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INFORMATION ON LULUCF ACTIONS IN BELGIUM

REPORT UNDER ARTICLE 10 OF DECISION 529/2013/EU

of the European parliament and the Council on accounting rules on greenhouse gas emissions and removals resulting from activities relating to land use, land-use change and forestry and on information concerning actions relating to those activities

MID-TERM REPORT - DECEMBER 2016

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1. Historical emissions and removals

1.1. Overview of the LULUCF sector

Forest land

Belgium has a temperate maritime climate, with moderate temperature variability, prevailing westerly winds, heavy cloud cover and regular rain.

Belgium adopted the following forest definition for use in accounting for its activities under the Convention, and Article 3.3 and 3.4 of the Kyoto Protocol:

Minimum tree crown cover: 20 %

Minimum land area: 0,5 ha

Minimum height at maturity: 5 m

These choices allow to use the result of the present and projected regional forest inventories (Wallonia and Flanders) to calculate the C stock of different pools (biomass, dead organic matter and mineral soil). This definition is fully consistent with the official FAO definition and is already reported in the 2010 Forest Resource Assessment.

The distribution of forests in Belgium is shown in table 1.1.

Geographic scope	Forest cover (%)	% of the total Belgian forest area
Wallonia	28,4%	75,4%
Flanders	13,1%	24,3%
Brussels Capital Region	12,3%	0,3%
Belgium	20,6%	100%

Table 1.1: Forest cover in Belgium (source: National Institute of Statistics and regional forest inventories)

Agricultural land

The land used for agriculture in 2014 covers 1 333 398 hectares (Table 5.1) or 47% of Belgium's surface. In 2014, the number of agricultural and horticultural businesses amounted to 37194. This number had dropped by 40% since 2000. The disappearing of small businesses being a general trend in the sector. Additionally in Flanders, this can be partly explained due to the subsidized cut down of the number of livestock. In 2001 and 2002 this was only the case for swine. In 2003 however an extension to bovine and poultry occurred. Nevertheless the land area used for agricultural purposes remained more or less the same during this period. In 2014 54% of the land used for agriculture was in Wallonia, while 65% of agricultural businesses were situated in Flanders. The land area used for farming is on average 25 ha per farm in the Flemish region and 55 ha per farm in the Walloon region.

Organic farming and the businesses in transition towards this type of farming only represent 5% of the total area in 2015 (of which 92% in Wallonia, 8 % in Flanders, see <http://www.bioforum.be>). The evolution of the Belgian agricultural sector is directly related to the Common Agricultural Policy of the European Union.

	1990	1995	2000	2005	2010	2011	2012	2013	2014
Number of businesses	86962	72660	61705	51540	42854	39528	38559	37761	37194
Usable agricultural area (ha)	1357366	1368135	1394083	1385582	1358019	1337303	1333913	1338566	1333398
Cropland	760559	851770	864076	842999	834388	824783	802772	816120	817117
Grains (ha) (with out maize)	327226	282427	277702	267975	276571	255654	274605	263955	270753
Wheat (ha)	205050	196828	204022	204209	209532	190875	206639	192047	197214
Sugarbeet (ha)	107837	98810	90858	85527	59303	62199	61165	60191	58602
Potatoes (ha)	49255	57417	65845	64952	81760	82341	66975	75315	80370
Maize (ha)	140066	183274	202120	218081	238844	245565	237688	251411	240947
Permanent Grassland (ha)	578626	495253	506946	519096	499687	488924	507237	498195	492042

Table 1.2: Main types of cultivation in Belgium in 1990-2014 (<http://statbel.fgov.be>)

	1990	1995	2000	2005	2010	2011	2012	2013	2014
Cattle	3248780	3286233	2993819	2664101	2627401	2572148	2504438	2510824	2515744
Dairy cattle	838697	684464	581462	494743	464448	456134	456394	444817	451990
Non-dairy cattle	2410083	2601769	2412358	2169358	2162953	2116014	2048044	2066007	2063754
Sheep	192133	157570	123943	118644	104705	98612	106372	107791	110966
Goats	8700	8872	13226	24021	30880	32688	34836	38959	41401
Horses	21141	23944	41440	43668	52579	51009	54234	59936	58161
Mules and asses	189	259	4878	6539	8778	8792	8921	8966	8645
Swine	6700422	7268492	6895306	6161195	6626631	6602009	6675233	6727928	6516338
Poultry (total)	27166776	33381390	36860444	32036898	32594108	32415965	33953944	36371586	37868067
other	23745	31293	76187	54884	64500	61189	63799	66091	72200

Table 1.3: Number of heads in the main livestock categories in Belgium in 1990-2012.
<http://statbel.fgov.be>

Climate

With an average temperature of 11.9°C in 2014 (<http://www.meteo.be/meteo/view/nl/18606670-2014.html>), Belgium as a whole has a “warm temperate moist” climate according to IPCC 2006 guidelines (Volume 4, Chapter 3, Annex 3.A5).

Land use change

Belgium follows the methodology described in the Good Practice Guidance for Land Use, Land-Use Change and Forestry (GPG LULUCF 2003) to establish the LULUCF inventory.

The LUC matrix has been determined by the Gembloux University (Gembloux Agro Bio Tech), a study conducted specifically for the LULUCF reporting in Belgium. The detailed methodology is described in the NIR (National Inventory Report, available here :

http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/8108.php).

The method adopted for monitoring of the land-use for Belgium is a grid of points (grid of reference) on which a diagnosis of occupation/land use is carried out for the various dates of reference. This method is in agreement with the coherent representation of the land use in the 2003 IPCC good Practice Guidance (<http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.html>). This method makes it possible to identify the activities of the size of the minimal surface of the forest chosen by Belgium (0,5 ha). It also makes it possible to avoid double counting and to facilitate obtaining the uncertainty of the estimates of surface. With each point of the grid of reference is allocated one of the 6 categories of land use proposed by the IPCC. A method of estimate of surface, by counting of points is then possible.

