-63	-94	-110	-118	-134	-150	-163	-174	-184	-194	-198	-201	-205	-209	-213				
	D	1.000t CO2eq	1 062	961	1 107	1 636	2 720	1 580	1 613	1 609	1 846	1 651	2 312	2 789	2 964	3 006	3 698	2 841	2 050	2 069				
	Total	1.000t CO2eq	-22 867	-37 363	-31 132	-29 539	-22 056	-22 536	-31 553	-24 370	-21 668	-23 908	-24 861	-29 065	-29 084	-28 638	-29 393	-35 096	-39 579	-31 678		-10000	-10000	KMO2015
Harvested wood products stock-change data																								
Stock-changes in HWP (SCAD)	FM	1.000t CO_2eq																						
	AR	1.000t CO2eq																						
	D	1.000t CO2eq																						
	Total	1.000t CO2eq	-1 065	43	-313	-161	-641	-474	-870	-1 721	-1 167	-1 330	-1 867	-948	-980	-1 344	-1 245	-478	-590		pingoud			
Stock-changes in HWP (PA)	FM	1.000t CO2eq																						
	AR	1.000t CO2eq																						
	D	1.000t CO2eq																						
	Total	1.000t CO2eq	-2 110	-181	-893	-3 212	-5 201	-3 253	-2 850	-6 179	-5 676	-5 314	-6 052	-2 627	-3 395	-3 924	-4 588	-266	-2 838		pingoud			
Forest emissions and removals including harvested wood products data																								
Net-emissions with SCAD HWP	FM	1.000t CO_2eq																						
	AR	1.000t CO2eq																						
	D	1.000t CO2eq																						
	Total	1.000t CO2eq	-23 932	-37 321	-31 445	-29 700	-22 696	-23 010	-32 423	-26 091	-22 834	-25 238	-26 727	-30 013	-30 063	-29 982	-30 638	-35 574	-40 169					
Net-emissions with PA HWP	FM	1.000t CO2eq																						
	AR	1.000t CO2eq																						
	D	1.000t CO2eq																						
	Total	1.000t CO2eq	-24 977	-37 544	-32 025	-32 751	-27 257	-25 789	-34 404	-30 550	-27 343	-29 223	-30 912	-31 692	-32 478	-32 561	-33 981	-35 362	-42 416					

FRANCE

French overseas territories

French overseas territories (New Caledonia, French Polynesia, Mayotte island, Wallis et Futuna islands, St Pierre et Miquelon islands, French Austral and Antarctic territories) are included in the UNFCCC reporting framework but not in the Kyoto Protocol accounting framework. Due to a lack of data, emissions by sources and removals by sinks from the LULUCF sector in these overseas territories are currently considered to be zero. Discussions are on-going between the French Government and these overseas territories to determine whether they could be fully included in the post-2012 regime.

	Forest area					
	1990	2000	2005	1000 ha/a	%/a	Source
Metropolitan area	14.538	15.351	15.554	68	+0.5	GFRA2005
French Guiana*	8.176	8.127	8.103	-5	-0.1	GFRA2005
Martinique island*	0.047	0.041	0.038	-1	-1.3	GFRA2005
Guadeloupe island*	0.071	0.066	0.063	-1	-0.8	GFRA2005
Réunion island*	0.104	0.101	0.099	0	-0.3	GFRA2005
New Caledonia**	nd	nd	0.717	nd	nd	GFRA2005
French Polynesia**	nd	nd	0.105	nd	nd	GFRA2005
Mayotte island**	nd	nd	0.005	nd	nd	GFRA2005
Wallis et Futuna islands**	nd	nd	0.005	nd	nd	GFRA2005
St Pierre et Miquelon islands**	nd	nd	0.003	nd	nd	GFRA2005
TOTAL (excluding overseas territories)	22.936	23.686	23.857	61	+0.3	
TOTAL (including overseas territories)	nd	nd	24.692	nd	nd	

*"Département d'outre-mer", overseas departments: status equivalent to metropolitan Départements. They are therefore included in the UNFCCC reporting and Kyoto Protocol accounting frameworks.; ** "Collectivités et Territoires d'outre-mer", overseas territories : They have a certain level of autonomy. Currently, they are included in the UNFCCC reporting framework but not in the Kyoto Protocol accounting framework.

FRENCH GUIANA

In French Guiana, only the costal area (around 1,5 millions hectares upon 8 in total) is considered "managed forest" for the 1st CP. The remaining part of the forest is considered unmanaged (see "assigned amount report submitted in 2006 to the European Commission according to the article 8 d), paragraph 1, of the decision n°280/2004/CE"). The UNFCCC reporting includes the costal area, using the conservative hypothesis that the forest is at equilibrium and is therefore reported as zero.

France passed a legislation last year to expand the Forest Code to the whole forest of French Guiana. As a consequence, consideration is being given to implement forest management accounting for the whole forest of French Guiana. In that case, in the absence of further data, removals by sinks will be considered to be zero, while emissions by sources (harvest) will be accounted for.

DEFORESTATION

Emissions from deforestation are reported and accounted for in the whole Kyoto perimeter: metropolitan area + the 4 overseas Departement: Reunion island, Martinique island, Guadeloupe island and French Guiana. Current data on deforestation from 1990 to 2007 took into account metropolitan area (annual national forest inventories) and French Guiana (UNFCCC reporting and Kyoto format voluntary reporting done in 2008: emissions from deforestation from 1990 to 2006 estimated using satellite remote sensing and a biomass assessment. Relevant documents will soon be posted on the UNFCCC REDD website). Data for the 3 other overseas Departement were based on experts saying. In 2008, 1990 to 2006 data on emissions from deforestation in these 3 departements were refined using satellite remote sensing and airborne imageries and specific biomass assessments. Relevant documents will also soon be posted on the UNFCCC REDD website.

DEFORESTATION, AFFORESTATION AND REFORESTATION

Please note that data provided for GHG emissions and removals for deforestation, afforestation and reforestation, from 1990 to 2007, are convention data. For this reason, GHG emissions and removals are not starting close to zero in 1990.

Storms, wind, snow

Here are data to be submitted soon to FAO/GFRA2010:

Year	Loss (Mm3)	Surface (1,000 ha)	Source
1990	9	n.d.	French national research centre on agriculture
1996	1,5	n.d.	French national research centre on agriculture
1999[1]	176	1 146	French National Forest inventory
2007[2]	0,2	n.d.	French state forest agency
2009[3]	48	680	French National Forest inventory

(1) Lothar and Martin; (2) Kyrill; (3) Klaus

INSECTS AND DISEASES

Since 1990, major outbreaks are the following:

- Ips typographus on Picea excelsia caused the loss of 0,75 Mm3 (around 3 000 ha) from 1990 to 1997 (stands weakened after several droughts) and another loss of 3.50 Mm3 (around 14 000 ha) from 2000 to 2006 (stands weakened after the storms of 1999);
- Ips sexandatus on Pinus pinaster caused the loss of 1.20 Mm3 (around 5 000 ha) from 2000 to 2006 (stands weakened after the storms of 1999);
- Rust (Melampsora larici-populina) on Poplar (cultivar Luisa Avanzo and cultivar Beaupré) caused the loss of around 30 000 ha.

In total, and taking into account other insects outbreaks and diseases, roughly 55 000 ha were damaged from 1990 to 2006.

It is worth to be noted that losses of production due to the defoliation of hardwood species in metropolitan area or due to hydric stress in temperate or tropical forest have major impacts on France's forest sink. For instance, the following events can be quoted:

- Diseases, due mainly to hydric stress, affected around 10 000 ha of Quercus robur from 1990 to now;
- The 2005 drought is estimated to have caused a decrease of around 5 GteqCO2 of the sink in the Amazon forest (article published the 6th of March 2009 by the University of Leeds in Science). French Guiana representing around 1,4% of the Amazon forest (8,1 Mha upon 600 Mha), 70 mteqCO2 is a rough estimate of the loss of the sink in French Guiana in 2005.

FOREST FIRES

Data on forest fires was gathered by the Statistics department of the French Ministry of agriculture and fisheries from 1990 to 2006 and by the French national forest inventory from 2007 to now. The following data show that there is a poor correlation between surface burnt and the number of forest fires:

Year	Surface (ha)	Number of forest fires
1990	76 625	nd
1991	10 129	nd
1992	16 607	4 008
1993	16 695	4 765
1994	24 996	4 635
1995	18 119	6 545
1996	11 399	6 401
1997	21 582	8 005
1998	19 282	6 289
1999	15 906	4 960
2000	24 078	4 603
2001	20 642	4 309
2002	30 162	4 097
2003	73 278	7 023
2004	13 710	3 767
2005	22 400	5 500
2006	7 850	4 608
2007	8 751	3 382
2008	6 001	2 781
Total	**351 458**	**> 85 678**

Treatment of data is underway to desaggregate total burnt areas between forest area and non-forest area (shrublands like ‘’maquis’’ or ‘’garrigues)’, with the aim to submit it in advance of Copenhagen.

HARVESTED WOOD PRODUCT

A voluntary reporting of carbon stored in HWP in France was done for the 2006 national GHG inventory.The methodology used in the study was consistent with chapter 12 of the 2006 IPCC guidelines for National Greenhouse Gas inventories dealing with harvested wood products. The method used corresponded to Tier 3, as both method and data used were country specific. The five HWP variables were calculated allowing the three approaches proposed by the IPCC (stock change, production and atmospheric flow) to be tested.

The study analysed five stocks or pools of carbon downstream of the forest in the wood chain and the paper sector : the productive system was analyzed (wood construction, wood furniture, wood packaging, wood energy, pulp and paper). The variation of carbon stored in landfill was also calculated. The stocks were identified (intermediate technical stocks and final in service stocks), and then quantified. Sensitivity analyses have been performed on the lifetime of long-lived products. All five sectors were analyzed through monographs and statistical data on physical fluxes of products. Storage duration for each stock was evaluated as robustly as possible, on the basis of direct information, enquiries, and economical and technical assessments.

GERMANY:

Forest data – Article 3.3 activities (Afforestation, Reforestation, Deforestation) and Article 3.4 Forest management

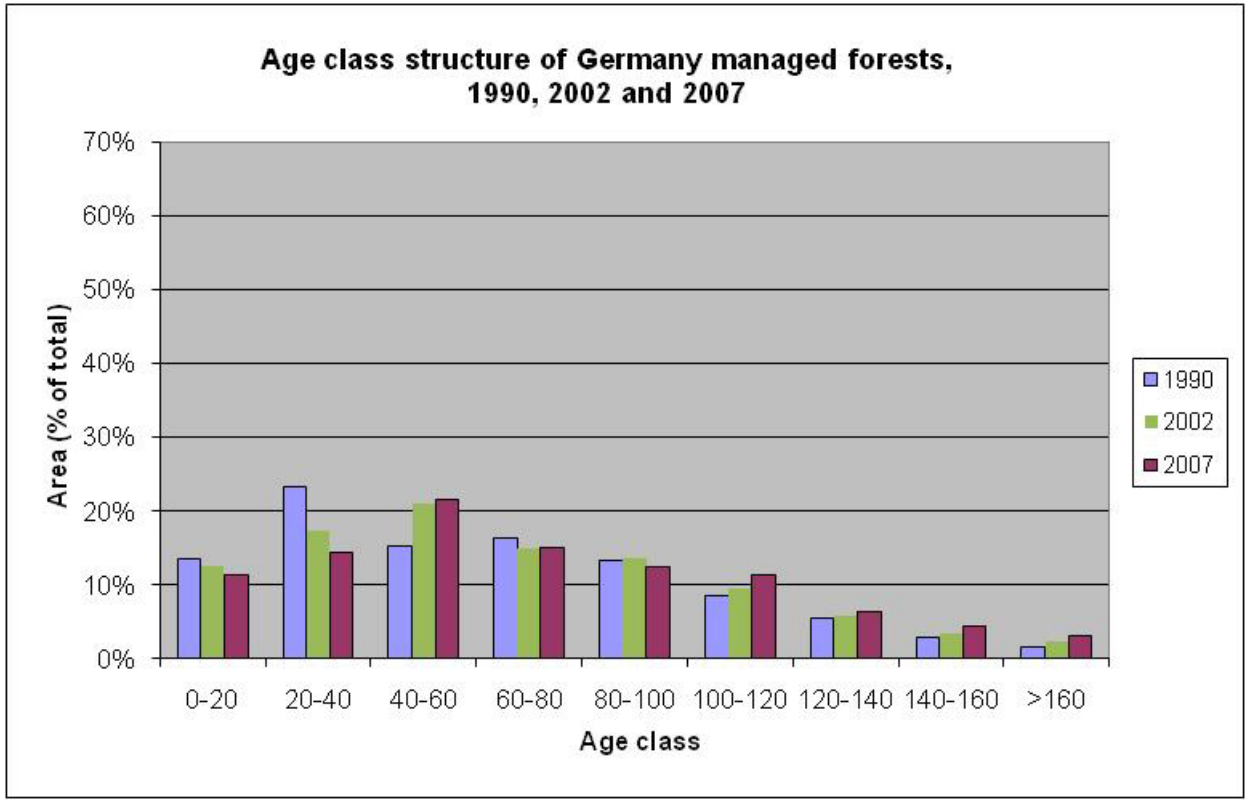
GENERAL INPUT DATA - FOREST AREA, HARVESTING AND AREA AFFECTED BY NATURAL DISTURBANCES.

FOREST AREA

Historical data is extracted from the last inventory submission to the UNFCCC. Methodology is described in NIR. There are actually no reliable projections on forest area development available, but as shown in historical time series, forest area in Germany can be considered as very stable, no remarkable changes are expected.

AGE CLASS STRUCTURE

Data are derived from national forest inventories (NFI), which are statistical forest inventories (methods described in www.bundeswaldinventur.de). There were actually three datasets from first and second inventory cycle (1987, 2002) as well as from an additional subsample (Inventorystudy, 2008) available. While the first inventory cycle is only covering the former FRG (western Part of Germany), second cycle and the subsample is covering the whole country, where the subsample is based on approximately 6700 of the 50000 forest plots of the full NFI grid. Age class structure is mainly characterised by the influence of second world war and the following years with huge clearcuts and subsequent replantings. This leads to an uneven age class distribution which develops further over time and influences possible timber use as well as gains in carbon storage mainly in biomass pools and further on also emissions trends.



HARVESTING

Data is derived from BORMANN et. al., 2006: „Die Waldgesamtrechnung als Teil einer integrierten ökologischen und ökonomischen Berichterstattung“ taking into account latest statistics on timber consumption made by the Institute of Forest Based Sector Economics of Johann Heinrich von Thünen-Institut, Federal Research Institute for Rural Areas, Forestry and Fisheries and the results of the actual data of NFI and Inventory study 2008. As harvesting can not be clearly allocated, all harvested timber volume is summed up under FM, while data for 1990 is not available due to circumstances related to German reunification. For this year no coherent statistics on timber production and consumption are available.

Projection data is taken from “Projection modelling of forest development and timber harvesting potential” (WEHAM), an projection model developed in relation to the second NFI cycle. Projections presented here are calculated with this model and based on latest forest inventory data from Inventory study 2008. The used scenario and underlying assumptions (rotation periods, target parameters for thinning) are taken from projections already made during NFI2. The Assumptions where derived by experts from federal and federal states forest authorities and reflect common practice in forest management.

NATURAL DISTURBANCES

The submitted data is based on the drafts and calculations made for the German inventory submission 2010 at vTI and is only covering emissions of CH_4 and N_2O. Emissions of CO_2 are included in emissions by Harvesting due to the methods used. Within the National Inventory Report 2010 the used data and steps for compiling the inventory will be explained in detail. Data on projections are not available. Appropriate data on disturbances other then forest fires is not available and as these can not be allocated geographically explicit they are completely subsumed under FM.

Forest emissions and removals data

Data in German annual GHG-inventories are based on repeated measurement of national forest inventories. These are based on national forest law carried out „as needed“ (in practice: 1987, 2002, 2012) and additional measurements (Inventory study 2008). Due to the used stock-change-method which is in line with IPCC GPG for LULUCF they deliver precise but interpolated net emissions for the periods between the cycles. In order to get a better impression on annual changes and on gains and losses for this submission methods used in German GHG-inventories (stock-change method referring to IPCC GPG for LULUCF) are combined with adapted methods for calculation of increment (gains) and losses used for harvesting calculations (see above) for calculations regarding biomass pools. As there are different datasets with different assumptions (see above) and different coverage are used, the result is illustrating the interannual trends but not usable for annual reporting under UNFCCC or KP reporting requirements because not fully compliant to relevant guidelines and not fully comparable to the annual inventory submissions with regard to emission quantities. Where data can not be allocated to AR or D, they are completely subsumed under FM.

