On April, 19th Italy submitted to the Secretariat the information on the forest management reference level for Italy inscribed in the appendix to annex I to decision 2/CMP.6, including an update to replace the value, in accordance with the guidelines outlined in part I of annex II to that decision.

We found out that there is a need of technical correction in the calculation matrix of the HWP model we have used for setting the reference level.

In particular the data was provided by the Johann Heinrich von Thünen-Institut (vTI, Germany) which has recently informed us that, in the course of the revision of the model, it was found out that the equation (1) (ref. pag.15 of the ITA individual submission) was not applied correctly to non-coniferous industrial roundwood (INDRW) due to a shifted cell in the calculation matrix. The underlying assumptions with respect to HWP and projected harvest rates provided by JRC models, however, remain the same, as well as the methodologies and assumptions used to set the overall reference level.

The resulting new data related to the contribution of HWP in the reference level of Italy now amounts to -984 $GgCO_2$, instead of -1 908 $GgCO_2$. Taking into account the new HWP value, the Italian reference level (ref. table 1 of the ITA submission) should be corrected as the following:

Proposed Reference Level [1], [4] ($GgCO_2$eq per year)	
(A) applying first order decay function for HWP [2]	**(B) assuming instantaneous oxidation of HWP [3]**
-15 315	-14 331

Please find attached to the present mail the revised section 5-(e) (pg.14 of the IT Submission) regarding the calculation of the HWP.

As UNFCCC Italian focal point, I kindly ask the Secretariat to forward the notation on the technical error to the reviewers for their consideration.
The new value will be inserted in the final resubmission together with the possible changes requested by the reviewers at the end of the review process.
Best regards,
Corrado Clini
(UNFCCC Italian focal point)

Harvested wood products - Italy

The contribution of HWP to the reference level of Italy amounts to -0,984 Mt CO2.

It was calculated using the C-HWP-Model, which estimates delayed emissions on the basis of the annual stock change of semi-finished wood products as outlined in the 2006 GL (Rüter, 2011). The estimation uses the product categories, half lives and methodologies as suggested in para 27, page 31 of FCCC/KP/AWG/2010/CRP.4/Rev.4.

The activity data (production and trade of sawnwood, wood based panels and paper and paperboard) is derived from the TIMBER database (UNECE 2011) (time series 1964-2009).

In order to achieve accurate results, the HWP numbers have been calculated applying the sub-categories of sawnwood, wood based panels and paper and paperboard as specified in Table 1. Sawnwood includes the Items 1632 and 1633, wood based panels comprising of Items 1634, 1640, 1646, 1647, 1648, 1649 and 1650, and paper and paperboard corresponds to Item 1876.

Following conversion factors have been used:

Table 1: Conversion factors of considered commodities*

Classification		Description of commodity	Air dry density	C conv. factor	Source
FAO	UNECE		[g/cm³]	[Gg C/1000m³]	
1866	1.2.C	Industrial roundwood, coniferous	0.450	2.250E-01	Kollmann (1982), (oak, beech)
1867	1.2.NC	Industrial roundwood, non-coniferous	0.670	3.350E-01	Kollmann (1982), (oak, beech)
1632	5.C	Sawnwood, coniferous	0.450	2.250E-01	Kollmann (1982), (oak, beech)
1633	5.NC	Sawnwood, non-coniferous	0.670	3.350E-01	Kollmann (1982), (oak, beech)
1634	6.1	Veneer sheets	0.590	2.950E-01	IPCC (2003)
1640	6.2	Plywood	0.480	2.402E-01	IPCC (2003)
1646	6.3	Particle board	0.630	2.898E-01	Hasch (2002), Barbu (2011)
1647	6.4.1	Hardboard	0.850	4.165E-01	Kollmann (1982), Barbu (2011)
1648	6.4.2	Medium density fibreboard	0.725	3.190E-01	Hasch (2002), Barbu (2011)
1649	6.4.x	Fibreboard, compressed	0.788	3.504E-01	(50 % hardboard / 50 % medium density fibreboard)
1650	6.4.3	Other board (Insulating board)	0.270	1.148E-01	Kollmann (1982), Barbu (2011)
1876	10	Paper and paperboard	0,900**	4,500E-01**	IPCC (2006)

* Items 1866 and 1867 are needed for methodological reasons only (see following section), ** in [g/g] and [Gg C/1000t]

In order to only estimate emissions from HWP removed from forests which are accounted for by Italy under Article 3, in a first step, the annual share of carbon in HWP coming from domestic forests has been calculated.
Following equations were used as industrial roundwood is assumed to serve as raw material for the production of HWP.