The diagnoses of occupation/land use are carried out following two types of information: vectorial cartographic layers or raster bearing on sets of themes related to the land use (example: Forest reference layer in Flanders, agricultural area data collected in the framework of the Common Agricultural Policy of the EU); layers images (orthophotoplans or images satellite with very high-resolution).

This study delivered a first estimate of the land-use change matrix during the 2010 submission at both the regional and national level. This first estimate was further refined in the next submissions. The matrix is now produced by the Regions

		1990						Total 2014	
		F	C	G	W	S	O		
2014	F	690.2	0.1	1.0	0.9	0.6	0.0	725.3	23.8%
	C	0.1	957.6	1.5	0.1	0.1	0.0	983.0	32.2%
	G	0.2	1.4	716.9	-0.1	0.0	0.0	642.1	21.0%
	W	-0.1	0.2	-0.1	29.0	0.0	0.0	48.5	1.6%
	S	0.0	-0.8	-1.1	0.0	558.9	0.0	653.9	21.4%
	O	24.0	24.0	24.0	24.0	0.0	0.0	0.0	0.0%
Total 1990	Area (kha)	714.5	982.5	742.3	53.9	559.6	0.0	3053	
		23.4%	32.2%	24.3%	1.8%	18.3%	0.0%		

Table 1.4: Land Use Change matrix in Belgium (1990 and 2014).

Soil organic carbon in soils

The soil organic carbon in Wallonia was recalculated by Latte *et al.* in 2011 in the framework of the study by Gembloux University. The mean carbon stock in forest soils (0-30 cm) is estimated at 111 t C/ha in 2000, compared to 96 t in a previous estimate from 2005. The 1960 figure has also been revised in Wallonia, following a comparable approach. The combination of these revisions of carbon stocks result in a lower annual flux of carbon removal in forest soil than in previous estimates. The SOC evolution between 1990 and 2000 is estimated at 0,61t C /ha.yr in Wallonia (Gembloux Agro Bio Tech) and 0,425 t C/ha.yr in Flanders, where the organic content in forest soils is generally lower than in Wallonia (Lettens et al., 2005).

The average carbon stocks in 2000 are given in table 1.5

Carbon stocks in soil (t C/ha)	Wallonia	Flanders
A. Forest Land	111	89,5
B. Cropland	44	52
C. Grassland	87	86
D. Wetland	100	100
E. Settlements	48	48
F. Other land	48	48

Table 1.5: Average carbon stocks in soils (t C/ha, 0-30 cm) in 2000.(NIR 2014)

In Wallonia, new data on carbon in agricultural soils (cropland, grassland) were made available in February 2015 and included in the 2016 submission under the UNFCCC. Also in Flanders data on carbon stocks in soils were reviewed (December 2014), validated results were integrated.

1.2. Trend assessment

As seen in Figure 1.1, in Belgium, forests are a major sink of carbon. This sink is rather stable over time and drives the overall trend of the LULUCF sector. The level of this sink is related with some methodological aspects in carbon stock change (see 6.2.1.1). Grasslands are also a sink while croplands become a sink from 2006 onwards¹.

The area of settlements increased steadily since 1990 (18% growth between 1990 and 2014). This is of course due to increased urbanization. This growth and the conversion from lands to settlements provoke emissions from carbon stock in soils. "Other lands" are not present anymore in the trend assessment as they were reclassified, in response to recommendations by the UNFCCC Expert Review Team.

¹ These numbers from the June 2016 submission were revised after the review in September 2016. Updated values, in which cropland remains a source, will be reported in 2017.

The result of these evolutions generates negative net emissions which remained fairly stable for LULUCF as whole in Belgium: approximately -2000 Gg eq. CO₂ between 1990 and 2000 and approximately -4000 Gg eq. CO₂ between 2006 and 2013 (-3854 Gg eq. CO₂ in 2014).