Projections are based on WEHAM (see above) in combination with methods used in GHG inventories deriving carbon stocks from timber volume.

The submitted data on other Pools and emissions is based on the drafts and calculations made for the German inventory submission 2010 at vTI. Within the National Inventory Report 2010 the recalculations and steps for compiling the inventory will be explained in detail.

Variable	Activity	unit	Germany Historic																			Projected		
			1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Source	2015	2020	Source
General Input data																								
Forest Area	FM	1.000ha	10 815	10 811	10 806	10 801	10 796	10 791	10 786	10 781	10 776	10 771	10 766	10 762	10 757	10 752	10 747	10 742	10 737	10 732	Nat. Data	NE	NE	
	AR	1.000ha	20	40	60	80	99	119	139	159	179	199	219	239	258	278	298	318	338	358	Nat. Data	NE	NE	
	D	1.000ha	8	15	23	31	39	46	54	62	69	77	85	92	100	108	116	123	131	139	Nat. Data	NE	NE	
	Total	1.000ha	10 843	10 866	10 888	10 911	10 934	10 956	10 979	11 002	11 024	11 047	11 070	11 092	11 115	11 138	11 161	11 183	11 206	11 229	Nat. Data	NE	NE	
Harvesting	FM	1.000m^3ob	NE	45 646	49 480	51 314	53 530	54 535	54 988	57 971	58 608	58 426	74 989	58 816	60 711	65 762	73 925	82 947	87 117	96 123	Nat. Data	102 064	104 608	b)
	AR	1.000m3ob	NE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	Nat. Data	NE	NE	
	D	1.000m3ob	NE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	Nat. Data	NE	NE	
	Total	1.000m3ob	NE	45 646	49 480	51 314	53 530	54 535	54 988	57 971	58 608	58 426	74 989	58 816	60 711	65 762	73 925	82 947	87 117	96 123	Nat. Data	102 064	104 608	b)
Natural Disturbances data																								
Area Affected by Forest Fires	FM	1.000ha	1,6	0,9	4,9	1,5	1,1	0,6	1,4	0,6	0,4	0,4	0,6	0,1	0,1	1,3	0,3	0,2	0,5	0,3	Nat. Data	NE	NE	
	AR	1.000ha	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	Nat. Data	NE	NE	
	D	1.000ha	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	Nat. Data	NE	NE	
	Total	1.000ha	1,6	0,9	4,9	1,5	1,1	0,6	1,4	0,6	0,4	0,4	0,6	0,1	0,1	1,3	0,3	0,2	0,5	0,3	Nat. Data	NE	NE	
Area Affected by Storms	FM	1.000ha	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NE	NE	
	AR	1.000ha	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NE	NE	
	D	1.000ha	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NE	NE	
	Total	1.000ha	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NE	NE	
Area Affected by Other Disturbance	FM	1.000ha	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NE	NE	
	AR	1.000ha	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NE	NE	
	D	1.000ha	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NE	NE	
	Total	1.000ha	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NE	NE	
Forest emissions and removals data																								
Living Biomass Gains	FM	1.000t CO_2eq	-137 443	-137 423	-137 403	-137 384	-137 364	-137 344	-137 324	-137 304	-137 285	-137 265	-137 245	-137 225	-137 225	-123 604	-123 596	-123 588	-123 580	-123 572	Nat. Data	NE	NE	
	AR	1.000t CO2eq	-26	-139	-251	-364	-476	-589	-702	-814	-927	-1 039	-1 152	-1 264	-1 377	-1 489	-1 602	-1 714	-1 827	-1 939	Nat. Data	NE	NE	
	D	1.000t CO2eq	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	Nat. Data	NE	NE	
	Total	1.000t CO2eq	-137 469	-137 562	-137 655	-137 747	-137 840	-137 933	-138 026	-138 118	-138 211	-138 304	-138 397	-138 489	-138 602	-125 093	-125 198	-125 302	-125 407	-125 511	Nat. Data	NE	NE	
Emissions (+) from harvesting	FM	1.000t CO2eq	60 416	60 119	64 877	67 235	70 069	71 441	72 145	75 953	76 897	76 835	97 457	77 644	80 183	88 922	99 328	103 581	107 738	118 352	Nat. Data	NE	NE	
	AR	1.000t CO2eq	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Nat. Data	NE	NE	
	D	1.000t CO2eq	2 076	2 121	2 166	2 211	2 257	2 302	2 347	2 393	2 438	2 483	2 528	2 574	2 597	2 610	2 622	2 635	2 647	2 660	Nat. Data	NE	NE	
	Total	1.000t CO2eq	62 492	62 240	67 043	69 447	72 325	73 743	74 492	78 345	79 335	79 319	99 986	80 218	82 780	91 532	101 950	106 216	110 386	121 011	Nat. Data	NE	NE	
Emissions (+) from natural disturbances	FM	1.000t CO2eq	13	7	39	12	9	5	11	5	3	3	5	1	1	11	2	2	4	2	Nat. Data	NE	NE	
	AR	1.000t CO2eq	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	Nat. Data	NE	NE	
	D	1.000t CO2eq	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	Nat. Data	NE	NE	
	Total	1.000t CO2eq	13	7	39	12	9	5	11	5	3	3	5	1	1	11	2	2	4	2	Nat. Data	NE	NE	
All other net emissions (incl. other pools)	FM	1.000t CO2eq	-2 953	-2 962	-2 905	-2 954	-2 929	-2 940	-2 937	-2 937	-2 933	-2 949	-2 967	-2 967	-2 950	-2 973	-3 003	-3 017	-3 019	-3 015	Nat. Data	NE	NE	
	AR	1.000t CO2eq	-23	-47	-70	-94	-117	-140	-164	-187	-211	-234	-257	-281	-304	-328	-351	-374	-398	-421	Nat. Data	NE	NE	
	D	1.000t CO2eq	800	802	805	808	810	813	816	818	821	823	826	832	835	837	840	843	1 857	893	Nat. Data	NE	NE	
	Total	1.000t CO2eq	-2 177	-2 206	-2 170	-2 240	-2 236	-2 267	-2 286	-2 306	-2 323	-2 360	-2 398	-2 415	-2 420	-2 463	-2 514	-2 549	-1 560	-2 544	Nat. Data	NE	NE	
Net-emissions without HWP	FM	1.000t CO2eq	-79 967	-80 259	-75 392	-73 091	-70 215	-68 838	-68 106	-64 283	-63 317	-63 375	-42 750	-62 547	-59 991	-37 643	-27 269	-23 023	-18 856	-8 233	Nat. Data	183	1 613	b)
	AR	1.000t CO2eq	-50	-186	-322	-457	-593	-729	-865	-1 001	-1 137	-1 273	-1 409	-1 545	-1 681	-1 817	-1 953	-2 089	-2 225	-2 361	Nat. Data	NE	NE	
	D	1.000t CO2eq	2 875	2 923	2 971	3 019	3 067	3 115	3 163	3 211	3 259	3 307	3 355	3 406	3 432	3 447	3 462	3 478	4 504	3 553	Nat. Data	NE	NE	
	Total	1.000t CO2eq	-77 141	-77 521	-72 742	-70 529	-67 742	-66 452	-65 808	-62 074	-61 195	-61 342	-40 804	-60 686	-58 240	-36 013	-25 760	-21 634	-16 577	-7 041	Nat. Data	183	1 613	b)
Harvested wood products stock-change data																								b)
Stock-changes in HWP (SCAD)	FM	1.000t CO_2eq	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		-2822	-2 270	
	AR	1.000t CO2eq	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NE	NE	
	D	1.000t CO2eq	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NE	NE	
	Total	1.000t CO2eq	-4 443	-1 568	-1 539	-148	-3 234	-239	-2 528	-3 169	-249	-3 673	-341	-584	-426	-247	-3 722	-48	-7 698	-4 343		-2822	-2 270	
Stock-changes in HWP (PA)	FM	1.000t CO2eq	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		-8 985	-7 219	
	AR	1.000t CO2eq	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NE	NE	
	D	1.000t CO2eq	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NE	NE	
	Total	1.000t CO2eq	-616	-2 497	-2 888	-314	-6 548	-5 682	-5 580	-6 499	-5 817	-6 545	-9 552	-5 816	-8 256	-1 446	-1 417	-15 242	-16 483	-14 814		-8 985	-7 219	
Forest emissions and removals including harvested wood products data																								b)
Net-emissions with SCAD HWP	FM	1.000t CO_2eq	-79 967	-80 259	-75 392	-73 091	-70 215	-68 838	-68 106	-64 283	-63 317	-63 375	-42 750	-62 547	-59 991	-37 643	-27 269	-23 023	-18 856	-8 233	Nat. Data	183	1 613	
	AR	1.000t CO2eq	-50	-186	-322	-457	-593	-729	-865	-1 001	-1 137	-1 273	-1 409	-1 545	-1 681	-1 817	-1 953	-2 089	-2 225	-2 361	Nat. Data	NE	NE	
	D	1.000t CO2eq	2 875	2 923	2 971	3 019	3 067	3 115	3 163	3 211	3 259	3 307	3 355	3 406	3 432	3 447	3 462	3 478	4 504	3 553	Nat. Data	NE	NE	
	Total	1.000t CO2eq	-81 584	-79 089	-74 282	-70 677	-70 976	-66 691	-68 336	-65 243	-61 444	-65 014	-41 146	-61 270	-58 666	-36 260	-29 481	-21 682	-24 275	-11 384	Nat. Data	-2 639	-657	
Net-emissions with PA HWP	FM	1.000t CO2eq	-79 967	-80 259	-75 392	-73 091	-70 215	-68 838	-68 106	-64 283	-63 317	-63 375	-42 750	-62 547	-59 991	-37 643	-27 269	-23 023	-18 856	-8 233	Nat. Data	-8 985	-7 219	
	AR	1.000t CO2eq	-50	-186	-322	-457	-593	-729	-865	-1 001	-1 137	-1 273	-1 409	-1 545	-1 681	-1 817	-1 953	-2 089	-2 225	-2 361	Nat. Data	NE	NE	
	D	1.000t CO2eq	2 875	2 923	2 971	3 019	3 067	3 115	3 163	3 211	3 259	3 307	3 355	3 406	3 432	3 447	3 462	3 478	4 504	3 553	Nat. Data	NE	NE	
	Total	1.000t CO2eq	-77 757	-80 018	-75 631	-70 843	-74 290	-72 135	-71 388	-68 573	-67 012	-67 886	-50 357	-66 502	-66 497	-37 459	-27 176	-36 876	-33 059	-21 855	Nat. Data	-8 802	-5 606	

IE: included elsewhere; NE: not estimated; NO: Not occurring.

HARVESTING WOOD PRODUCTS STOCK CHANGE DATA.

The projections presented are intended to estimate potential scale of hwp accounting and illustrate potential impact when applying proposed accounting options. Therefore, two projections are presented in this paper.

Accounting	Type of projection for data 2009-2020*)	unit	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Harvested wood products																																	
Germany																																	
SCAD	A	1.000t CO2eq	-4443	-1568	-1539	-148	-3234	-239	-2528	-3169	-249	-3673	-341	-584	-426	-247	-3722	-48	-7698	-4343	-2667	-3724	-3537	-3372	-3221	-3081	-2948	-2822	-2701	-2586	-2476	-2371	-2270
SCAD	B	1.000t CO2eq	-4443	-1568	-1539	-148	-3234	-239	-2528	-3169	-249	-3673	-341	-584	-426	-247	-3722	-48	-7698	-4343	-2667	-3724	-379	-3818	-3845	-3866	-3884	-3899	-3913	-3927	-3939	-3951	-3962
PA	A	1.000t CO2eq	-616	-2497	-2888	-314	-6548	-5682	-5580	-6499	-5817	-6545	-9552	-5816	-8256	-1446	-1417	-15242	-16483	-14814	-13500	-11412	-1148	-1639	-1216	-9795	-9383	-8985	-8602	-8233	-7880	-7542	-7219
PA	B	1.000t CO2eq	-616	-2497	-2888	-314	-6548	-5682	-5580	-6499	-5817	-6545	-9552	-5816	-8256	-1446	-1417	-15242	-16483	-14814	-13500	-11412	-12493	-13237	-13797	-14256	-14655	-15016	-15350	-15665	-15963	-16246	-16517
*) for background information on calculation method and assumptions for projections, please see Working paper, Rüter (2009)																																	

Projection A assumes stable Inflow of domestically produced or domestically produced and consumed hwp to the pool until 2020. It should be used in combination with the provided projection for FM due to similar underlying assumptions. Projection B is based on the long term trend for the increase of carbon pool Inflow over the period of 1990 – 2008. In the latter case, this trend was based on the average of last 5 years of Inflow, starting from 2009.

GREECE

Data on forest fires from the Ministry of Rural Development and Food.

IRELAND

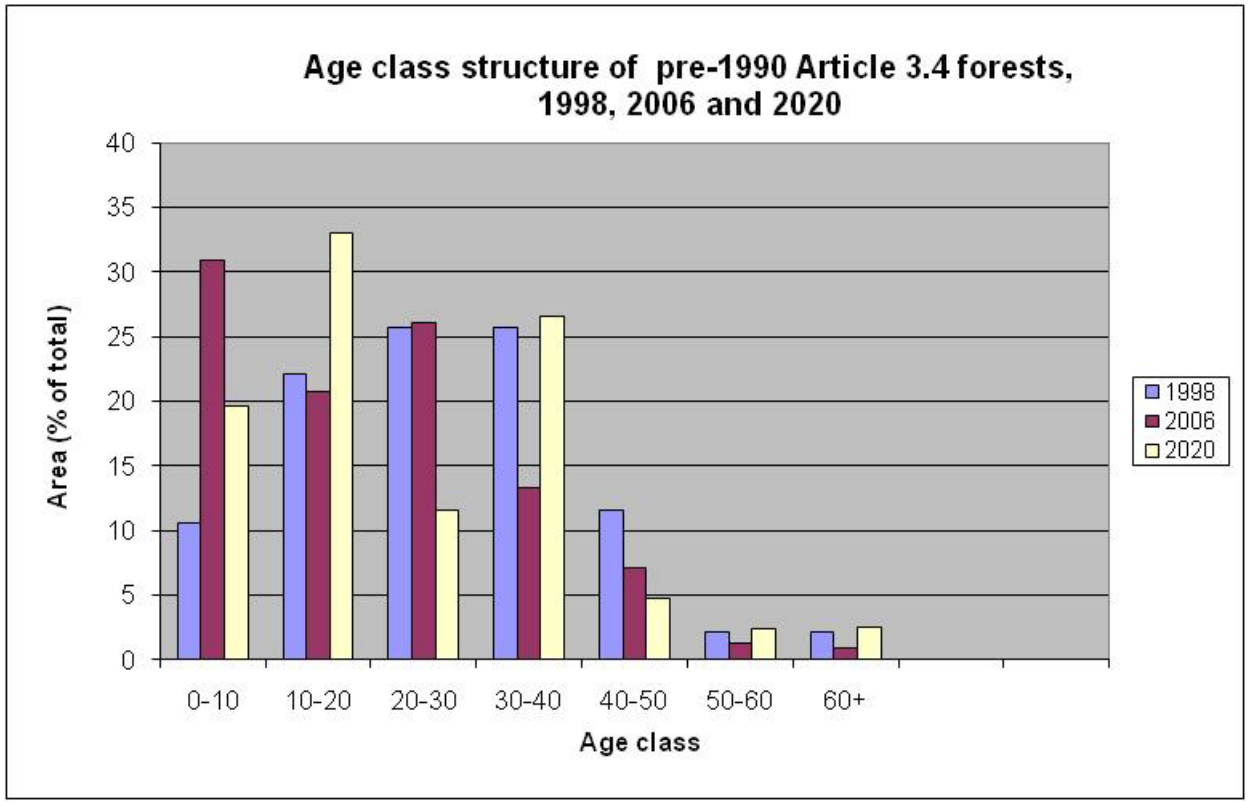
The HWP projections presented are intended to estimate potential scale of HWP accounting and illustrate potential impact when applying proposed accounting options. Therefore, two projections are presented.