(1)

$$ratio_{INDRW\ consumption\ from\ dom\ harvest} = \frac{(Production_{INDRW} - Export_{INDRW})}{(Production_{INDRW} + Import_{INDRW} - Export_{INDRW})}$$

(2)

$$Production_{HWP\ from\ dom\ harvest} = Production_{HWP} * ratio_{INDRW\ consumption\ from\ domestic\ harvest}$$

The ratio (Equation 1) was calculated both for coniferous and non-coniferous industrial roundwood (*INDRW* , Items 1866 and 1867). For coniferous sawnwood and paper and paperboard, the ratio for coniferous industrial roundwood was applied. For non-coniferous sawnwood the ratio for non-coniferous industrial roundwood was applied. For the other HWP, the ratio of the annual mass weighted average of coniferous and non-coniferous industrial roundwood was applied.
As a result, this share of HWP produced from domestically harvested timber is presented as a percentage in Table 2.
The presented approach follows the initial assumption that all forests in Italy are managed, and in order to simplify matters, it is presumed that all harvest is allocated to forest management. This assumption is to be verified and corrected where necessary. The final allocation of carbon in HWP to forests which are accounted for under Article 3 shall be part of a technical correction as suggested in para 15 quater, page 27 of FCCC/KP/AWG/2010/CRP.4/Rev.4.

Table 2: Historic time series of amounts and share of accountable carbon Inflow to the HWP pool [in 1000t C and %]

1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
729	779	1172	1267	1402	1383	1522	1563	1528	1252	1153	1225	1260	1424	1476	1456	1617
58.1%	60.1%	58.8%	56.4%	55.6%	50.5%	54.1%	55.2%	49.4%	49.9%	35.9%	42.8%	36.3%	41.1%	42.1%	40.5%	42.6%

1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
1631	1618	1446	1421	1545	1576	1611	2071	1958	1665	1638	1384	1689	1668	2165	1962	2234
43.4%	47.1%	45.2%	40.7%	43.8%	46.7%	44.8%	47.1%	44.1%	37.2%	37.0%	32.0%	39.5%	36.4%	44.3%	40.4%	41.8%

1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
2207	2353	2076	2061	2044	2154	2206	2356	2543	2803	2730	2668
37.9%	39.8%	33.4%	33.6%	32.4%	34.3%	34.2%	35.8%	38.1%	41.9%	44.4%	49.8%

The annual carbon Inflow (= carbon in produced HWP) to the HWP pool prior to the year 1964 (first year for which activity data from TIMBER database (UNECE 2011) is available for Italy) has been calculated from the 5 years average from 1964 to 1968 and was assumed to be the constant carbon pool Inflow for the time period 1900-1963.

In order to provide a projection for the development of the HWP pool consistent with the assumptions on the future harvest, the rates of change of the Projected harvest (EC JRC, 2011) as compared to the last 5 years average of historic harvest, for which up-to-date data is available, was calculated (cf Table 3).

These projected growth rates as cp. to the average of the years 2003-2007 for Italy were applied to the same 5 years average of historic carbon Inflow to the HWP pool in order to receive the future Inflow to the HWP pool.

Table 3: Projection of carbon Inflow to the HWP pool

Average of historic harvest (2003-2007) [in 1000m3]	14,496										
Average HWP pool Inflow* (2003-2007) [in 1000t C]	2413										
years	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Projected harvest rate [in 1000m3]	16283.8	16641.2	16998.7	17356.2	17713.7	18071.1	18429	18786	19144	19501	19858.5
Change as cp to historic harvest (2003-2007) [in %]	12.33%	14.80%	17.26%	19.73%	22.19%	24.66%	27.13%	29.59%	32.06%	34.52%	36.99%
Projected carbon Inflow to HWP pool [in 1000t C]	2710.03	2769.52	2829.01	2888.5	2947.99	3007.49	3066.98	3126.47	3185.96	3245.46	3304.95

*a similar approach was chosen by Kangas and Baudin (2003): ECE/TIM/DP/30

For calculating the pool of HWP in use, three half-lifes for application in the first order decay function have been used as suggested by para 7, page 31 of FCCC/KP/AWG/2010/CRP.4/Rev.4.

- Sawnwood: 35 years
- Wood based panels: 25 years
- Paper and paperboard: 2 years

The projected net-emissions are calculated from the annual stock change estimates following the calculation method provided in IPCC 2006, Vol.4, Ch. 12 (Equation 12.1).

Table 4: Historic (up to 2009) and projected net-emissions from HWP pool [in 1000t CO2]

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
-536	-518	323	-814	-595	-2077	-1006	-1717	-1415	-1790	-657	-559	-450	-770	-843	-1205	-1593

2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
-2110	-1434	-1844	-826	-824	-838	-861	-891	-925	-962	-1000	-1040	-1079	-1119