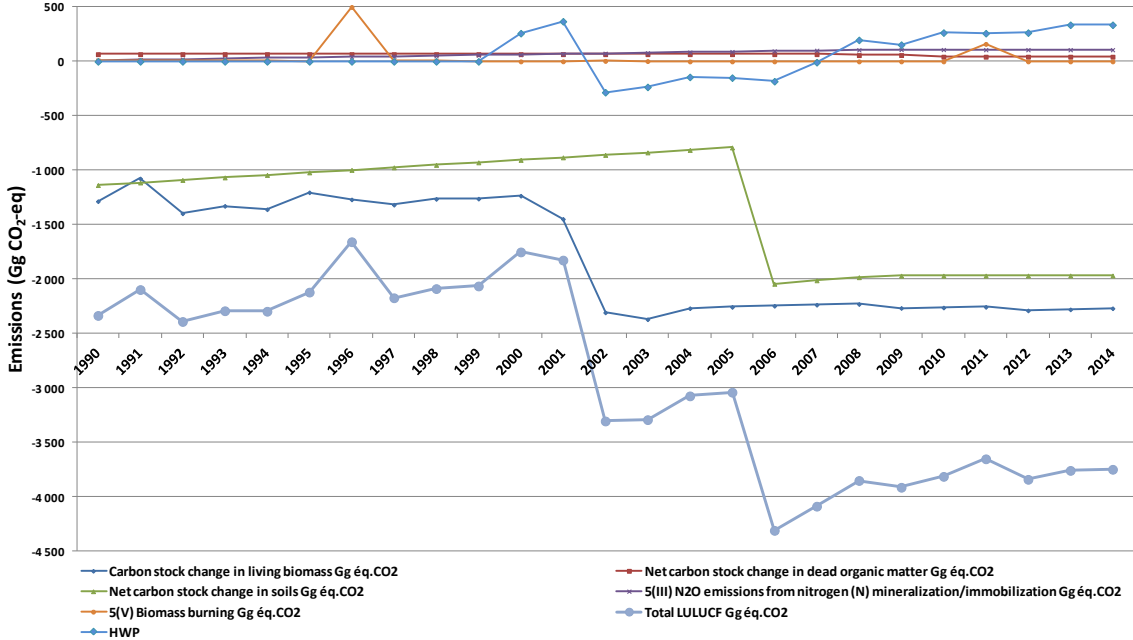


Figure 1.1: Emission and removal trends in LULUCF sector

Emissions of N₂O and CH₄ increase steadily from 2-3% in 1990 to about 11% of total sector sources mainly because of Direct N₂O Emissions from N Mineralization/Immobilization (except in 1996 with 34.5% and 2011 with 20.3% due to large forest fires).

If we look at the compartments rather than sub-sectors (see Figure 6.2), we find there is an accumulation of carbon in living biomass relatively stable and linked to the forest. As explained above, the level of this sink is related with some methodological aspects (see 6.2.1.1). Soil carbon is also a sink relatively stable which doubles from 2006 onwards because of new data for grasslands and croplands (see 6.3.2.1). Emissions from biomass burning '5(V)' have been significant only in 1996 (+500 Gg eq. CO₂) and 2011 (+161 Gg eq. CO₂).

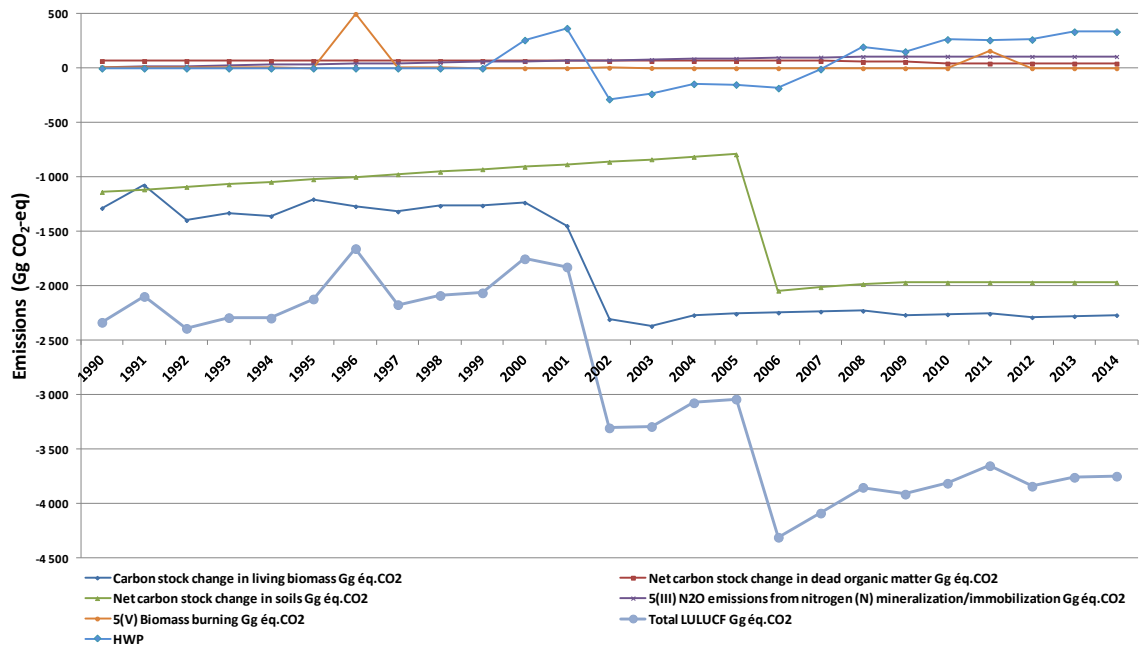


Figure 1.2: Emission and removal trends in LULUCF compartments

2. Projections for emissions and removals

2.1. Forest management reference level

Projections for Belgium are provided by the Joint Research Centre of the European Commission (JRC), based on elaboration of the results of independent EU modeling groups, coordinated by the International Institute for Applied Systems Analysis (IIASA), assisted by the JRC and funded by the European Commission Directorate General of Climate Action (DG CLIM). Belgium uses the JRC projections, as no Belgian model of the emissions and removals due to forest management was available nor could be developed within the time constraints.

When constructing the forest management reference level (FMRL), all elements mentioned in footnote 1 of paragraph 4 of the decision 2/CMP.6 on LULUCF were taken into account.

	2000	2005	2008	2010	2015	2020	Source of historical data (up to 2008)	Projected data (2010-2020)
G4M	664	653	648	645	640	636	(1)	(4)
EFISCEN	700	688	683	680	675	671	(2)	

Table 2.1: Area for FM as used by models (kha).

(1) G4M model: Gallaun, H., G. Zanchi, G. J. Nabuurs, G. Hengeveld, M. Schardt and P. J. Verkerk (2010). "EU-wide maps of growing stock and above-ground biomass in forests based on remote sensing and field measurements." *Forest Ecology and Management* 260(3): 252-261 (Based on CORINE and TBFRA). G4M is a spatially explicit forestry model and relies on the information from forest maps for its initialisation. This map served as a basis that was adjusted to the degree possible to data reported by countries (see points 2 and 3 below)

(2) Estimated by the JRC from UNFCCC reporting as: [area of "Forest land" in 1990 (assuming that "managed forest" under UNFCCC equals to land under FM)] - [area deforested since 1990 as included in KP reporting].

(4) Data of 2008 minus the area of Deforestation projected by G4M.