Accounting	Type of projection for data 2009-2020*)	unit	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Harvested wood products																																	
Ireland																																	
SCAD	A	1.000t CO2eq	-29	-222	-29	-258	-343	-275	-344	-36	-37	-370	-56	-518	-172	-256	-332	-213	-293	-353	26	-29	-199	-19	-182	-174	-167	-160	-153	-146	-140	-134	-128
SCAD	B	1.000t CO2eq	-29	-222	-29	-258	-343	-275	-344	-36	-37	-370	-56	-518	-172	-256	-332	-213	-293	-353	26	-29	-21	-212	-214	-216	-218	-219	-221	-222	-224	-225	-227
PA	A	1.000t CO2eq	-470	-447	-556	-588	-663	-541	-635	-645	-764	-82	-966	-945	-778	-981	-88	-899	-988	-114	-388	-74	-8	-671	-643	-615	-589	-563	-539	-516	-494	-473	-452
PA	B	1.000t CO2eq	-470	-447	-556	-588	-663	-541	-635	-645	-764	-82	-966	-945	-778	-981	-88	-899	-988	-114	-388	-74	-756	-780	-82	-822	-842	-861	-878	-895	-912	-927	-942
*) for background information please see Working paper, Rüter (2009)																																	

Projection A assumes stable Inflow of domestically produced or domestically produced and consumed hwp to the pool until 2020. Projection B is based on the long term trend for the increase of carbon pool Inflow over the period of 1990 – 2008. In the latter case, this trend was based on the average of last 5 years of Inflow, starting from 2009.

Further detailed elaboration of underlying assumptions and of forest age class and management regimes are available at http://www.coford.ie/iopen24/climit-t-420_395.html.

Variable	Activity	unit	'Ireland' Historic																		Projected		
			1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Source	2015	2020	Source
General Input data																								
Forest Area	FM	1.000ha	465,84	465,81	465,78	465,75	465,70	465,66	465,61	465,56	465,50	465,44	465,38	465,30	465,22	465,14	465,04	464,93	464,82	464,69	National estimates	464,00	463,84	Coillte forecast and Black et al, in prep
	AR	1.000ha	15,82	34,96	51,66	67,66	87,12	110,83	131,81	143,25	156,17	168,84	184,54	200,00	215,05	224,15	233,89	243,99	252,02	259,20	NIR,2007	322,00	362,00	Coillte forecast and Black et al, in prep
	D	1.000ha	0,03	0,06	0,09	0,13	0,17	0,21	0,26	0,31	0,37	0,43	0,49	0,58	0,65	0,74	0,83	0,94	1,05	1,18	NIR,2007	1,70	2,03	NIR 2007 assume mean 1990 to 2007
	Total	1.000ha	481,69	500,97	517,12	534,92	552,39	575,61	596,61	608,22	621,39	634,06	649,51	664,97	681,07	689,94	700,33	711,45	719,59	727,46	NIR,2007	790,36	830,36	Coillte forecast and Black et al, in prep
Harvesting	FM	1.000m^3ob	1.779,65	1.830,25	2.149,10	1.995,65	2.210,96	2.414,93	2.508,71	2.385,81	2.480,14	2.828,34	2.925,68	2.681,36	2.894,62	2.931,21	2.797,19	2.888,59	2.912,42	2.952,08	EUROSTAT_FAO	2.848,10	3.631,88	Coillte forecast and Black et al, in prep
	AR	1.000m3ob																			Not occurring (NO)	1.425,00	2.103,00	CARBWARE model (Black 2007, 2008) density 0.4
	D	1.000m3ob	7,35	6,75	6,90	7,35	9,04	9,07	11,29	12,19	12,86	13,66	14,32	18,64	16,38	19,79	20,81	24,41	25,58	28,92	rea (45tC ha-1 and density of 0.4), NIR,2007	14,74	14,74	NIR 2007 assume mean 1990 to 2007
	Total	1.000m3ob	1.787,00	1.837,00	2.156,00	2.003,00	2.220,00	2.424,00	2.520,00	2.398,00	2.493,00	2.842,00	2.940,00	2.700,00	2.911,00	2.951,00	2.818,00	2.913,00	2.938,00	2.981,00	sum	4.287,84	5.749,62	sum
Natural Disturbances data																								
Area Affected by Forest Fires	FM	1.000ha	0,39	0,25	0,16	0,32	0,37	0,51	0,57	0,31	0,16	0,13	0,33	0,67	0,15	0,94	0,55	0,20	0,20	0,22	FRA, 2010	0,20	0,20	Estimated
	AR	1.000ha																						
	D	1.000ha																						
	Total	1.000ha	0,39	0,25	0,16	0,32	0,37	0,51	0,57	0,31	0,16	0,13	0,33	0,67	0,15	0,94	0,55	0,20	0,20	0,22	Forest service	0,20	0,20	
Area Affected by Storms	FM	1.000ha	0,56	0,27	0,42	0,31	0,52	0,14	0,32	0,21	1,30	3,01	3,03	1,33	0,78	0,38	0,21	0,25	0,25	0,25	Forest service	0,25	0,25	Estimated
	AR	1.000ha																						
	D	1.000ha																						
	Total	1.000ha	0,56	0,27	0,42	0,31	0,52	0,14	0,32	0,21	1,30	3,01	3,03	1,33	0,78	0,38	0,21	0,25	0,25	0,25	Forest service	0,25	0,25	
Area Affected by Other Disturbance	FM	1.000ha																			Not estimated (NE)			NE
	AR	1.000ha																						
	D	1.000ha																						
	Total	1.000ha																			NE			NE
Forest emissions and removals data																								
Living Biomass Gains	FM	1.000t CO_2eq	-1.695	-1.848	-1.922	-1.786	-1.779	-1.823	-1.822	-1.663	-1.811	-2.072	-1.883	-1.616	-1.852	-2.257	-1.845	-1.925	-2.018	-2.291	Black et al, in prep	-1.230	-403	Coillte forecast and Black et al, in prep
	AR	1.000t CO2eq	-6	-20	-45	-74	-110	-155	-212	-276	-347	-428	-525	-639	-773	-925	-1.092	-1.277	-1.479	-1.695	Black et al,2008,2007	-3.512	-4.480	CARBWARE model (Black 2007, 2008)
	D	1.000t CO2eq																			included elsewhere (IE) in FM (IE, FM)			IE, FM
	Total	1.000t CO2eq	-1.701	-1.869	-1.966	-1.860	-1.889	-1.979	-2.034	-1.939	-2.158	-2.500	-2.408	-2.255	-2.625	-3.181	-2.937	-3.201	-3.496	-3.986	sum	-4.742	-4.883	sum
Emissions (+) from harvesting	FM	1.000t CO2eq	632	649	762	708	785	857	891	848	881	1.005	1.040	955	1.029	1.044	996	1.030	1.039	1.054	Black et al, in prep	841	1.114	Coillte forecast, Black et al, in prep
	AR	1.000t CO2eq																				485	717	CARBWARE model (Black 2007, 2008)
	D	1.000t CO2eq	5	5	5	5	7	7	8	9	9	10	11	14	12	15	15	18	19	21	based on area (45tC ha-1)	11	11	based on area (45tC ha-1)
	Total	1.000t CO2eq	637	654	767	714	791	864	899	857	891	1.015	1.050	968	1.041	1.058	1.012	1.048	1.057	1.075	sum	1.336	1.841	sum
Emissions (+) from natural disturbances	FM	1.000t CO2eq	19	12	8	16	19	25	28	15	8	7	17	33	8	47	27	10	10	11	CARBWARE method, NIR 2007	20	20	mean NIR values
	AR	1.000t CO2eq																						
	D	1.000t CO2eq																						
	Total	1.000t CO2eq	19	12	8	16	19	25	28	15	8	7	17	33	8	47	27	10	10	11		20	20	
All other net emissions (incl. other pools)	FM	1.000t CO2eq	-207	-192	-84	-140	-69	-3	24	-26	-2	110	132	36	94	91	25	37	23	2	er, dead wood and soils, Black et al in prep	-403	6	litter, dead wood and soils, Black et al in prep
	AR	1.000t CO2eq	15	27	34	40	46	54	59	53	-3	-11	-37	-122	-180	-228	-284	-341	-24	61	litter, dead wood and soils, Black et al 2007	-794	-1.025	litter, dead wood and soils, Black et al 2007
	D	1.000t CO2eq																			NO			
	Total	1.000t CO2eq	-192	-164	-49	-100	-23	51	82	27	-4	99	95	-86	-86	-137	-258	-304	-1	63	sum	-1.197	-1.019	
Net-emissions without HWP	FM	1.000t CO2eq	-1.251	-1.378	-1.235	-1.202	-1.045	-944	-880	-825	-924	-950	-695	-592	-721	-1.076	-795	-848	-946	-1.224		-773	737	
	AR	1.000t CO2eq	10	7	-10	-35	-64	-101	-153	-223	-349	-439	-561	-761	-953	-1.152	-1.376	-1.618	-1.503	-1.634		-3.821	-4.788	
	D	1.000t CO2eq	5	5	5	5	7	7	8	9	9	10	11	14	12	15	15	18	19	21		11	11	
	Total	1.000t CO2eq	-1.235	-1.367	-1.241	-1.231	-1.102	-1.039	-1.025	-1.040	-1.263	-1.379	-1.245	-1.339	-1.662	-2.213	-2.156	-2.447	-2.430	-2.837		-4.583	-4.040	
Harvested wood products stock-change data																								
Stock-changes in HWP (SCAD)	FM	1.000t CO_2eq	-29	-222	-29	-258	-343	-275	-344	-36	-37	-370	-56	-518	-172	-256	-332	-213	-293	-353	rueter	-160	-128	
	AR	1.000t CO2eq																			NO			
	D	1.000t CO2eq																						
	Total	1.000t CO2eq	-178	-124	-127	-219	-276	-290	-351	-341	-388	-463	-540	-609	-258	-327	-401	-281	-350					
Stock-changes in HWP (PA)	FM	1.000t CO2eq	-470	-447	-556	-588	-663	-541	-635	-645	-764	-82	-966	-945	-778	-981	-88	-899	-988	-114	rueter	-563	-452	Black et al, in prep, Coillte forecast
	AR	1.000t CO2eq																			NO			NE
	D	1.000t CO2eq																						NE
	Total	1.000t CO2eq	-386	-574	-786	-745	-737	-798	-1.016	-969	-1.006	-1.096	-1.110	-1.109	-958	-1.344	-1.171	-1.220	-1.419	NE				Black et al, in prep, Coillte forecast
Forest emissions and removals including harvested wood products data																								
Net-emissions with SCAD HWP	FM	1.000t CO_2eq	-1.279	-1.600	-1.265	-1.460	-1.387	-1.219	-1.223	-861	-961	-1.320	-751	-1.110	-894	-1.331	-1.128	-1.060	-1.238	NE				NE
	AR	1.000t CO2eq	10	7	-10	-35	-64	-101	-153	-223	-349	-439	-561	-761	-953	-1.152	-1.376	-1.618	-1.503	-1.634				NE
	D	1.000t CO2eq	5	5	5	5	7	7	8	9	9	10	11	14	12	15	15	18	19	21				NE
	Total	1.000t CO2eq	-1.265	-1.588	-1.270	-1.489	-1.444	-1.314	-1.368	-1.075	-1.301	-1.749	-1.301	-1.857	-1.835	-2.469	-2.488	-2.660	-2.722					
Net-emissions with PA HWP	FM	1.000t CO2eq	-1.720	-1.826	-1.792	-1.789	-1.708	-1.486	-1.515	-1.470	-1.687	-1.033	-1.661	-1.537	-1.500	-2.057	-883	-1.746	-1.933	NE				
	AR	1.000t CO2eq	10	7	-10	-35	-64	-101	-153	-223	-349	-439	-561	-761	-953	-1.152	-1.376	-1.618	-1.503	-1.634				
	D	1.000t CO2eq	5	5	5	5	7	7	8	9	9	10	11	14	12	15	15	18	19	21	NE			
	Total	1.000t CO2eq	-1.705	-1.814	-1.797	-1.819	-1.765	-1.580	-1.660	-1.684	-2.027	-1.461	-2.211	-2.284	-2.440	-3.195	-2.243	-3.346	-3.417					



ITALY

SOURCE FOR FOREST FIRE DATA

Italian National Forest Service – Corpo Forestale dello Stato. (available on the Italian National Forest Service web site:

http://www3.corpoforestale.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/340)

LATVIA

Latvia's data source is National Inventory Report submission 2009. All data provided is consistent with submission 2009.

Preparing GHG inventory in LULUCF sector for year 2007 (submission in 2009) the forest data source has been changed (new NFI data is used) and all historical data are recalculated.

Please, see National Inventory Report of Latvia on the web page:

http://cdr.eionet.europa.eu/lv/un/colqlvn8g/envsews7a/CRF_XML_UNFCCC_150409.zip/manage_document

PORTUGAL

Forest data – Article 3.3 activities (Afforestation, Reforestation, Deforestation) and Article 3.4 Forest management

Variable	Activity	unit	PORTUGAL																		Projected NR or NE		
			1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2015	2020	Source
General Input data																							
Forest Area	FM	1.000ha	3.352	3.341	3.336	3.331	3.325	3.320	3.308	3.296	3.284	3.272	3.259	3.247	3.235	3.223	3.211	3.199	3.187	3.175	3.135	3.110	
	AR	1.000ha	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	350	400	
	D	1.000ha	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
	Total	1.000ha	3.367	3.371	3.381	3.391	3.400	3.410	3.413	3.416	3.419	3.422	3.424	3.427	3.430	3.433	3.436	3.439	3.442	3.445	3.485	3.510	
Harvesting	FM	1.000m^3ob	14.423	13.851	13.172	13.086	12.604	12.044	11.580	11.593	11.052	11.580	11.197	11.524	11.222	12.358	13.873	13.664	13.773	13.785	11.547	11.511	
	AR	1.000m^3ob	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	D	1.000m^3ob	266	266	266	266	266	266	260	260	260	260	260	260	260	247	247	247	245	245	233	233	
	Total	1.000m^3ob	14.689	14.116	13.438	13.352	12.870	12.310	11.840	11.854	11.312	11.840	11.457	11.784	11.483	12.606	14.120	13.912	14.018	14.031	11.780	11.744	
Natural Disturbances data																							
Area Affected by Forest Fires	FM	1.000ha	79	124	39	23	13	85	29	11	55	30	65	43	61	268	52	198	34	9	51	49	
	AR	1.000ha	0	1	1	0	0	2	1	0	2	1	4	2	4	18	4	15	3	1	6	6	
	D	1.000ha	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	
	Total	1.000ha	80	126	40	24	14	88	31	12	57	31	69	46	65	286	56	214	36	10	56	55	
Area Affected by Storms	FM	1.000ha	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	
	AR	1.000ha	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	
	D	1.000ha	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	
	Total	1.000ha	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	
Area Affected by Other Disturbances	FM	1.000ha	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	
	AR	1.000ha	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	
	D	1.000ha	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	
	Total	1.000ha	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	
Forest emissions and removals data																							
Living Biomass Gains (-)	FM	1.000t CO_2eq	-18.911	-19.052	-19.122	-19.192	-19.262	-19.332	-19.333	-19.334	-19.335	-19.337	-19.338	-19.339	-19.340	-18.374	-18.375	-18.376	-18.376	-18.376	-17.237	-17.099	
	AR	1.000t CO_2eq	-95	-189	-284	-378	-473	-568	-665	-763	-861	-959	-1.056	-1.154	-1.252	-1.282	-1.375	-1.468	-1.561	-1.654	-2.038	-2.330	
	D	1.000t CO_2eq																					
	Total	1.000t CO_2eq	-19.006	-19.241	-19.406	-19.570	-19.735	-19.900	-19.999	-20.097	-20.196	-20.295	-20.394	-20.493	-20.592	-19.656	-19.750	-19.844	-19.937	-20.030	-19.275	-19.429	
Emissions (+) from harvesting	FM	1.000t CO_2eq	18.450	17.802	16.954	16.844	16.229	15.491	14.915	14.931	14.257	14.953	14.492	14.924	14.599	16.061	17.986	17.788	17.908	17.923	15.033	15.012	
	AR	1.000t CO_2eq	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	
	D	1.000t CO_2eq	396	396	396	396	396	396	390	390	390	390	390	390	390	371	371	371	364	364	346	346	
	Total	1.000t CO_2eq	18.846	18.198	17.349	17.240	16.625	15.886	15.305	15.321	14.647	15.343	14.882	15.314	14.989	16.432	18.357	18.159	18.273	18.288	15.380	15.358	
Emissions (+) from disturbances	FM	1.000t CO_2eq	3.812	5.266	1.631	1.117	531	3.939	1.452	532	2.632	1.300	3.132	1.812	2.674	10.385	1.755	7.749	1.188	337	1.922	1.819	
	AR	1.000t CO_2eq	17	48	22	21	13	115	50	21	117	64	172	107	173	722	128	623	100	31	225	243	
	D	1.000t CO_2eq																					
	Total	1.000t CO_2eq	3.829	5.314	1.653	1.138	544	4.054	1.502	553	2.749	1.364	3.305	1.920	2.847	11.106	1.883	8.372	1.288	368	2.147	2.063	
All other net-emissions (+/-) from other pools	FM	1.000t CO_2eq																					
	AR	1.000t CO_2eq																					
	D	1.000t CO_2eq	125	125	125	125	125	125	123	123	123	123	123	123	123	123	123	123	123	123	123	123	
	Total	1.000t CO_2eq	125	125	125	125	125	125	123	123	123	123	123	123	123	123	123	123	123	123	123	123	
Net-emissions without HWP	FM	1.000t CO_2eq	3.351	4.016	-537	-1.230	-2.501	98	-2.967	-3.871	-2.446	-3.084	-1.714	-2.603	-2.067	8.072	1.366	7.161	720	-116	-281	-268	
	AR	1.000t CO_2eq	-78	-141	-261	-357	-460	-453	-615	-742	-744	-895	-884	-1.046	-1.079	-560	-1.246	-844	-1.460	-1.623	-1.813	-2.086	
	D	1.000t CO_2eq	521	521	521	521	521	521	513	513	513	513	513	513	513	494	494	494	487	487	469	469	
	Total	1.000t CO_2eq	3.794	4.396	-278	-1.067	-2.441	166	-3.068	-4.100	-2.677	-3.465	-2.084	-3.136	-2.633	8.005	613	6.810	-253	-1.251	-1.625	-1.885	

GENERAL INPUT DATA - FOREST AREA, HARVESTING AND AREA AFFECTED BY NATURAL DISTURBANCES.

FOREST AREA

Land reported under forest land remaining forest land in the UNFCCC is reflecting total forest area, i.e, including net-changes of AR and D. Forest data was updated to include separate estimates of AR and D. Total AR and D areas were revised, while full consistency with reported total forest areas as estimated in National Forest Inventories was persued. The area estimate of the National Forest Inventory of 2005 had not been previously included and has been introduced in estimates that were now presented.

HARVESTING

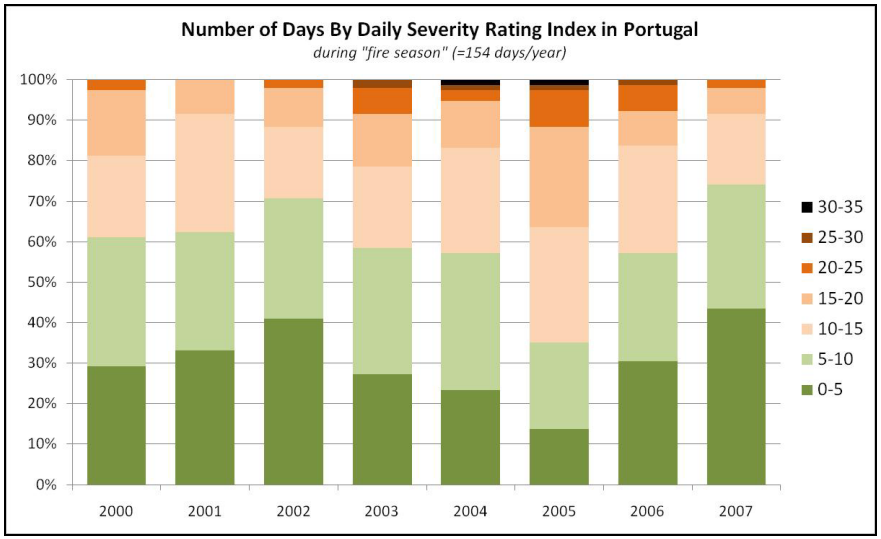
FAO roundwood production for Portugal separates only harvesting volumes of softwood and hardwood, and NIR assumed that all softwood was maritime Pine and all hardwood was Eucalyptus, the main species with industrial use. New estimates include wood from other species.

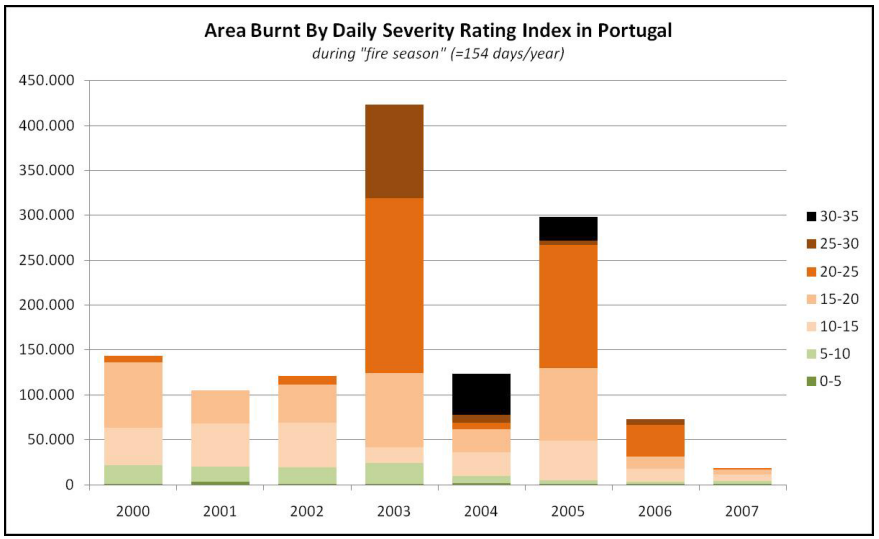
NATURAL DISTURBANCES

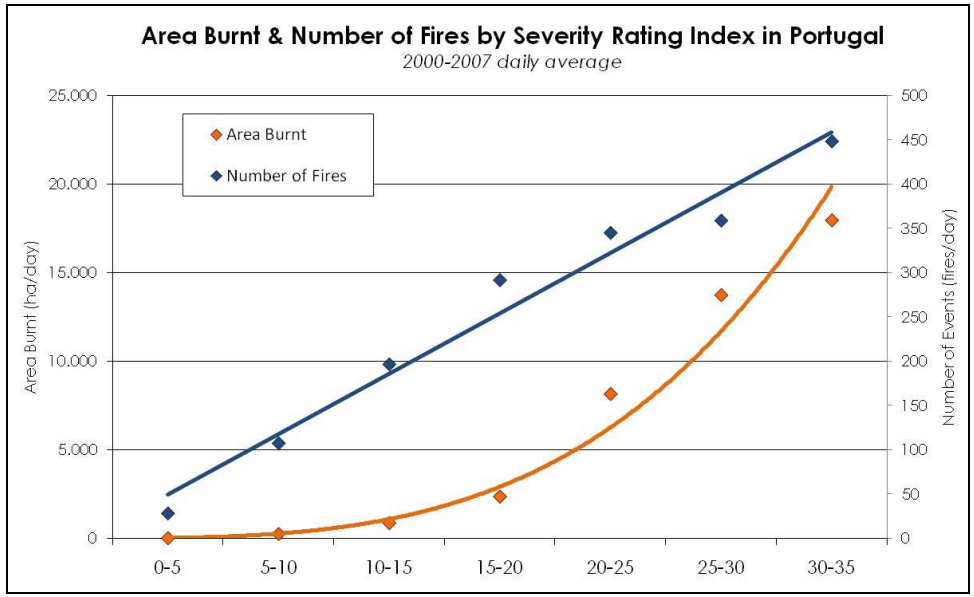
Only forest fires were considered. A differentiation by main tree species was introduced to better reflect the fire impacts on different forest systems.

Data on fires and forest fires is derived from annual fire reports (in Portuguese only) available at http://www.afn.min-agricultura.pt/portal/dudf/informacoes/relatorios. Other indicators on fire size, number, fire risk, etc. are also available in those reports. The 2003 annual report contains an extensive analysis of the impact of that summer's heat wave on forest fires.

The relation between the daily severity index (an index calculated daily that reflects a combination of weather forecasts indicators and conditions in the forest fuels for fire propagation) and fire area and number are illustrated below.


Number of Days By Daily Severity Rating Index in Portugal
during "fire season" (=154 days/year)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2000
2001
2002
2003
2004
2005
2006
2007
30-35
25-30
20-25
15-20
10-15
5-10
0-5


Area Burnt By Daily Severity Rating Index in Portugal
during "fire season" (=154 days/year)
450.000
400.000
350.000
300.000
250.000
200.000
150.000
100.000
50.000
0
2000
2001
2002
2003
2004
2005
2006
2007
30-35
25-30
20-25
15-20
10-15
5-10
0-5



Forest emissions and removals data

Removals were re-estimated assuming the new area estimates, while using the average growth rates formally utilized.

Emissions from harvesting were revised to reflect new estimates of harvest volumes. They include salvaged wood, industrial wood and wood for energy and have been estimated to reflect the total tree carbon (i.e. including branches, roots, etc.) according to the instant oxidation principle.

Emissions from forest fires were revised to reflect burnt area by main tree species and a more detailed assessment of biomass loss in forest fires. Reported emissions include total direct N2O and CH4 emissions and CO2 emissions from non-salvaged wood. Emissions from salvaged wood are included under harvest emissions. Previous emissions estimates included only non-CO2 gases, except for 2003, where also CO2 emissions were partially included.

Deforestation emissions were revised to include the oxidation of all tree biomass and also emissions from shrubs and litter, which had previously not been considered. Average standing volumes were updated to reflect the NFI of 2005 (previously volumes from the 1995 NFI were used).

SPAIN:

Forest data – Article 3.3 activities (Afforestation, Reforestation, Deforestation) and Article 3.4 Forest management

GENERAL INPUT DATA - FOREST AREA, HARVESTING AND AREA AFFECTED BY NATURAL DISTURBANCES.

FOREST AREA

Forest area is the same considered in Bangkok submission, but has been disaggregated between FM, A/R and D. Projections for FM have been estimated from EFISCEN model. Currently work is being done in order to improve these projections.

EXPLANATION FROM DIFFERENCE BETWEEN DATA IN THIS SUBMISSION AND UNFCCC INVENTORY DATA FOR FOREST AREA:

National definition for forest (F) for UNFCCC and KP are different. In Spanish National Inventory submission to UNFCCC, F definition considered a threshold of FCC >10%.

In its Initial Report, Spain submitted to UNFCCC its definition for Forest under the Kyoto Protocol. In this definition, Forests are those areas with FCC>20%.

For this reason, the area of forest land remaining forest land reported in the data update for data submission is different from data contained in National Inventory. These are the data that will be used for the calculations of emissions and removals of FL remaining FL under the KP, that will be presented next year as part of the supplementary information under the KP in the Annual National Inventory.

Calculations of historical net-removals have been made using implied emission factors from common reporting format table's from submission 1990-2007. It must be pointed out that emission of N_2O and CH_4 from wild forest fires have been discounted from these net removals.

AGE CLASS STRUCTURE

Spain is working on age class structure data compilation.

HARVESTING

Harvesting data is taken from FAO statistics.

NATURAL DISTURBANCES

Based on National Data about Forest Fires. Source “Forest Fires in Spain 2007” Ministry of Environment for Rural and Marine Affairs. It is expected that the area affected by forest fires, taking into account specific characteristics from Mediterranean conditions and climate change impacts expected in this area, would increase.

FOREST EMISSIONS AND REMOVALS DATA

Forest emissions and removals data are based on reviewed forest area according to Spanish definition of forest under the Kyoto Protocol. Projections for emissions and removals from FM have been estimated from EFISCEN model. Currently work is being done in order to modify these projections to adjust them to Spanish Forest definition under the Kyoto Protocol.

HARVESTING WOOD PRODUCTS STOCK CHANGE DATA.

Data presented in this submission are the same as presented in Bangkok (Source: Pingoud).

Variable	Activity	unit	SPAIN Historic																			Projected		
			1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Source	2015	2020	Source
General Input data																								
Forest Area	FM	1.000ha	12545	12545	12545	12545	12545	12545	12545	12545	12545	12545	12545	12545	12545	12545	12545	12545	12545	12545	Nat data	-	-	-
	AR	1.000ha					57	136	233	322	406	460	522	560	581	605	625	646	668	685	Nat data	-	-	-
	D	1.000ha	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-
	Total	1.000ha	12545	12545	12545	12545	12602	12682	12778	12867	12951	13005	13067	13105	13126	13150	13171	13191	13213	13230	Nat data	-	-	-
Harvesting	FM	1.000m^3ob	15590	15188	13924	13767	15305	16075	15631	15631	14874	14810	14321	15131	15839	16105	16290	15531	15716	14528	FAO	-	-	-
	AR	1.000m3ob	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	-	-	-	-
	D	1.000m3ob	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	-	-	-	-
	Total	1.000m3ob	15590	15188	13924	13767	15305	16075	15631	15631	14874	14810	14321	15131	15839	16105	16290	15531	15716	14528	FAO	-	-	-
Natural Disturbances data																								
Area Affected by Forest Fires	FM	1.000ha	73,2	116,9	40,4	33,4	250,4	42,1	10,3	21,3	42,7	23,9	45,9	19,2	25,2	53,7	51,7	69,4	71,1	29,4	Nat data	-	-	-
	AR	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	D	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	1.000ha	73,2	116,9	40,4	33,4	250,4	42,1	10,3	21,3	42,7	23,9	45,9	19,2	25,2	53,7	51,7	69,4	71,1	29,4	Nat data	-	-	-
Area Affected by Storms	FM	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	AR	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	D	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Affected by Other Disturbances	FM	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	AR	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	D	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	1.000ha	421,0										406,0	-	-	-	-	-	-	-	UNECE	-	-	-
Forest emissions and removals data																								
Living Biomass Gains	FM	1.000t CO_2eq	-19922	-19922	-19922	-19922	-19922	-19922	-19922	-19922	-19922	-19922	-19922	-19922	-19922	-19922	-19922	-19922	-19922	-19922	Nat data	-	-	-
	AR	1.000t CO2eq	0	0	0	0	-461	-1109	-2000	-2822	-3664	-4185	-4896	-5358	-5565	-5798	-5964	-6116	-6343	-6465	Nat data	-	-	-
	D	1.000t CO2eq	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-
	Total	1.000t CO2eq	-19922	-19922	-19922	-19922	-20382	-21031	-21921	-22743	-23585	-24107	-24817	-25279	-25486	-25719	-25885	-26037	-26265	-26387	Nat data	-	-	-
Emissions (+) from harvesting	FM	1.000t CO2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	AR	1.000t CO2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	D	1.000t CO2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	1.000t CO2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Emissions (+) from natural disturbances	FM	1.000t CO2eq	75	107	40	34	229	63	18	55	54	34	69	28	45	62	50	103	223	15	Forest Fire Area (Min.Env.)	-	-	-
	AR	1.000t CO2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	D	1.000t CO2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	1.000t CO2eq	75	107	40	34	229	63	18	55	54	34	69	28	45	62	50	103	223	15	Forest Fire Area (Min.Env.)	-	-	-
All other net emissions (incl. other pools)	FM	1.000t CO2eq	1791	2561	952	815	5504	1507	440	1318	1285	808	1667	681	1074	1481	1191	2475	5354	363	Forest Fire Area (Min.Env.)	-	-	-
	AR	1.000t CO2eq																			-	-	-	-
	D	1.000t CO2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	1.000t CO2eq	1791	2561	952	815	5504	1507	440	1318	1285	808	1667	681	1074	1481	1191	2475	5354	363	Forest Fire Area (Min.Env.)	-	-	-
Net-emissions	FM	1.000t CO2eq	-18056	-17254	-18930	-19073	-14188	-18352	-19463	-18549	-18583	-19080	-18185	-19212	-18803	-18379	-18681	-17344	-14345	-19543		-14961	-15558	JRC
	AR	1.000t CO2eq	-	-	-	-	-461	-1109	-2000	-2822	-3664	-4185	-4896	-5358	-5565	-5798	-5964	-6116	-6343	-6465	-	-	-	-
	D	1.000t CO2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	1.000t CO2eq	-18056	-17254	-18930	-19073	-14649	-19461	-21463	-21371	-22247	-23265	-23081	-24570	-24368	-24177	-24645	-23459	-20688	-26009		-	-	-

SWEDEN

Forest data

The data provided for Sweden in this submission comes from different sources. Some of the figures represent data already submitted under the UNFCCC whereas others, mainly data on ARD and all of the projections are preliminary results originating from an ongoing government commission.