The EFISCEN data were taken from the 2010 inventory submission. This area has been slightly reviewed in the 2011 inventory submission, due to an increased sampling rate applied to prepare the Land-Use Matrix, but the difference is small (0,1% in 2000, 1,1% in 2005 and 1,3 % in 2008). A new run of the model it was performed by the time of the FMRL technical assessment in July 2011.

2.1.1. Modeled emissions and removals from forest management

		av. 2000-2008	2000	2005	2010	2015	2020	av. 2013-2020
Step 1: models' results (only biomass)	EFISCEN (1)	-1463	-1945	-1110	-1670	-1767	-1745	-1752
	G4M	-2912	-4221	-2358	-1858	-1312	-450	-1029
	Average of models	-2188	-3083	-1734	-1764	-1539	-1097	-1390
Step 2: ex-post processing	Offset (2)	biomass	554					
		non-biomass pools and GHG sources	-1570					
		total offset	-1016					
	Calibrated average of models (3)	-3204	-4099	-2750	-2780	-2556	-2113	-2407
Sensitivity analysis (4)	+10% harvest				-711	-2091	-1868	-2025
	-10% harvest				-3737	-3571	-3368	-3519

Table 2.2: Emissions and removals from FM as estimated by models (above and below-ground biomass, Gg CO₂ eq), calibration of models' results, and sensitivity analysis, as resubmitted by Belgium during the technical assessment of the reference level.

- (1) Efiscen does not estimate data for all countries for 2000 and 2005. When data were missing, backward extrapolation was applied as follows: sink in 2005 = sink in 2010 x ratio of harvest 2010/2005; this approach assumes that in the short term harvest is the main factor determining the sink. Estimates were extrapolated for the following countries: Bulgaria, Czech Republic, Estonia, Hungary, Italy, Latvia, Lithuania, and The Netherlands.
- (2) The "offset" is distinguished between:
 - biomass: calculated as difference between [average of country's emissions and removals from biomass for the period 2000-2008 (table 5)] and [average of models' estimated emissions and removals from biomass for the period 2000-2008 (table 8)]
 - non-biomass pools and GHG sources: calculated as the sum of non-biomass pools and GHG sources as reported by the country for the period 2000-2008 (table 5).
- (3) The calibrated average of models, used for the setting of reference level (see grey cell), is obtained by adding the offset to the average of models. See "ex-post processing of model's results" for details.
- (4) Simulation of the impact of +/-10% harvest as compared as BAU harvest on the emissions and removals from FM. Data are calibrated averages of models' results.

a) Forest characteristics and related management

1) Age class structure

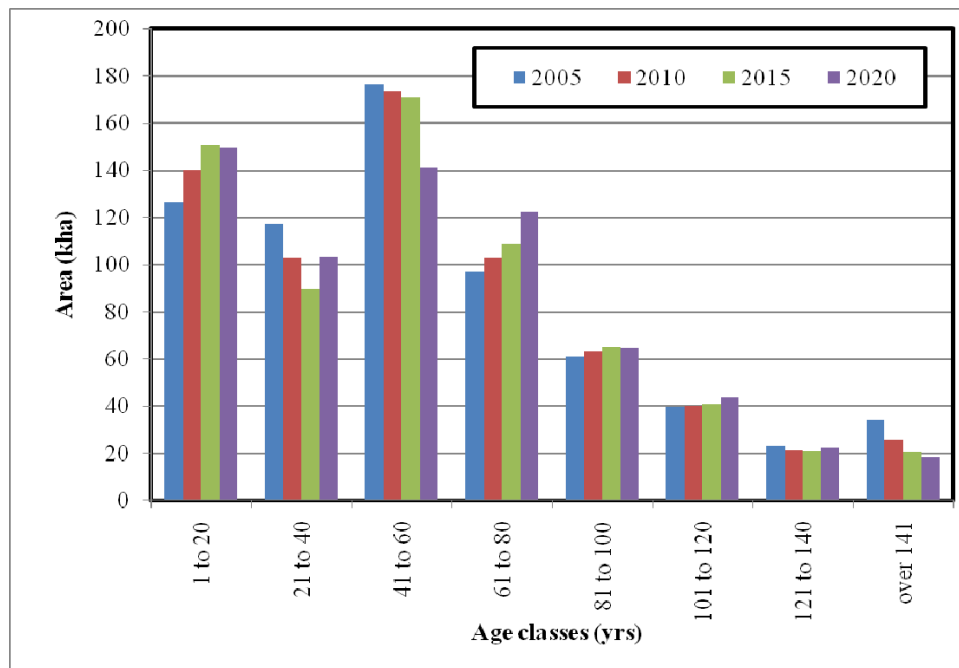


Figure 2.1: Evolution of the forest age class structure (in years) as modelled by EFISCEN.

2) Increment

	2000	2005	2010	2015	2020
G4M	8,9	8,6	8,3	8,2	8,1
EFISCEN	8,6	8,5	8,7	8,8	8,5

Table 2.3: Increments as estimated by models ($\text{m}^3 \text{ha}^{-1} \text{yr}^{-1}$)

3) Rotation length

	Min	Max
Quercus robur	100	220
Quercus rubra	140	180
Beech	140	200
Populus	15	40
Birch	65	100
Quercus spp.	120	220
Other broadleaved	80	180
Pine	60	120
Corsikan pine	60	120
Larch	40	100
Black pine	60	120
Spruce	50	100
Douglas Fir	50	90
Other conifers	50	110

Table 2.4: rotation lengths in years

b) Harvesting rates

1) Historical harvesting rates

Harvest (roundwood overbark, 1000 m ³)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Average 1998-2002	Average 2003-2007
Belgium	3.227	3.232	2.782	3.157	4.889	4.579	4.426	4.121	3.663	3.731	3.457	4.104

Table 2.5: Historical harvest rate (source: Belgian Forest Resources Assessment Report 2010)