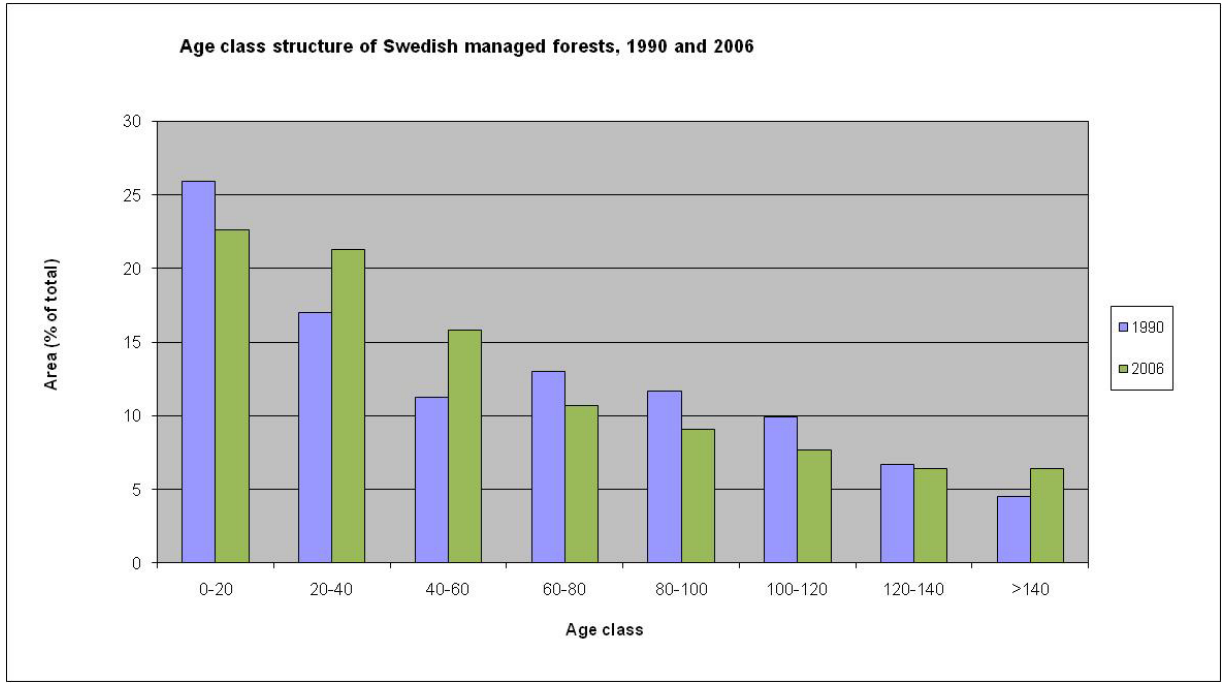
General Input data - Forest Area, harvesting and area affected by natural disturbances.

Forest area

The submitted data are to a large extent estimated for this data submission. Total forest area for 1990 is based on the total area for Forest land reported under category 5A (UNFCCC, Subm 2009). The area for AR and D represents estimates prepared for Submission 2010 (UNFCCC/KP). The area for FM for year X is estimated by subtracting the annual deforested area in year X from the FM area in year X-1. Total forest area is the sum of FM and AR. Both AR and D areas are accumulated from 1990 according to the requirements under KP. The area estimates for AR and D for 2005-2007 are preliminary.

Age class structure

Data represents official forest data according to the Swedish NFI (www-nfi.slu.se/Resultat/Alder.htm).



HARVESTING

Total harvest represents gross fellings, which is the amount of wood annually supplied to the forest industry and the energy sector in Sweden and other countries. Annual data on gross fellings is compiled by the Swedish forest agency[7]. This data has also been used to describe roundwood production for Sweden in this submission. The harvest for D was approximated assuming a harvest rate of 100 m^3sk/ha (which corresponds to the average harvest on deforested land) used together with the estimated area for D. The harvest for FM is the total harvest minus harvest for D.

NATURAL DISTURBANCES

Estimates for area affected by natural disturbances are only given for forest fires. In 2005 and 2007, two storms caused large damages on the forest in southern Sweden. No area estimate is given in the table, but estimates by the Swedish forest agency indicate that well over 100 000 ha were damaged by the two storms. In the storm in 2005, approximately 75 million m³ were wind thrown or damaged which corresponds to nearly an entire year's cutting for the whole of Sweden and represents ca 2.5 % of the total standing stock. About 12 million m³ was estimated to be damaged in the storm that swept southern Sweden in January 2007.

[7] www.svo.se/minskog/Templates/EPFileListing.asp?id=16712

Estimates for emissions due to natural disturbances include forest fire data according to the UNFCCC-reporting for Forest land. For the years 2005-2007 the assumed loss of wood according to the large storms in 2005 and 2007 has been added. The estimate of the total loss (3 M ton CO_2) only includes volumes that were not taken care of. The wood is assumed to decompose over a period of ten years starting from 2005. Methods to estimate net effects due to storms need to be further developed. For example most of the damaged wood was taken care of and dramatically increased the annual harvested level for these years as compared to other years. Some of this was balanced out by reduced harvesting levels following years. However, the net effect over several years was an increased harvest and thus increased emissions due to natural disturbances. These emissions are not explicitly included in this submission.

The Swedish system for reporting to UNFCCC, using a five-year inventory cycle and interpolation, includes but also levels out the effect of storms of this magnitude.

FOREST EMISSIONS AND REMOVALS DATA

Sweden reports carbon stock changes in living biomass using the stock change method based on the estimated standing stock on permanent NFI sample plots (NIR 2009)[8]. Therefore separate estimates of gains and losses have not been reported to the UNFCCC. In order to add information on gains and losses we have made a number of approximations to provide these figures: (i) The data reported in the rows for gains and losses in the table is based on the measured gross increment[9], (ii) the total harvest figures is calculated subtracting the gross increment from the total net removals in Living biomass, (iii) the harvest on D areas was approximated using an average gross felling on these areas of 100 m^3sk, (iv) conversion to carbon dioxide emitted or sequestered was made assuming an average wood density of 300 kg/m^3 and a carbon content of 50%. Therefore, results for gains and losses in the data sheet should be used with caution.

A brief description on the assumptions behind the estimates of AR and D areas as well as the estimates of the litter and soil carbon pool changes can be found in the EU LULUCF Bangkok submission[10]. In that submission Sweden also reflects over the uncertainties associated with the LULUCF-sector and HWP.

PROJECTIONS

The projections for net removals are analyzed using the HUGIN modelling tool, which simulates the future development of the forests on the basis of assumptions on how they are managed and harvested over a hundred-year period. Present forest management practices are assumed, including environmental measures in forestry and environmental policy aimed at preserving biological diversity. Detailed assumptions are the same as in the reference scenario for the long term forest state calculations made by the Swedish forest agency in 2008 (SKA-VB 08)[11] adding a gradually increased use of forest residues. The calculations encompass living trees on forest soil. Productive land in national parks, nature reserves and habitat protection areas is included in the results. The estimates are assumed to represent Forest management (KP).

[8] National inventory report 2009, Sweden: http://www.naturvardsverket.se/upload/05_klimat_i_forandring/statistik/2008/NIR_submission_2009.pdf

[9] http://www-nfi.slu.se/Resultat/Tillvaxt.htm

[10] http://unfccc.int/files/meetings/ad_hoc_working_groups/kp/application/pdf/eu_submission_lulucf_annex_i_data_needs.pdf

[11] http://www.skogsstyrelsen.se/episerver4/templates/SFileListing.aspx?id=41399, (SKA-VB 08 Resultat - Referens.xls in Swedish)

Annual felling is set at the level of what is regarded as sustainable i.e. the highest possible without decreasing the standing stock on production forests also taken into account nature conservation measures in production forests.

The projection for soil carbon is based on the mean value between 1993 and 2005 and calculations of the future effect on the soil of an increased use of forest residues, using the Q-model[12]. Other emissions, such as biomass burning, are based on the mean values for 2003-2007.

Projections for AR and D are mainly based on trends for the period 1990-2007 assuming a constant annual afforestation/reforestation and deforestation rate and the characteristics of the emission factors used. The estimate for living biomass for AR has been modelled using age class distributed gross increment. The estimate for net removals from FM has been corrected for the emissions from annual deforestation since forest area in the HUGIN-system are assumed to be constant and do not include land use conversions.

HWP estimates are based on the harvest levels in the reference scenario assuming the same trade of wood products as for the period 2003-2007. PA and SCAD estimates use IPCC default half lives (30:2).

Historical net emissions as well as projections are affected by gradually changes in the age class distribution. Intensified forest management practices on a majority of the forestland in combination with additional areas being protected for nature conservation, gradually results in a higher share of younger forests, with the exception of very old forests in protected areas that also will increase (+140 years).

[12] Agren,G.I., Hyvonen,R., Nilsson,T., 2007. Are Swedish forest soils sinks or sources for CO2 - model analyses based on forest inventory data. Biogeochemistry 82, 217-227.

Variable	Activity	unit	Sweden																			Projected NR or NE		
			1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Source	2015	2020	Source
General Input data																								
Forest Area	FM	1.000ha	28 179	28 170	28 153	28 137	28 124	28 108	28 099	28 090	28 077	28 067	28 051	28 037	28 026	28 020	28 007	27 992	27 977	27 962	UNFCCC/nat.data	27 858	27 793	nat.data
	AR	1.000ha	22	30	41	52	58	68	76	84	99	113	123	137	155	165	193	206	218	264	UNFCCC/nat.data	330	390	nat.data
	D	1.000ha	14	22	39	55	68	84	93	102	115	125	141	155	166	172	185	200	215	230	UNFCCC/nat.data	330	390	nat.data
	Total	1.000ha	28 201	28 201	28 194	28 189	28 182	28 176	28 175	28 175	28 176	28 180	28 174	28 174	28 181	28 185	28 200	28 198	28 195	28 226	UNFCCC/nat.data	28 188	28 183	nat.data
Harvesting	FM	1.000m^3ob	64 647	63 180	64 262	65 407	67 723	76 363	69 086	73 168	73 672	70 970	76 378	76 649	80 899	82 390	85 707	120 500	78 500	95 500	nat.data	92 822	92 757	nat.data
	AR	1.000m3ob	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	D	1.000m3ob	1 353	820	1 738	1 593	1 277	1 637	914	832	1 328	1 030	1 622	1 351	1 101	610	1 293	1 500	1 500	1 500	nat.data	1 278	1 278	nat.data
	Total	1.000m3ob	66 000	64 000	66 000	67 000	69 000	78 000	70 000	74 000	75 000	72 000	78 000	78 000	82 000	83 000	87 000	122 000	80 000	97 000	nat.data	94 100	94 035	nat.data
Natural Disturbances data																								
Area Affected by Forest Fires	FM	1.000ha	1,7	1,4	1,4	1,5	1,4	1,4	1,7	6,6	0,8	3,6	2,6	3,4	5,1	5,4	5,3	4,4	8,8	2,4	UNFCCC	4,2	4,2	nat.data
	AR	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	D	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	Total	1.000ha	1,7	1,4	1,4	1,5	1,4	1,4	1,7	6,6	0,8	3,6	2,6	3,4	5,1	5,4	5,3	4,4	8,8	2,4	UNFCCC	4,2	4,2	nat.data
Area Affected by Storms	FM	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	AR	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	D	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	Total	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
Area Affected by Other Disturbances	FM	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	AR	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	D	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	Total	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
Forest emissions and removals data																								
Living Biomass Gains	FM	1.000t CO_2eq	-111 100	-110 000	-110 000	-110 000	-110 000	-108 900	-108 900	-111 100	-111 100	-112 200	-114 400	-116 600	-122 100	-125 400	-123 200	-133 100	-132 000	-132 000	nat.data	-135 628	-134 345	nat.data
	AR	1.000t CO2eq	-15	-15	-40	-35	-35	-80	-80	-125	-170	-170	-265	-310	-355	-400	-440	-640	-790	-970		-1 605	-2 205	nat.data
	D	1.000t CO2eq	-728	0	-802	-493	-275	0	0	0	-281	0	-1 324	-1 056	-632	0	-92	-710	-1 040	-1 290		-346	-346	nat.data
	Total	1.000t CO2eq	-111 843	-109 907	-110 842	-110 528	-110 310	-108 770	-108 485	-111 000	-111 551	-111 503	-115 989	-117 966	-123 087	-125 051	-123 732	-134 450	-133 830	-134 260	nat.data	-137 579	-136 896	nat.data
Emissions (+) from harvesting	FM	1.000t CO2eq	71 092	66 887	70 180	73 970	73 792	74 321	70 354	72 325	74 895	76 843	79 510	83 549	88 086	92 034	93 938	106 355	105 603	112 115	nat.data	112 089	111 656	nat.data
	AR	1.000t CO2eq	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-	NO	NO	
	D	1.000t CO2eq	1 488	1 010	1 912	1 753	1 405	2 010	1 500	1 140	1 461	2 000	1 784	1 486	1 212	1 420	1 422	1 650	1 650	1 650	nat.data	1 406	1 406	nat.data
	Total	1.000t CO2eq	72 580	67 898	72 092	75 723	75 197	76 331	71 854	74 155	76 356	78 843	81 294	85 034	89 298	93 454	95 360	108 005	108 543	113 765	nat.data	113 495	113 062	nat.data
Emissions (+) from natural disturbances	FM	1.000t CO2eq	18	17	17	17	17	17	18	101	5	35	34	35	55	68	64	818	790	456	UNFCCC/nat.data	31	31	nat.data
	AR	1.000t CO2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	D	1.000t CO2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	Total	1.000t CO2eq	18	17	17	17	17	17	18	101	5	35	34	35	55	68	64	818	790	456	UNFCCC/nat.data	31	31	nat.data
All other net emissions (incl. other pools)	FM	1.000t CO2eq	4 118	3 740	2 932	2 336	5 721	5 586	2 434	-920	-3 511	-2 731	-2 727	-2 674	-2 670	-3 405	-2 214	-2 210	-495	-2 531	UNFCCC	1 226	2 031	nat.data
	AR	1.000t CO2eq	-5	-5	-10	-15	-15	-20	-20	-25	-30	-30	-35	-40	-45	-50	-60	-60	-60	-80	nat.data	-195	-295	nat.data
	D	1.000t CO2eq	90	190	340	440	520	740	750	760	870	1 000	1 390	1 470	1 320	1 680	1 570	1 560	1 590	1 540	nat.data	2 220	2 220	nat.data
	Total	1.000t CO2eq	4 203	3 925	3 262	2 761	6 226	6 306	3 164	-185	-2 671	-1 761	-1 372	-1 244	-1 395	-1 775	-704	-710	1 035	-1 071	UNFCCC/nat.data	3 251	3 956	nat.data
Net-emissions without HWP	FM	1.000t CO2eq	-35 890	-39 373	-36 889	-33 694	-30 487	-28 993	-36 112	-39 695	-39 716	-38 088	-37 617	-35 725	-36 684	-36 771	-31 476	-28 196	-26 247	-21 988	UNFCCC	-22 313	-20 648	nat.data
	AR	1.000t CO2eq	-20	-20	-50	-50	-50	-100	-100	-150	-200	-200	-300	-350	-400	-450	-500	-700	-850	-1 050	nat.data	-1 700	-2 300	nat.data
	D	1.000t CO2eq	850	1 200	1 450	1 700	1 650	2 750	2 250	1 900	2 050	3 000	1 850	1 900	1 900	3 100	2 900	2 500	2 200	1 900	nat.data	3 300	3 300	nat.data
	Total	1.000t CO2eq	-35 060	-38 193	-35 489	-32 044	-28 887	-26 343	-33 962	-37 945	-37 866	-35 288	-36 067	-34 175	-35 184	-34 121	-29 076	-26 396	-24 897	-21 138	UNFCCC/nat.data	-20 713	-19 648	nat.data
Harvested wood products stock-change data																								
Stock-changes in HWP (SCAD)	FM	1.000t CO_2eq	-1 670	-320	680	1 360	1 300	-120	1 330	-30	740	1 020	-740	-910	-660	-750	70	-640	-60	-2 280	nat.data	-400	-320	nat.data
	AR	1.000t CO2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	D	1.000t CO2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	1.000t CO2eq	-1 670	-320	680	1 360	1 300	-120	1 330	-30	740	1 020	-740	-910	-660	-750	70	-640	-60	-2 280	nat.data	-400	-320	nat.data
Stock-changes in HWP (PA)	FM	1.000t CO2eq	-2 620	-480	-590	-1 850	-2 000	-2 730	-2 550	-3 050	-1 950	-1 240	-2 580	-2 310	-2 510	-2 940	-2 960	-5 060	-4 510	-4 930	nat.data	-4 630	-3 955	nat.data
	AR	1.000t CO2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	D	1.000t CO2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	1.000t CO2eq	-2 620	-480	-590	-1 850	-2 000	-2 730	-2 550	-3 050	-1 950	-1 240	-2 580	-2 310	-2 510	-2 940	-2 960	-5 060	-4 510	-4 930	nat.data	-4 630	-3 955	nat.data
Forest emissions and removals including harvested wood products data																								
Net-emissions with SCAD HWP	FM	1.000t CO_2eq	-37 560	-39 693	-36 209	-32 334	-29 187	-29 113	-34 782	-39 725	-38 976	-37 068	-38 357	-36 635	-37 344	-37 521	-31 406	-28 836	-26 307	-24 268	UNFCCC/nat.data	-22 713	-20 968	nat.data
	AR	1.000t CO2eq	-20	-20	-50	-50	-50	-100	-100	-150	-200	-200	-300	-350	-400	-450	-500	-700	-850	-1 050	nat.data	-1 700	-2 300	nat.data
	D	1.000t CO2eq	850	1 200	1 450	1 700	1 650	2 750	2 250	1 900	2 050	3 000	1 850	1 900	1 900	3 100	2 900	2 500	2 200	1 900	nat.data	3 300	3 300	nat.data
	Total	1.000t CO2eq	-36 730	-38 513	-34 809	-30 684	-27 587	-26 463	-32 632	-37 975	-37 126	-34 268	-36 807	-35 085	-35 844	-34 871	-29 006	-27 036	-24 957	-23 418	UNFCCC/nat.data	-21 113	-19 968	nat.data
Net-emissions with PA HWP	FM	1.000t CO2eq	-38 510	-39 853	-37 479	-35 544	-32 487	-31 723	-38 662	-42 745	-41 666	-39 328	-40 197	-38 035	-39 194	-39 711	-34 436	-33 256	-30 757	-26 918	UNFCCC/nat.data	-26 943	-24 603	nat.data
	AR	1.000t CO2eq	-20	-20	-50	-50	-50	-100	-100	-150	-200	-200	-300	-350	-400	-450	-500	-700	-850	-1 050	nat.data	-1 700	-2 300	nat.data
	D	1.000t CO2eq	850	1 200	1 450	1 700	1 650	2 750	2 250	1 900	2 050	3 000	1 850	1 900	1 900	3 100	2 900	2 500	2 200	1 900	nat.data	3 300	3 300	nat.data
	Total	1.000t CO2eq	-37 680	-38 673	-36 079	-33 894	-30 887	-29 073	-36 512	-40 995	-39 816	-36 528	-38 647	-36 485	-37 694	-37 061	-32 036	-31 456	-29 407	-26 068	UNFCCC/nat.data	-25 343	-23 603	nat.data