The historical harvest rate used by models were those reported in the Belgian Forest Resources Assessment Report 2010 (<http://www.fao.org/docrep/013/al456f/al456f.pdf>)

2) Assumed future harvesting rates

2000	2005	2010	2015	2020	ratio (av. 2013-2020)/2005	Source of historical data (till 2007)
3.457	4.104	4.066	4.028	3.990	0,98	country data

Table 2.6: Historical harvest rate and projected BAU harvest demand used by models (roundwood overbark 1000 m³)

Notes: values in table 2.6 express 5-years averages (e.g. 2000 is the average 1998-2002, 2005 is the average 2003-2007). Till 2007, data are from national statistics, as reported by Belgium in the Forest Resources assessment report 2010. Data for 2020 were estimated by the models Primes (wood for bioenergy) and Globiom (timber). Data between 2008 and 2020 are interpolated. The harvest rate used by each model may slightly deviate from harvest demand (e.g. if the model did not “find” all the wood in the forests).

A general assumption has been done that all the harvest predicted till 2020 is allocated to FM, i.e. it was assumed that the harvest till 2020 on areas afforested/reforested or deforested after 1990 is negligible as compared to the harvest of forest areas which qualify as FM.

Final Reference level value

The final values of the FMRL and the Harvested Wood Products (HWP) pool include a correction to the values contained in the official submission on the FMRL submitted by Belgium, by which the HWP account, applying a first-order decay function, changed from $-0,066$ Mt CO₂ eq per year to $-0,092$ Mt CO₂ eq per year in accordance with an official communication sent by the Party.

Final FMRL values are $-2,499$ Mt CO₂ eq per year applying a first-order decay function and $-2,407$ Mt CO₂ eq per year assuming instantaneous oxidation of HWP.

The technical assessment report is available here :
<http://unfccc.int/resource/docs/2011/tar/bel01.pdf>

Technical correction in 2015

Considering the implementation of 2006 IPCC guidelines and KP²-Supplement and revisions of the estimates in the 2014 submission, linked to the availability of updated data from forest inventory, Belgium foresees to submit a technical correction of its reference level by the 2015 submission.

2.2. Cropland and grassland projections

The projected cropland and grassland areas were prepared in the context of the preparation of the new emissions ceilings under the NEC Directive³.

Activity	Unit	2005	2010	2015	2020	2025	2030
Arable land	1000 ha	892,193	870,132	894,259	867,224	883,780	867,962
Grassland	1000 ha	522,806	516,798	500,121	501,547	480,972	480,341

Table 2.7: Projected areas under the NEC Directive (GAINS/CAPRI data, 2014)

Regarding carbon stocks in cropland and grassland, no projections are currently available. In Wallonia and Flanders, the current data regarding carbon stocks and their evolution in cropland and grassland will be revised in 2015, following new data that should be available by February 2015 (new survey and harmonization of previous data sets regarding soil analysis issues).

2.3. LULUCF sector projections

Global projections for the LULUCF sector were prepared by IIASA for the EU Commission (afforestation/deforestation, forest management, cropland management and grassland management)

² KP= Kyoto Protocol

³ NEC = National Emission Ceilings , see <http://ec.europa.eu/environment/air/pollutants/ceilings.htm>

Baseline total LULUCF projection at country level :

G4M, EUFASOM	2005	2010	2015	2020	2025	2030
Belgium	-437	-210	496	984	850	915

Table 2.8: Baseline total LULUCF projection at country level as projected by G4M (AR, D, FM) and EUFASOM (CM and GM) in Gg CO₂.

G4M, EUFASOM	2010	2015	2020	2025	2030
Belgium	-321	-670	-777	-529	915

Table 2.9: Baseline total LULUCF projection at country level as projected by EFISCEN (AR, FM) G4M (D) and EUFASOM (CM and GM) in Gg CO₂.

Source :

http://www.iiasa.ac.at/web/home/research/researchPrograms/EcosystemsServicesandManagement/LULUCF_Final_Report_Sep21_2011_UNFCCC_review_update.pdf

Methodology :

<http://www.euclimit.eu/models/LULUCF%20methodology%20report.pdf>

3. Potential to limit or reduce emissions and to maintain or increase removals

The potential of the policies and measures described in chapter 5 is not estimated yet, although qualitative assessment and indicators are provided for some measures.

It should be noted that the Rural Development Programmes are still in the process of final approval, so some changes might be applied in the coming months. Regarding inventories, the application of ERT recommendations after the review in September 2016 will induce a recalculation of the estimates by 2017.

4. List of the most appropriate measures

Many policies and measures related to the LULUCF sector can contribute to reduce emissions and increase removals :

- Maintain or increase carbon stocks in forest through sustainable management, afforestation, changes in silvicultural practices, adaptation to climate change, protected areas, incentives for long-term use of wood in Harvested Wood Products
- Changes in agricultural practices to increase long-term carbon storage in soils or to reduce emissions from soils (reduced fertilisation and associated N₂O emissions)
- Replacement of fossil fuels and fossil-fuel based raw material by biomass from sustainable management

During the preparation of Flemish Climate Policy plan, sectoral stakeholder consultations have been organised. Several meetings were dedicated to agriculture (WG 1 Plants and soils, WG 2 Cattle and manure, WG 3 Energy, WG 4 General wrap-up of previous meetings, WG 5 Adaptation). Each meeting was organised as a working and discussion group. Numerous potential measures⁴ were discussed during the meetings and the conclusions of these discussions will be kept in mind in future policy development (whether general agricultural policy or climate-related policy aimed at increasing GHG sinks/reducing sources in the sector). Following these consultations, an awareness-raising brochure was produced and broadly distributed among the farmers.

The existing and planned policies and measures are described in chapter 5.

5. Existing and planned policies

5.1. Measures related to cropland management

In the agriculture sector, the bulk of the measures concerns cultivation practices and inputs rather than energy consumption and are consequently based on the existing policies with regard to the sustainable nutrient management programme, the agri-environment and climate measures (AECM)

⁴ Growing of multi-annual crops (fruit trees, short rotation woody crops, row or solitary trees, mixed grasses, lucerne growing, farm-scale composting, green cover sowing, conversion of cropland to grassland, energy crops,...)

and organic farming under Pillar 2 of the common agricultural policy (CAP) and the greening and cross-compliance under Pillar I of the CAP.

The Rural Development Plan in Wallonia has been approved in July 2015 and is presented here : http://agriculture.wallonie.be/apps/spip_wolwin/article.php3?id_article=473

The Rural Development Programme of Flanders has been approved in February 2015 and can be consulted here:

<http://lv.vlaanderen.be/nl/landbouwbeleid/plattelandsontwikkeling/publicaties>

Cross compliance in the Common Agricultural Policy

'Cross compliance' is an essential element of the common agricultural policy since its introduction in 2005. Indeed, the payments of direct support and support for agri-environmental and climate measures or for organic farming depend on compliance with a number of conditions. These conditions relate to environment, public health, animal health and welfare, plant health, conservation of permanent grassland and preservation of cropland in good agricultural and environmental conditions (GAEC).

Different aspects of the cross compliance have or can have an impact on GHG emissions and carbon sinks. Minimum requirements for soil erosion and soil organic matter levels, as well as the obligation for farmers to maintain permanent grassland are illustrative for these impacts. Inter alia, the management requirements arising from the European regulations and directives prohibit the modification of certain vegetation and landscape elements and provide requirements for the storage and for the low-emission application of manure.

First Pillar: The Green Direct Payment as an element of the direct payments

Since the reform of the agricultural policy in 2014, 30% of the direct payments is linked to compliance with 3 practices contributing to a better management of natural resources and to improved climate action. This is referred to as the Green Direct Payment. Greening is mandatory for any farmer applying for basic payments, although many exemptions do exist. The three practices mentioned before are: crop diversification, conservation of permanent grassland and providing ecological focus areas. All of these practices show some potential for carbon sequestration. For instance, different types of ecological focus areas (catch and cover crops, agroforestry, buffer strips, afforestation, small landscape elements) influence carbon sequestration and emissions.

Specific direct payments were provided by the Flemish government for the sowing of cover crops in some years of the previous period of the agricultural policy as well. The annual average area of cover crops obtained through these measures amounts to 80.000 ha in Flanders. In Wallonia, the recent « Arrêté du Gouvernement wallon du 13 juin 2014 fixant les exigences et les normes de la conditionnalité en matière agricole » imposes winter cover in soils subject to erosion risk.

Common Market Organisation (CMO) for fruits and vegetables: sowing green cover

Short description and objectives: Environmental actions have been included in the National Strategy for operational programs within CMO for fruits and vegetables. Producers organisations are required to include at least two environmental actions in their operational programs or to dedicate at least 10% of the funds of their operational programs to environmental actions.

One of the eligible actions in Flanders is the sowing of cover crops. The farmers applying for this support need to sow the cover crops (using certified seed) before 31st October and maintain them until at least 1st February. The measure aims at enhancing soil preservation (combat erosion and improve soil structure), increasing humus content and carbon sequestration, reducing nutrient leaching, environmentally friendly weed control, crop rotation, disease and pest protection and increasing agro-biodiversity.

In Flanders, the intermediate crop 2013/ 2014 green cover in the context of the CMO fruits and vegetables corresponds to an area of 1.528 ha.

Third Rural Development Programme (RDP III): agri-environment-climate measure: production of (crop/ grain) legumes

Short description: Farmers can obtain subsidies by growing (crop/grain) legumes for five consecutive years on their land. The list of authorised legumes is defined by Flemish regulations.

Objective: This measure contributes to GHG mitigation. Crop/grain legumes are able to fix nitrogen in a biological way, hereby reducing the need for fertilizers, which in turn lowers the emission of nitrous oxide (N₂O) in the atmosphere. The Flemish authorities also developed this measure with the aim to diversify roughage production in the Flemish livestock farming as well as to stimulate local protein production to reduce the livestock farmers' dependency from certain imported protein sources, such as soy. Worldwide, soy production induces important emissions of carbon to the atmosphere through land use changes such as deforestation and changes from grassland to cropland.

The measure is applicable to the entire Flemish territory.

Implementation: A similar measure existed in the second RDP. 17million euros (European + Flemish budget) were spent in the framework of this measure between 2007 and 2015. In 2014 the cultivated area within the scope of this measure amounted to approximately 4.260 ha in Flanders. In the total period of 2007-2014 this measure was applied on a total area of about 12.000 ha.

The third RDP aims at an area of 9.450 ha by 2020 in Flanders and 6.000 ha in Wallonia for this measure.

RDP III: agri-environment-climate measure: Cultivation of fibre flax and fibre hemp using reduced fertilization

Short description: The applicant can obtain a subsidy when cultivating fibre flax or fibre hemp during five consecutive years using reduced fertilization. To ensure that flax and hemp are effectively processed to fibres, and effectively sequester carbon, an additional processing contract or commitment is required.

Objective: The Flemish government uses this measure to reduce the use of nitrogen fertiliser and to improve the environmental sustainability as less N₂O is released into the atmosphere. These crops

induce long term carbon sequestration in sustainable materials (textile products, insulation material, surfacer, fibre board, composite materials,...). Up to 10 tonnes of CO₂-equivalents can be sequestered per hectare.

This measure also promotes more sustainable crops: flax and hemp. The use of plant protection products for these crops is traditionally very limited. Moreover, these crops need less nutrients and plant protection, which warranties limited environmental burden and preserved biodiversity.