Article 3.4 – Cropland management and Grazing land management

AREA AND NET EMISSIONS UNDER CROPLAND AND GRAZING LAND MANAGEMENT

For carbon pools on cropland (Cropland management) and Grassland (Grazing land management) mean values for the latest reported years (2003-2007) have been used for the projection.

Variable	Activity	unit	Sweden																			Projected NR or NE		
			1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Source	2015	2020	Source
General Input data																								
Area under Cropland management	Total	1.000ha	3 056	3 042	3 030	3 014	3 005	2 996	2 984	2 976	2 965	2 949	2 936	2 923	2 909	2 898	2 957	2 919	3 026	2 991		2 958	2 973	
Area under Grazing land management	Total	1.000ha	470	464	459	454	447	441	435	429	427	420	416	407	398	389	378	402	412	407		398	400	
Net emissions data																								
Cropland management	Total	1.000t CO2eq	4 068	3 852	3 660	3 882	3 640	3 672	4 014	3 598	4 150	4 123	3 111	4 198	3 692	2 836	2 808	2 747	2 897	2 811		3 100	3 100	
Grazing land management	Total	1.000t CO2eq	-519	-494	-440	-412	-449	-420	-395	-535	-651	-819	-439	-496	-523	-173	-603	-518	-1 195	-563		-500	-500	

UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND

Forest data – Article 3.3 activities (Afforestation, Reforestation, Deforestation) and Article 3.4 Forest management

GENERAL INPUT DATA - FOREST AREA, HARVESTING AND AREA AFFECTED BY NATURAL DISTURBANCES.

Area units are 1000 hectares (kha). Harvesting units are 1000 tonnes of m^3 overbark.

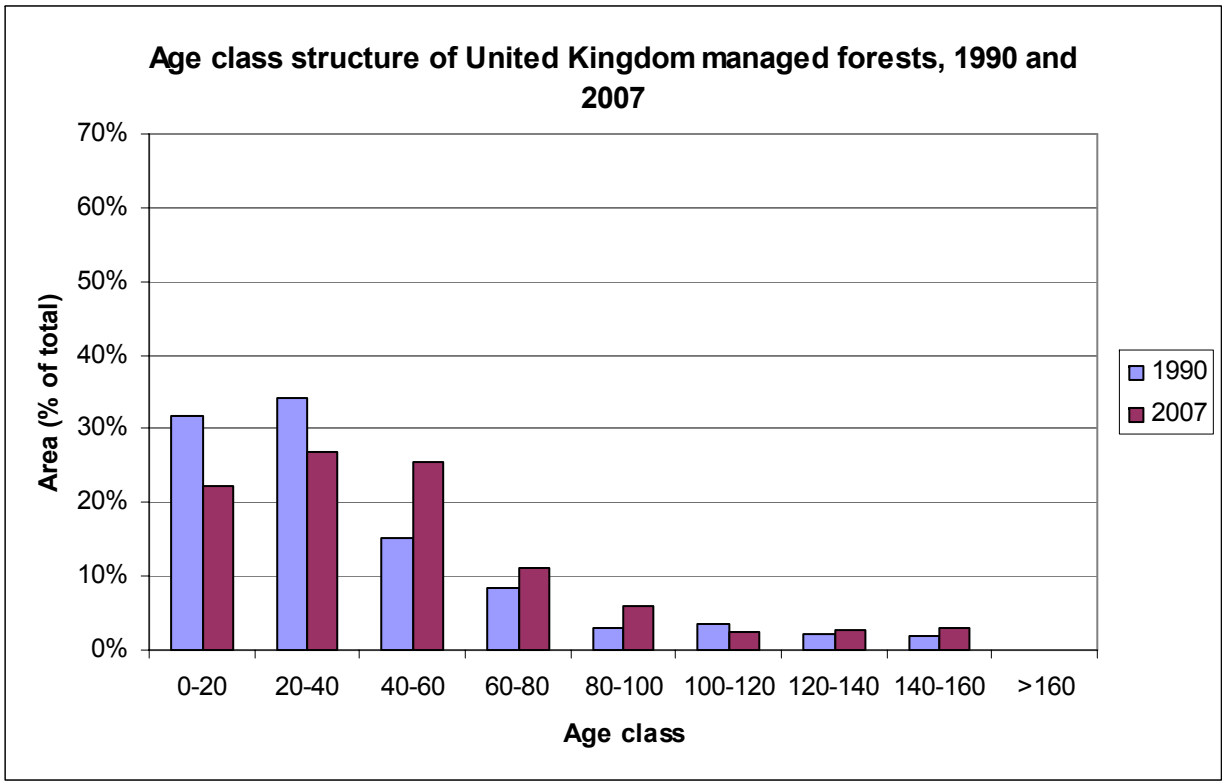
FOREST AREA

The forest areas reported here are those published in the UK's National Inventory report under 5A (Forest Land). The area reported for FM includes the area reported for KP Forest Management (forest planted between 1921 and 1989) and forest pre-dating 1920 (c. 822 kha in 1990). The Afforestation/Reforestation area is land that has been converted to forested land since 1990 (inclusive). In the UK Land converted to Forest Land is considered to stay in that category beyond the 20 year default period in order to take account of the long term soil carbon dynamics. Deforestation since 1990 is the land area permanently converted from forest land. All ARD and FM definitions are consistent with those used in the UNFCCC inventory.

The afforestation datasets are provided by the Forestry Commission and the Forest Service of Northern Ireland (the national forest agencies). . Information on deforestation activities is assembled from data from the Forestry Commission and the Ordnance Survey (the national cartographic agency) through the UK government.

Projections of afforestation to 2015 and 2020 assume annual planting to continue at the same rate as in 2007 (8.2 kha/year). Projections of deforestation use an autoregressive model with 10 terms fitted to the 1990-2007 data to project forward to 2015 and 2020.

AGE CLASS STRUCTURE



The forest age class structure is derived from national published sources. The National Inventory of Woodland and Trees (NIWT 1995-99) recorded the area of woodland in Great Britain by planting year classes from pre-1861 to 1990 (Table 1.8 Forestry Statistics 2007 http://www.forestry.gov.uk/forestry/infd-7aqdgc). Planting year classes were constructed for Northern Ireland based on planting information since 1900 (assuming 10%of conifer planting 1900-56 was still standing today and restocking took place on a 57 year rotation). The area of pre-1990 woodland in Northern Ireland is only 2.4% of the UK total so the differences in method will not significantly affect the overall age structure. The post-1991 age class for NIWT does not extend to 2007 so this age class was estimated from published new planting and restocking totals (Table 1.12 in Forestry Statistics). Most of the UK's forest area was planted in the second half of the 20th century but the planting rate has slowed since 1990.

The NIWT age classes were assigned to the age class structure shown here as shown in the table below.

	1990		2007	
Age class	**Equivalent time period**	**Mapping of NIWT age classes**	**Equivalent time period**	**Mapping of NIWT age classes**
0-20	1971-1990	1971-1980 + 1981-1990	1988-2007	Area planted since 1991 + (0.3 * 1981-1990)
20-40	1951-1970	1951-1960 + 1961-1970	1968-1987	(0.3 * 1961-1970) + 1971-1980 + (0.7 * 1981-1990)
40-60	1931-1950	1931-1940 + 1941-1950	1948-1967	(0.3 * 1941-1950) + 1951-1960 +(0.7 * 1961-1970)
60-80	1911-1930	1911-1920 + 1921-1930	1928-1947	(0.3 * 1921-1930) +1931-1940 + (0.7 * 1941-50)
80-100	1891-1910	(0.25 * 1861-1900) + 1901-1910	1908-1927	(0.3 * 1901-1910) + 1911-1920 + (0.7 * 1921-1930)
100-120	1871-1890	0.5 * 1981-1900	1888-1907	(0.3 * 1861-1900) + (0.7 * 1901-1910)
120-140	1851-1870	(0.2 * pre-1861) + (0.25 * 1861-1900)	1868-1887	0.5 * 1861-1900
140-160	1831-1850	0.8 * pre-1861	1848-1867	0.2 * 1861-1900 + pre-1861
>160	Pre-1830	Included in 140-160 age class	Pre-1847	Included in 140-160 age class

HARVESTING

The dynamic carbon flow model used by the UK to calculate figures for the UNFCCC and KP inventory produces estimates of carbon in harvested wood products not m^3 of timber. Therefore the numbers given in the spreadsheet (for harvesting in the FM area) are compiled from wood production reported by the Forestry Commission (Table 2.1 in Forestry Statistics http://www.forestry.gov.uk/forestry/infd-7aqdgc, sources are described in http://www.forestry.gov.uk/website/forstats2009.nsf/0/64E107535A9AA2DC8025736700308566). These production figures are reported as 000 m^3 overbark for 1990 and 1994 and as 000 green tonnes for 1995-2007. Conversion factors of 1.1 for softwood and 1.0 for hardwood were used to convert green tonnes in m3 overbark as recommended in Forestry Statistics (http://www.forestry.gov.uk/website/forstats2009.nsf/0/8B4784E90B2A535480257361005015C6). Production figures for 1991-1993 were interpolated between 1990 and 1994.

It is assumed that no harvesting has taken place on the AR forest between 1990 and 2007. Harvested timber produced from deforestation activities is included under the timber from FM harvesting.

Projected figures for harvesting come from the softwood availability forecast in Forestry Statistics 2009 (Table 2.5), which forecast annual averages of softwood availability for 2012-2016 and 2017-2021. No forecasts are available for hardwood products but these are a small fraction of overall UK timber production (<5%).

NATURAL DISTURBANCES

Area affected by forest fires: the figures reported here are those reported for wildfires in table 5(V) in the UK's UNFCCC inventory. Estimates of the area burnt are collated from various published sources (Global Forest Resources Assessment 2005, Forestry Statistics 2004, FAO/ECE Forest Fire Statistics 1999-2001) and originate from the national forest agencies (Forestry Commission and Forest Service of Northern Ireland). Details of the method are reported in the UK's NIR. It is not possible to separate fires that occurred on FM land and those that occurred on AR land, so all fires are reported under FM. It is assumed that there are no forest fires on deforested land (the controlled burning reported in table 5(V) is not a natural disturbance). Projections of wildfires use an autoregressive model with 10 terms fitted to the 1990-2007 data to project forward to 2015 and 2020.

Area affected by storms: An annual estimate of 5.5 kha of blown woodland in the UK is reported in the Global Forest Resource Assessment 2010. It is not possible to separate FM and AR areas affected by storms, so all storm damage is reported under FM. There is very little data on the area of woodland damaged by storms over time so the annual estimate is projected to 2015 and 2020.

Area affected by other disturbances: This includes disturbance by diseases, insect pests and other biotic agents. An annual estimate of 4 kha of affected woodland in the UK is reported in Global Forest Resource Assessment 2010. It is not possible to separate FM and AR areas affected, so all damage is reported under FM. There is very little data on the area of woodland damaged by other disturbances over time so the annual estimate is projected to 2015 and 2020.

FOREST EMISSIONS AND REMOVALS DATA

Emission and removal units are 1000 tonnes CO_2 equivalent (kt or Gg).

Living biomass gains: The figures for FM and AR are the gains in living biomass as reported in the UNFCCC inventory (emissions under 5A2 Land converted to Forest Land are equal to those reported for Forest Management and Afforestation/Reforestation in the Kyoto Protocol reporting tables). Living biomass gains for Deforestation are included in "All other net emissions". Projections to 2015 and 2020 are made using the projected area data (described above) with the UK's inventory models.

Emissions from harvesting: The dynamic carbon flow model used by the UK for estimating carbon fluxes in forests takes account of emissions produced by forest establishment, management and harvesting and produces the figures required for the UNFCCC and KP inventories. These numbers cannot be split to give emissions solely from harvesting so these emissions are contained in the net removals reported in the spreadsheet. The figures reported for Deforestation are the emissions of CO_2, CH_4 and N_2O from controlled burning during deforestation (as reported in the Kyoto Protocol reporting tables).

Emissions from disturbances: Emissions from wildfires on FM land are reported here. These include emissions of carbon dioxide, methane and nitrous oxide. Emissions from wildfires of AR land are included under FM emissions. It is assumed that there are no forest fires on deforested land and therefore no emissions.

Projections to 2015 and 2020 are made using the projected area data described above with the default emission factors. Emissions from other natural disturbances are not estimated for the UK, but are assumed to be implicitly included in the national emissions and removals. No unusual events took place during the reporting period (the last catastrophic storm with a widespread impact in the UK was in 1987).

All other net emissions (including other pools): These include the other emissions and removals (losses of living biomass, net carbon stock change in dead organic matter and net carbon stock change in soils) as reported in reported in the UNFCCC inventory and Kyoto Protocol reporting tables. Projections to 2015 and 2020 are made using the projected area data (described above) with the UK's inventory models. The UK's projections have been reviewed as part of its 5th National Communication.

HARVESTING WOOD PRODUCTS STOCK CHANGE DATA.

The SCAD method is not used in the UK so no estimates have been produced.

The UK uses its carbon accounting model to estimate net changes in the harvested wood products pool, as an extension of the method to calculate carbon stocks in 5A Forest Land (a full description is given in the UK's NIR). Thinnings (from forest management activities) and harvested materials are assumed to enter the HWP stock pool where they decay at different rates. The residence time values (time spent in the HWP pool) fall within the range specified in the LULUCF GPG (IPCC 2003) for paper and sawn products. Imported timber products are not included. This top-down approach is analogous to the Production Approach described in the IPCC Guidelines (2006).

According to this method the total HWP pool from UK forests is presently increasing, driven by historical expansion in the forest area and subsequent management thinning and harvesting. The stock of carbon in HWP in FM forests has been increasing since 1990 but a recent dip in the rate of change between 2000 and 2004 reflected a severe dip in forest planting during the 1940s. The HWP pool has now returned to being an increasing sink, which is forecast to continue to 2020, driven by high planting rates during the 1950s-1980s. The figures in the spreadsheet (row51-54) are carbon stock changes (+ for increases in stocks, - for decreases in stocks). These are converted into emissions/removals (*-1) when added to the forest emissions and removals (row 60-63).

The UK's projections have been reviewed as part of its 5th National Communication. These estimates and projections of harvested wood products are not currently linked to timber production and forecast availability as reported by the UK Forestry Commission.

Variable	Activity	unit	United Kingdom Historic																			Projected		
			1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Source	2015	2020	Source
General Input data																								
Forest Area	FM	1.000ha	2 222	2 221	2 219	2 217	2 216	2 215	2 213	2 212	2 210	2 208	2 205	2 202	2 199	2 196	2 193	2 191	2 188	2 186	national data	2 170,910	2 162,782	National data
	AR	1.000ha	21	41	59	78	97	117	133	150	167	184	201	219	233	246	258	269	278	288	national data	369,263	420,213	National data
	D	1.000ha	1	2	2	3	4	4	5	6	7	8	9	11	13	14	15	17	18	19	national data	26,630	30,694	National data
	Total	1.000ha	2 244	2 263	2 281	2 299	2 317	2 336	2 352	2 368	2 384	2 400	2 416	2 433	2 445	2 456	2 467	2 477	2 484	2 493	national data	2 566,803	2 613,689	National data
Harvesting	FM	1.000m^3ob	7 120	7 470	7 820	8 170	8 520	8 008	7 928	8 293	8 225	8 683	8 827	8 886	9 015	9 713	9 889	9 927	9 800	10 358	National data	12 423	13 178 y.	National data
	AR	1.000m3ob	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Assumed no harvesting 1990-2007	IE	IE	Included in FM.
	D	1.000m3ob	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	Included in FM total	IE	IE	Included in FM.
	Total	1.000m3ob	7 120	7 470	7 820	8 170	8 520	8 008	7 928	8 293	8 225	8 683	8 827	8 886	9 015	9 713	9 889	9 927	9 800	10 358	National data	12 423	13 178 y.	National data
Natural Disturbances data																								
Area Affected by Forest Fires	FM	1.000ha	0,648	1,100	0,273	0,470	0,368	2,861	1,441	1,859	1,024	0,158	0,550	0,728	0,599	0,510	0,637	0,124	1,529	1,706	national data	0,555	0,810	National data
	AR	1.000ha	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	Included in FM total	IE	IE	Included in FM
	D	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Not occurring.	-	-	Not occurring
	Total	1.000ha	0,648	1,100	0,273	0,470	0,368	2,861	1,441	1,859	1,024	0,158	0,550	0,728	0,599	0,510	0,637	0,124	1,529	1,706	national data	0,555	0,810	national data
Area Affected by Storms	FM	1.000ha	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	national data in GFRA2010	6,000	6,000	National data
	AR	1.000ha	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	Included in FM total	-	-	Included in FM
	D	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Not occurring	-	-	Not occurring
	Total	1.000ha	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	national data in GFRA2010	-	-	national data
Area Affected by Other Disturbance	FM	1.000ha	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	national data in GFRA2010	4,000	4,000	National data
	AR	1.000ha	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	Included in FM total	-	-	Included in FM
	D	1.000ha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Not occurring	-	-	Not occurring
	Total	1.000ha	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	national data in GFRA2010	4,000	4,000	national data
Forest emissions and removals data																								
Living Biomass Gains	FM	1.000t CO_2eq	-33 077	-33 591	-34 097	-34 462	-34 716	-34 712	-34 716	-34 806	-34 901	-35 014	-35 010	-35 194	-35 470	-35 746	-36 043	-35 996	-36 175	-36 252	national data	-34 394	-32 690	national data
	AR	1.000t CO2eq	-148	-314	-538	-829	-1 203	-1 613	-2 036	-2 442	-2 823	-3 182	-3 522	-3 833	-4 129	-4 411	-4 677	-4 914	-5 140	-5 342	national data	-7 548	-9 114	national data
	D	1.000t CO2eq	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	Included in net other emissions	IE	IE	other emissions
	Total	1.000t CO2eq	-33 226	-33 905	-34 635	-35 292	-35 919	-36 326	-36 752	-37 248	-37 724	-38 196	-38 532	-39 027	-39 599	-40 157	-40 719	-40 910	-41 315	-41 594	national data	-41 942	-41 804	national data
Emissions (+) from harvesting	FM	1.000t CO2eq	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	Included in FM other net emissions	IE	IE	r net emissions
	AR	1.000t CO2eq	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	Included in AR other net emissions	IE	IE	r net emissions
	D	1.000t CO2eq	149	141	134	119	122	113	131	137	137	196	249	302	261	255	233	229	202	187	National data.	160	135	National data.
	Total	1.000t CO2eq	149	141	134	119	122	113	131	137	137	196	249	302	261	255	233	229	202	187	National data	160	135	National data
Emissions (+) from natural disturbances	FM	1.000t CO2eq	52	87	22	39	31	242	126	165	91	14	50	70	59	50	66	14	161	184	national data	62	86	national data
	AR	1.000t CO2eq	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	Included in FM emissions.	IE	IE	n FM emissions.
	D	1.000t CO2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Not occurring	-	-	Not occurring
	Total	1.000t CO2eq	52	87	22	39	31	242	126	165	91	14	50	70	59	50	66	14	161	184	National data	62	86	National data
All other net emissions (incl. other pools)	FM	1.000t CO2eq	20 846	20 700	20 548	20 623	20 568	21 042	21 518	22 078	22 508	22 737	22 627	22 433	22 177	22 054	21 889	22 590	23 437	24 568	national data	30 134	31 929	nationa; data
	AR	1.000t CO2eq	146	401	619	818	1 010	1 197	1 368	1 534	1 695	1 858	2 032	2 185	2 300	2 397	2 489	2 566	2 635	2 700	national data	4 137	5 054	national data
	D	1.000t CO2eq	244	247	252	245	263	262	302	322	333	432	522	612	559	558	531	533	499	482	national data	484	464	national data
	Total	1.000t CO2eq	21 236	21 349	21 419	21 685	21 842	22 501	23 188	23 935	24 537	25 027	25 181	25 230	25 036	25 009	24 909	25 689	26 570	27 751	national data	34 755	37 447	national data
Net-emissions without HWP	FM	1.000t CO2eq	-12 179	-12 804	-13 526	-13 801	-14 117	-13 429	-13 072	-12 563	-12 301	-12 263	-12 333	-12 692	-13 235	-13 642	-14 088	-13 391	-12 577	-11 500	national data	-4 198	-675	national data
	AR	1.000t CO2eq	-3	87	81	-12	-193	-417	-668	-908	-1 128	-1 324	-1 490	-1 648	-1 829	-2 014	-2 188	-2 348	-2 506	-2 642	national data	-3 411	-4 059	national data
	D	1.000t CO2eq	393	388	386	364	386	376	433	460	471	627	770	914	820	813	764	762	701	669	national data	644	598	national data
	Total	1.000t CO2eq	-11 789	-12 328	-13 059	-13 448	-13 924	-13 470	-13 306	-13 011	-12 959	-12 960	-13 052	-13 426	-14 244	-14 843	-15 512	-14 977	-14 382	-13 473	national data	-6 965	-4 136	national data
Harvested wood products stock-change data																								
Stock-changes in HWP (SCAD)	FM	1.000t CO_2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
	AR	1.000t CO2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
	D	1.000t CO2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
	Total	1.000t CO2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
Stock-changes in HWP (PA)	FM	1.000t CO2eq	-1 456	-1 210	-920	-842	-633	-900	-1 021	-1 197	-1 306	-1 268	-950	-445	47	337	620	97	-355	-1 133	national data	-3 897	-4 401	national data
	AR	1.000t CO2eq	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	national data	-208	-252	national data
	D	1.000t CO2eq	-226	-206	-189	-161	-160	-141	-164	-168	-163	-245	-318	-389	-314	-295	-251	-238	-189	-160	national data	-89	-40	national data
	Total	1.000t CO2eq	-1 682	-1 416	-1 109	-1 003	-793	-1 041	-1 185	-1 365	-1 468	-1 513	-1 268	-834	-267	42	368	-140	-544	-1 293	national data	-4 193	-4 693	national data
Forest emissions and removals including harvested wood products data																								
Net-emissions with SCAD HWP	FM	1.000t CO_2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	AR	1.000t CO2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	D	1.000t CO2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	Total	1.000t CO2eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
Net-emissions with PA HWP	FM	1.000t CO2eq	-10 723	-11 594	-12 607	-12 959	-13 485	-12 529	-12 051	-11 366	-10 995	-10 995	-11 383	-12 247	-13 282	-13 980	-14 708	-13 489	-12 222	-10 367	national data	-302	3 726	national data
	AR	1.000t CO2eq	-3	87	81	-12	-193	-417	-668	-908	-1 128	-1 324	-1 490	-1 648	-1 829	-2 014	-2 188	-2 348	-2 506	-2 642	national data	-3 203	-3 807	national data
	D	1.000t CO2eq	619	594	575	524	546	517	597	628	633	872	1 088	1 303	1 134	1 108	1 015	999	890	828	national data	732	639	national data
	Total	1.000t CO2eq	-10 107	-10 912	-11 951	-12 446	-13 131	-12 429	-12 121	-11 646	-11 490	-11 446	-11 784	-12 591	-13 977	-14 886	-15 880	-14 837	-13 837	-12 180	national data	-2 772	557	national data

Article 3.4 – Cropland management

AREA UNDER CROPLAND MANAGEMENT

The UK has not elected to report Article 3.4 Cropland Management under the Kyoto Protocol. Therefore estimates of the area and emissions of Cropland Management are derived from the UK's UNFCCC greenhouse gas inventory.

The UK reports areas of land use categories and changes between these categories in the NIR (the land use transition matrices in section 7.1). The area under Cropland Management is taken to be the total area in the 5B Cropland land use category. The areas under different land use categories are derived from the national Countryside Survey (see NIR for further details). These surveys were undertaken in 1990 and 1998, and annual land use change between categories is based on the changes in land use between these two surveys. A recent survey was undertaken in 2007 but the results have not yet been completely published and included in the inventory method. Therefore the areas of Cropland between 1999 and 2007 are likely to change in the near future. The projected areas in 2015 and 2020 are estimated by extending the trendline from 1990-2007 (based on the rate of change between 1990 and 1998). These projections are likely to change once the data from the 2007 Countryside Survey becomes available.

NET EMISSIONS FROM CROPLAND MANAGEMENT

The UK estimates emissions/removals from various activities under 5B1 Cropland remaining Cropland (liming, yield improvement, lowland drainage) and emissions/removals resulting from land use conversion between land use categories (carbon stock changes in living biomass and net carbon stock change in soils). In the UK land converted to Cropland (5B2) is considered to stay in that category beyond the 20 year default period to take account of the long-term soil carbon dynamics. Full details of methods are given in the NIR.

The UK has historical data on land use change and is able to estimate emissions and removals from changes that occurred before and after 1990. Emissions/removals resulting from Cropland Management are considered to include activities in 5B1 Cropland remaining Cropland and land converted to Cropland (5B2).

Cropland Management = CC + pre-1990 GC + pre-1990 SC + pre-1990 FC + post-1990 GC + post-1990 SC

Where *CC* is Cropland remaining Cropland, *GC* is Grassland converted to Cropland, *SC* is Settlement converted to Cropland, *FC* is Forestland converted to Cropland.

The net emissions and projections under Cropland management are the sum of these components in the UK's UNFCCC inventory. Post-1990 conversion of forest to cropland does not occur in the UK so the numbers presented for Cropland Management match those for 5B Cropland in the UK's UNFCCC inventory. The UK's projections have been reviewed as part of its 5th National Communication.

ARTICLE 3.4 – GRAZING LAND MANAGEMENT

AREA UNDER GRAZING LAND MANAGEMENT

The UK has not elected to report Article 3.4 Grazing Land Management under the Kyoto Protocol. Therefore estimates of the area and emissions of Grazing Land Management are derived from the UK's UNFCCC greenhouse gas inventory.

The UK reports areas of land use categories and changes between these categories in the NIR (the land use transition matrices in section 7.1). The area under Grazing Land Management is taken to be the total area in the 5C Grassland land use category. The areas under different land use categories are derived from the national Countryside Survey (see NIR for further details). These surveys were undertaken in 1990 and 1998, and annual land use change between categories is based on the changes in land use between these two surveys. A recent survey was undertaken in 2007 but the results have not yet been completely published and included in the inventory method. Therefore the areas of Grassland between 1999 and 2007 are likely to change in the near future. The projected areas in 2015 and 2020 are estimated by extending the trendline from 1990-2007 (based on the rate of change between 1990 and 1998). These projections are likely to change once the data from the 2007 Countryside Survey becomes available.

NET EMISSIONS FROM GRAZING LAND MANAGEMENT

The UK estimates emissions/removals from various activities under 5C1 Grassland remaining Grassland (liming, peat extraction for horticultural use) and emissions/removals resulting from land use conversion between land use categories (carbon stock changes in living biomass and net carbon stock change in soils). In the UK land converted to Grassland (5C2) is considered to stay in that category beyond the 20 year default period to take account of the long-term soil carbon dynamics. Full details of methods are given in the NIR.

The UK has historical data on land use change and is able to estimate emissions and removals from changes that occurred before and after 1990. Emissions/removals resulting from Grazing Land Management are considered to include activities in 5C1 Grassland remaining Grassland and land converted to Grassland (5C2).

Grassland Management = GG + pre-1990 CG + pre-1990 SG + pre-1990 FG + post-1990 CG + post-1990 SG

Where *GG* is Grassland remaining Grassland, *CG* is Cropland converted to Grassland , *SG* is Settlement converted to Grassland, *FG* is Forestland converted to Grassland.

The net emissions and projections under Grassland management are the sum of these components in the UK's UNFCCC inventory. Post-1990 conversion of forest to grassland is not included because this would fall under Article 3.3 Deforestation. The UK's projections have been reviewed as part of its 5th National Communication.

Variable	Activity	unit	United Kingdom Historic																			Projected		
			1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Source	2015	2020	Source
General Input data																								
Area under Cropland management	Total	1.000ha	5 468	5 478	5 487	5 496	5 505	5 514	5 523	5 533	5 542	5 551	5 561	5 570	5 579	5 588	5 598	5 607	5 617	5 627	national data	5 700	5 746	National data
Area under Grazing land management	Total	1.000ha	13 220	13 180	13 141	13 104	13 067	13 031	12 992	12 957	12 922	12 886	12 851	12 816	12 781	12 749	12 718	12 688	12 658	12 631	national data	12 334	12 160	national data
Net emissions data																								
Cropland management	Total	1.000t CO2eq	15 822	15 978	15 983	15 566	15 618	15 750	15 788	15 530	15 418	15 321	15 339	15 287	15 313	15 384	15 316	15 233	15 279	15 288	National data	15 254	15 223	National data
Grazing land management	Total	1.000t CO2eq	-6 224	-6 576	-6 688	-7 090	-7 139	-7 145	-7 328	-7 366	-7 668	-7 864	-8 095	-8 215	-8 328	-8 319	-8 450	-8 559	-8 648	-8 779	national data	-9 445	-9 827	national data

Note: In the spreadsheet the sum of emissions from Forest Management, Cropland Management and Grazing Land Management will not equal total LULUCF emissions published in the UK's inventory and 5th National Communication because 5E Settlements are not included. However, all figures have been cross-checked and are consistent with those in the inventory and 5NC.

ADDITIONAL METHODOLOGICAL INFORMATION RELATED TO JRC PROJECTIONS FOR ARTICLE 3.3 AND ARTICLE 3.4 ACTIVITIES

Projections provided by the JRC (Joint Research Centre of the European Commission) are preliminary results of a project involving independent EU modelling groups coordinated by the Joint Research Centre and the European Commission General Directorate of Environment (DG ENV). The groups involved include IIASA, EFI, Univ. Hamburg and Boku University, which used different models (see below) to estimate emissions and removals for the main LULUCF activities up to 2020. The work builds on the latest (2009) baseline projections for key drivers (GDP, population, bioenergy demand, etc.) produced for each EU country by the Directorate General of Transport and Energy of the European Commission (DG TREN). For this submission, projections related to Forest Management obtained using the model EFISCEN are presented. The general modeling framework is summarized below together with a short description of the different models involved.

General modelling framework

To produce consistent projections on LULUCF at country level, a number of different forest, agricultural and economic land use models communicate as shown in the Figure 1 below. The economic land use models EUFASOM and GLOBIOM use as macro-economic drivers recent baseline projections by DG TREN for future energy demand and related assumptions on population growth, economic development (GDP), and technical progress rates. Data on potential yields and GHG emissions and removals for diverse agricultural and forest management alternatives are derived from the more detailed forestry models (G4M, OSKAR/FORMICA and EFISCEN) and the agricultural model (EPIC). For baseline and policy scenarios, the economic land use models project domestic production and consumption, net exports and prices of wood and agricultural products and changes in land use for EU member states (EUFASOM) and other world regions (GLOBIOM).