This is new measure (it did not exist in the second RDP II). By the end of the period, the target area is 1.050 ha in Flanders.

RDP III: agri-environment-climate measure: Agreements for the conservation of small landscape elements

Short description: These agreements support the conservation of small landscape elements (hedges, tree rows, ...) through a conservation commitment of five years on a specific parcel.

Objective: The agreements result in carbon sequestration by aiming at the conservation and sound management of the small landscape elements. They also lead to the preservation of the rural landscapes and support local biodiversity.

Several sub-measures exist:

- Maintenance of hedges/coppice/shelterbelt/pollard trees following appropriate technical guidelines to enable their optimal development.
- Conversion management of shelterbelt. Apply appropriate technical guidelines to shelterbelts presenting invasive alien species and/or shelterbelts presenting arrears of maintenance to enable their renewed development.

These measures focus on areas in which their added value is the highest, the so-called management areas.

A similar measure existed in the previous period of the programme (RDP II). The agreements for the conservation of small landscape elements covered an area of 170 ha in 2014. In Flanders, 7,2 million euros (European + Flemish budget) were spent on these agreements in the period 2007-2014. In the whole period 2007-2014 300 ha was covered by this measure.

The target for the next period of the programme (RDP III) is to cover an area of 275 ha by 2020 in Flanders.

In Wallonia, the conservation of hedges is supported by the RDP and a large % of the hedges are already included in the programme, namely 13.360 km in 2012. The objective is to cover 70 % of the current hedges, namely 13.500 km by 2020 in Wallonia + 155 000 isolated trees.

RDP III: agri-environment-climate measure: Water quality agreements (Flanders)

Short description: The participants agree to farm low risk crops (low risk of nitrate leaching) on at least 90% of their cultivated area. This implies that a signatory will always grow a higher percentage of low-risk crops than the average of the farmers in the area. The agreement can be applied to

different plots every year. The farmer must comply with his minimal contractual area every year of the agreement.

Objective: Stimulating farmers to grow crops presenting low-risks of nitrate leaching, while considering erosion risk and organic matter supply for the crops at the same time, will reduce nitrogen and other pollutants leaching to surface and ground water. By introducing organic matter in the evaluation of the environmental performance of the crops carbon storage in soils is stimulated as well, along with soil structure and soil biodiversity. It is expected that leaching of fertile soils through water erosion will be mitigated as well.

This measure is implemented using management areas. As the measure aims to quickly improve water quality, it primarily targets areas where the water quality standards are not met.

This is a new measure of RDP III. The objective is to reach an area of about 11.600 ha in Flanders by the end of the programme period.

RDP III: agri-environment-climate measure: Agreements for reduced fertilizer use in and in the vicinity of Natura 2000-areas (cropland) (Flanders)

Short description and objective: Fertilizers cannot be applied in any form in nor in the vicinity of Natura 2000-areas to create appropriate abiotic conditions to realise the Natura 2000 objectives. The agreements are 5-year commitments to be applied for 5 years on specific plots.

This measure is only applicable to areas located in or in the vicinity of Natura2000-areas.

This is a new measure. The aim is to apply the measure on an area of 500 ha cropland in Flanders by the end of the programme period. RDP III: Advisory services for starting and established farmers

Short description and objective: Advisory services for specific themes can apply for financial support. These themes can be categorized under the following modules: module 1 farm business plan, module 2 business advice, module 3 cross compliance, module 4 greening, module 5 biodiversity, module 6 climate, module 7 water, module 8 soil, module 9 safety at work and module 10 transformation of agricultural products.

Modules 3, 4, 5, 6 and 8 can have a direct or indirect impact on (changes in) land use and consequently on the carbon content of the agricultural land.

A similar measure existed in the previous programme period (RDP II). In Flanders, a total of 12 million euros were spent and more than 7.000 farmers benefitted from advisory services through this measure in the period 2007-2013.

In Wallonia, individual agro-environmental action plans currently cover 1% of the farm businesses (15.000 ha). The objective for 2020 is to reach 200 businesses, corresponding to 20.000 ha.

RDP III: Organic farming

Short description: This measure consists of (per hectare) support for the conversion from conventional to organic farming on the one hand and for the continuation of organic farming practices on the other hand. To obtain per hectare conversion support, the farmer commits for a duration of at least two years (3 years if the legal term amounts to 3 years, which is the case for non-forage perennial crops) for every converted plot. In case of continuation support, the farmer can

obtain an annual premium when committing for a period of 5 years for every plot which already passed the legal conversion period.

Objective: The strategic plan for organic farming is a tool the Flemish government wants to use to stimulate organic production methods in several ways. One of the elements is the compensation of competitive disadvantage during and just after the transformation period. The measure contributes to the improvement of soil management and biodiversity in the cultivated area. Moreover organic farming leads to climate change mitigation by reducing the use of fossil fuels (for fertiliser and pesticides production, ...) and by increasing the organic carbon content of farmed soils.

A similar measure existed in RDP II. 6,7 million euros (European + Flemish budget) were spent on support for organic farming in the period 2007-2013 resulting in a covered area of about 4.000 ha in Flanders in 2014 and almost 10.000 ha for the whole programming period. About 7,8 million euros (European + Flemish budget) will be allocated in Flanders for this measure in the next programme period.

In Wallonia, organic farming is also supported by the authorities, including through financial incentives (arrêté du Gouvernement wallon du 06/11/03). The total area under organic farming increased from 580 ha in 1987 to 55.000 ha in 2012. The objective of the Walloon RDP towards 2020 is to have 14% of the agricultural area under organic farming.