For the purpose of this work, historical values for the areas under each KP LULUCF activity were estimated by the JRC from the latest country' submissions to UNFCCC (including voluntary KP LULUCF submissions when available). Given that UNFCCC reporting differs from KP reporting, a number of assumptions were applied, as described in Table 1 below. These values were used as input to the models for the period 1990 to 2007.

Furthermore, to make the results of these models comparable (in absolute levels) with historical data, the net emissions estimated by the models for the entire time series (1990-2020) was "calibrated" with historical data submitted by countries to UNFCCC[13].

[13] Calibration, in this context, means that – for each model and each country – the absolute difference between average model results for historical period (before 2007) and the average country data for the same period is subtracted to the model results for the whole time series (till 2020).

FIGURE 1: general flowchart of information exchange between models

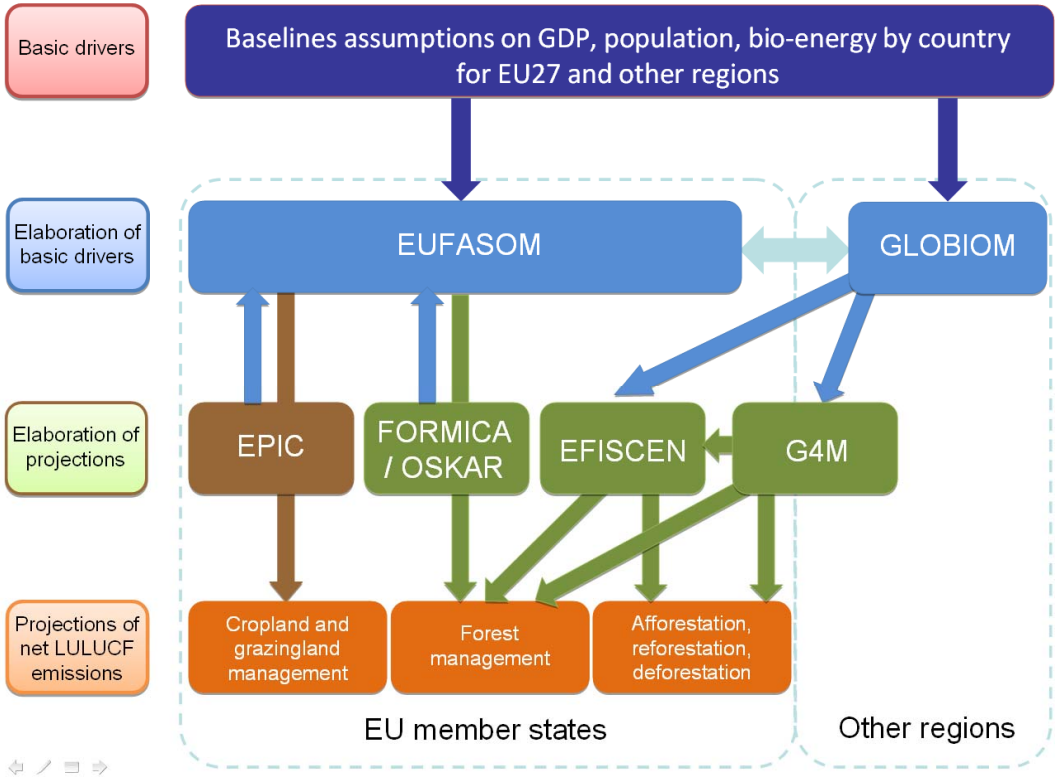


Table 1: Approach used to estimate areas of AR, D and FM for the years between 1990 and 2007 starting from data in the inventories submitted to UNFCCC.

Area of AR or D (k ha) in year x =	Is data on area of L→FL or FL→other available in the latest country's submission to UNFCCC (and is it reasonably consistent with other info on forest area in CRF tables) ?	Yes	IF the time series starts in 1990: AR: Area of L→FL in year x ; D: Area of FL→other in year x
			IF the time series starts before 1990: AR: ((area L→FL in year x) / length conversion period) * (year x - 1989); D: ((area FL→other in year x) / length conversion period) * (year x -1989)
		No	(Total area FL in year 2007 - total area FL in 1990)/17. This gives an average rate (kha /yr) of AR (if the values is positive) or D (if the value is negative). The total in a given year (k ha) is then obtained by summing consecutive years. Of course, this approach gives a net change in forest area, which likely underestimates land use changes.
Area of FM (k ha) in year x =	We first calculated FM area in 1989 as: (total FL in 1990) - (annual rate of AR in 1990) + (annual rate of D in 1990). Annual rates of AR and D were calculated from the estimates obtained as described above. Then, for each successive year x, FM area was calculated as (area FM year x-1) - (annual area D in the year x). We assumed that all D occurs on FM area.		

Description of the models

EPIC: The Environmental Policy Integrated Climate (EPIC) Model integrates a large number of biophysical processes and is used to compare land management systems and their effects on water, nitrogen, phosphorus, and green house gas emissions. It delivers the technical potential of mitigation on croplands and grasslands to EU-FASOM.

OSKAR/FORMICA: The models OSKAR and FORMICA calculate carbon pool trajectories under current and changing forest management in existing forests at a regional scale. They deliver plot level carbon trajectories to EUFASOM.

G4M: The Global Forest Model (G4M) provides spatially explicit estimates of annual aboveground wood increment, development of aboveground forest biomass and costs of forestry options such as forest management, afforestation and deforestation by comparing the income of alternative land use.

EFISCEN: the European Forest Information Scenario (EFISCEN) model is a large-scale, forest resource model that projects forest resource development on regional to European scale. The core of the model was developed in the late 1980s, as a forest resource projection model for Sweden; the last version is EFISCEN 3.1.3 released in 2007.

EUFASOM: EUFASOM is a partial equilibrium model used for long term assessment of the economic, technical and environmental potentials of land use options in Europe under different market and environmental conditions and policies.

GLOBIOM: GLOBIOM is a global static partial equilibrium model integrating the agricultural, bioenergy and forestry sectors with the aim to give policy advice on global issues concerning land use competition between the major land-based production sectors.

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ADDITIONAL METHODOLOGICAL INFORMATION ON PROJECTIONS FOR HARVESTED WOOD PRODUCTS

The methodology used for the estimated data on net-emissions presented in this paper was provided by 2006 IPCC Guidelines. For estimating net-emissions due to annual stock-change of HWP pool, Equation 12.1.A has been used.

$$C\,(i+1) = e^{-k} \bullet C\,(i) + \left[\frac{(1-e^{-k})}{k}\right] \bullet Inflow\,(i)$$

Where:

i = year (starting with 1900)

C (i) = the carbon stock of the HWP pool in the beginning of year i, Gg C

k = decay constant of first-order decay given in units, yr^{-1} (k = ln(2) / HL, where HL is half-life of the HWP pool in years. A half-life is the number of years it takes to lose one-half of the material currently in the pool.)

Inflow (i) = the inflow to the HWP pool during year i, Gg C yr^{-1}

Following conversion factors have been used:

Classification		Abbreviation	Air dry density	Con. factor	Source
UNECE	FAO		[g/cm³]	[Gg C/1000m³]	
1866	1.2.C	INRWD (C) +	0,450	2,25E-01	Kollmann (1982), EI/BU
1867	1.2.NC	INRWD (NC) +	0,670	3,35E-01	Kollmann (1982), EI/BU
1632	5.C	SWNWD (C) +	0,450	2,25E-01	Kollmann (1982), EI/BU
1633	5.NC	SWNWD (NC) +	0,670	3,35E-01	Kollmann (1982), EI/BU
1634	6.1	VENEER SHEETS	0,590	2,95E-01	IPCC (2003)
1640	6.2	PLYWOOD	0,480	2,40E-01	IPCC (2003)
1646	6.3	PARTICLE BOARD	0,642	2,95E-01	Hasch (2002)
1649	6.4.x	FIBREBOARD, COM	0,645	2,87E-01	Kollmann (1982)
1647	6.4.1	HARDBOARD	0,835	3,68E-01	Kollmann (1982)
1648	6.4.2	MDF	0,724	3,26E-01	Hasch (2002)
1650	6.4.3	INSULATING BOARD	0,278	1,23E-01	Kollmann (1982)
1876	10	PAPER+PAPERBOARD	0,800	3,60E-01	Kollmann (1982)

PROJECTIONS FOR HARVESTED WOOD PRODUCTS

The projections are intended to estimate potential scale of HWP accounting and illustrate potential impact when applying following proposed accounting options:

a) Absolute net-emissions due to stock changes in accounting period (CP2), discount factor 85%
b) Reference base year 1990 (1)
c) Reference base period 2001-2005 (2)
d) Reference base period 2008-2012 (CP1) (part of scenario)

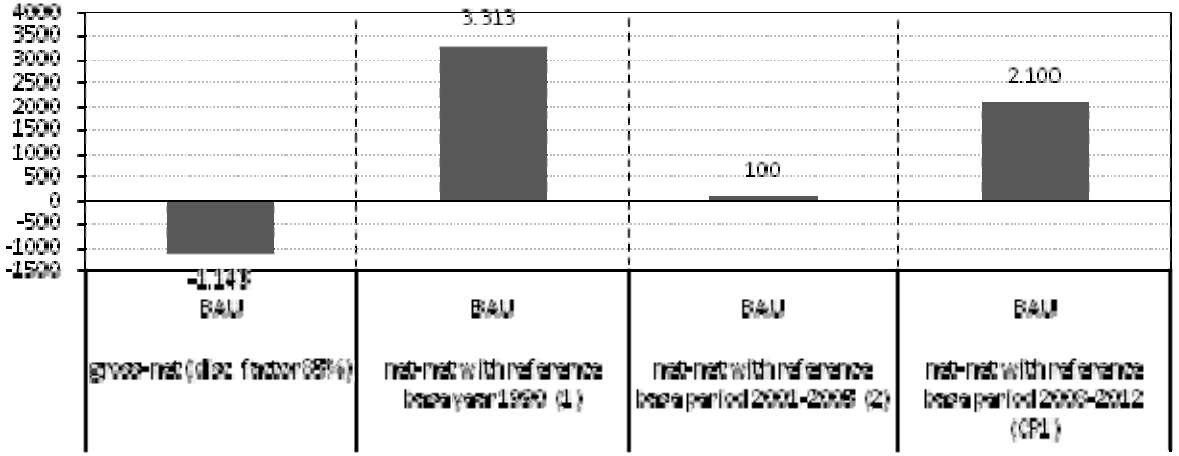
ILLUSTRATION OF PROJECTIONS FOR EU 27

In order to illustrate better the potential scale of HWP accounting, the following charts show results for the sum of projected net-emissions for each EU Member State for a) domestically produced and consumed HWP from domestic harvest (SCAD) and b) domestically produced HWP from domestic harvest (PA).

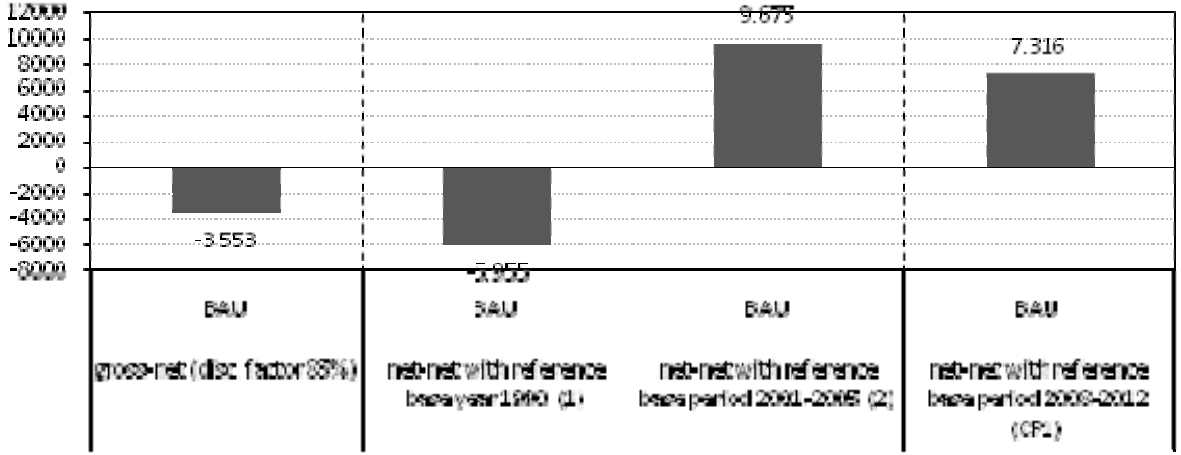
PROJECTION A

The projections assume stable *Inflow* of domestically produced or domestically produced and consumed HWP to the pool until 2020 (BAU: constant *Inflow* until 2020 (growth = 0,00%) based on average of last 5 years of *Inflow*, starting from 2009).

Annual HWP contribution according to accounting options (SCAD) [in Gg CO_2]



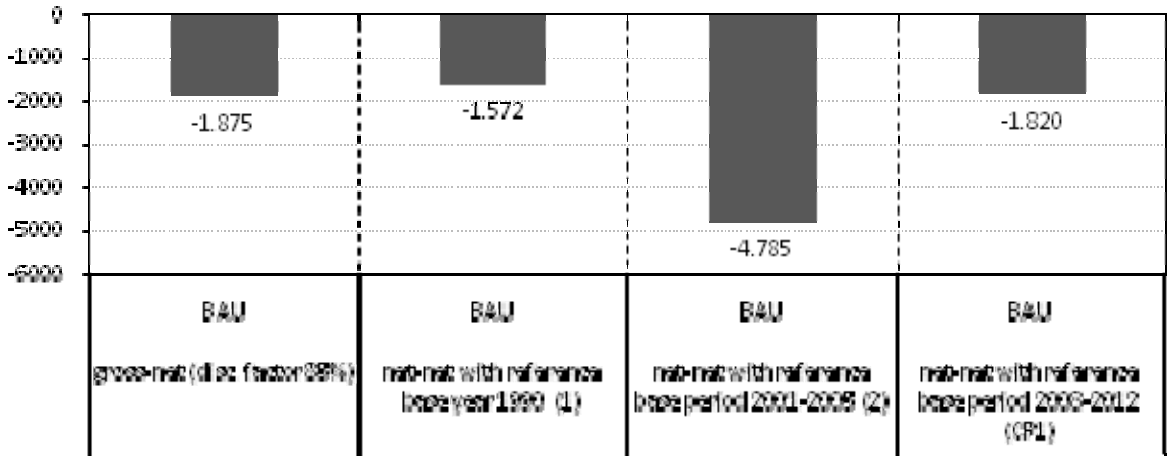
Annual HWP contribution according to accounting options (PA) [in Gg CO_2]



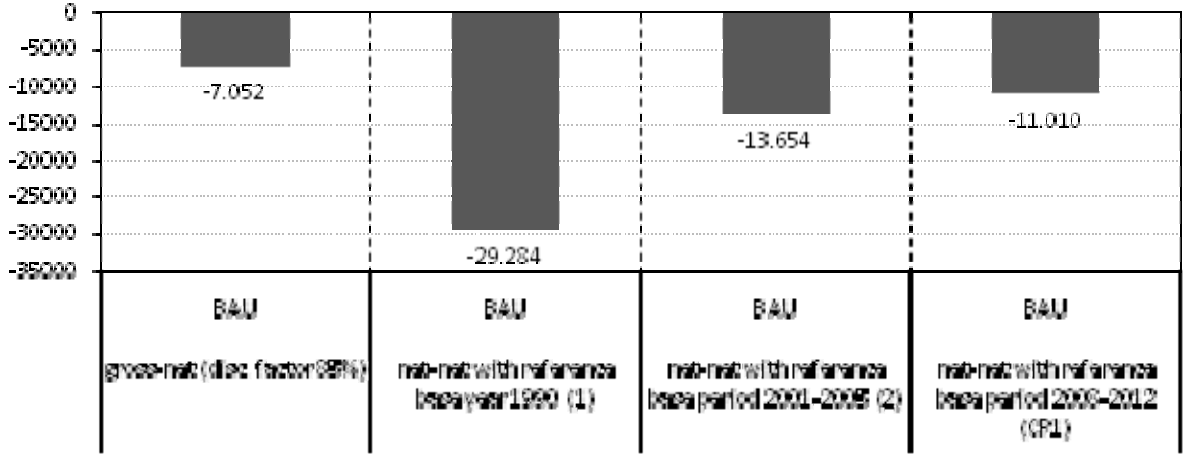
PROJECTION B

The long term trend of pool *Inflow* over the period of 1990 – 2008 (BAU: constant country specific average annual gradient of change of *Inflow* b (trend), based on average of last 5 years of *Inflow*, starting from 2009).

Annual HWP contribution according to accounting options (SCAD) [in Gg CO_2]



Annual HWP contribution according to accounting options (PA) [in Gg CO_2]



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