(http://agriculture.wallonie.be/JV/PO_FEADER.pdf)

RDP III: non-productive investments

Short description and objective: This measure provides financial support for farmers doing investments targeted at soil or water management or at increased biodiversity or landscape value, without having economical benefits himself. The following types of investment form a part of a limitative list of eligible measures:

- The creation of small landscape elements, such as hedges, shelterbelts, tree rows with indigenous seedlings;
- The creation of pools
- The restoration of plantation along hollow roads and slow roads,
- Erosion dams
- Small scale water infrastructure (e.g. dikes, ...)

This measure is new, as in the previous programming period, non-productive investments could be included in the agri-environment schemes.

The measure contributes to the realisation of objectives regarding environment, biodiversity, erosion prevention, water management, visual integration of agricultural buildings in the landscape etc. Additionally, the measure also mitigates ammonia emissions and increases carbon sequestration.

RDP III in Flanders foresees approximately 3,6 million euros (European + Flemish budget) for this measure for an expected total of about 2.875 projects.

Several agri-environment measures were applied in Wallonia during the previous RDP (2007-2013), such as the 'low stocking rate' measure, which had a direct impact on the organic nitrogen inputs, indirectly reflected in the inventories via the reduction in livestock, or the measures to reduce inputs in cereals, which also contribute to reducing inputs of mineral nitrogen.

5.2. Measures related to grazing land management and pasture improvement

Cross compliance in the Common Agricultural Policy

Cross compliance is an essential element of the common agricultural policy since its introduction in 2005. Indeed, the payment of direct support and support for agri-environmental-climate measures and for organic farming depend on compliance with a number of conditions. These conditions relate to environment, public health, animal health and welfare, plant health, conservation of permanent grassland and preservation of cropland in good agricultural and environmental conditions (GAEC).

Different aspects of cross compliance have or can have an impact on GHG emissions and carbon sinks. Minimum requirements for soil erosion and soil organic matter levels, as well as the obligation for farmers to maintain permanent grassland are illustrative for these impacts. Inter alia, the management requirements arising from the European regulations and directives prohibit the modification of vegetation and landscape elements and provide requirements for the storage and for the low-emission application of manure.

First Pillar: The Green Direct Payment as an element of the direct payments

Since the reform of the agricultural policy in 2014, 30% of the direct payments is linked to compliance with 3 practices contributing to a better management of natural resources and to improved climate action. This is referred to as the "Green Direct Payment". Greening is mandatory for any farmer applying for basic payments. The three practices mentioned before are: crop diversification, conservation of permanent grassland and supplying ecological focus area. All of these practices show some potential for carbon sequestration. For instance, different types of ecological focus area (catch/cover crops, agroforestry, buffer strips, afforestation, small landscape elements) influence carbon sequestration and emissions.

RDP III: agri-environment-climate measure: Agreements on grassland or grass strips

Short description: These agreements involve commitments of five years on a specific parcel.

Objective: These agreements aim to stimulate the development of multifunctional grasslands or strips of land to combat erosion (soil management), protect water bodies or fragile small landscape elements, provide pollen/nectar producing crops and/or create an appropriate biotope for the fauna and flora related to the agricultural ecosystem. These measures also increase carbon sequestration.

In Flanders, several sub-measures within the agri-environment-climate scheme focus on grassland or grass strips the most relevant ones for LULUCF action are listed below:

- Develop and/or maintain species-rich grassland by excluding the use of fertilizers, soil improvers and pesticides and by adapting the mowing and grazing regime according to the advice of an expert.
- Develop and/or maintain an erosion strip: reducing soil washout on erosion prone plots by developing or maintaining a grass strip.
- Develop and/or maintain strategic grassland: reducing erosion at the source by creating and/or maintaining grassland on strategic locations.
- Develop and/or maintain a buffer strip: Protect fragile landscape elements by creating and/or maintaining a grass strip on which use of fertilizers, soil improvers and pesticides is prohibited. The mowing season of these strips is also postponed to 15th June.
- Develop and/or maintain fauna strips: Offer appropriate habitats to animal species related to specific landscapes by creating or maintaining herb-rich grass strips, adapting mowing practices and provide herb rich edges to allow a more structured vegetation in the winter period.
- Creation and maintenance of a flower strip: Provide pollinators with sufficient food supplies through the creation of a flower strip.

These measures focus on areas in which their added value is the highest, the so-called management areas.

For this measure as a whole, the RDP III aims at a total covered area of 8.119 ha in Flanders by 2020.

Similar measures existed in the previous programme period (RDP II). During the whole programming period 2007-2013 The agreement on plot edges management covered 2.568 ha , the agreement on species protection covered 2.164 ha and the agreement on erosion prevention 7.255 ha. The total budget in RDP II spent on plot edge management amounts to 13,8 million euros, on species protection 4,7 million euros and on erosion prevention almost 8 million euros (European + Flemish budget).

In Wallonia, measures such as ‘grass strips’ and ‘extensive field strips’ also exist and currently cover respectively 2.942 km and 1.200 km (1.800 ha). The aim is to apply the measure in Wallonia on an area of 2.650 ha cropland under “Tournière enherbée”(Grass strip), 1.000 ha under “Parcelle aménagée” and 3.250 ha under “Bande aménagée” by the end of the programme period.

RDP III: agri-environment-climate measure: Agreements for reduced fertilizer use in and in the vicinity of Natura 2000-areas (grassland)

Short description and objective: In Flanders, fertilizers cannot be applied in any form in nor in the vicinity of Natura 2000-areas to create appropriate abiotic conditions to realise the Natura 2000 objectives. The agreements are 5-year commitments to be applied for 5 years on specific plots.

This measure is only applicable to areas located in or in the vicinity of Natura2000-areas.

This is a new measure. The aim is to apply the measure on an area of 500 ha grassland in Flanders by the end of the programme period.

In Wallonia, similar support is proposed by the new RDP: for grasslands under Natura 2000 with “strong constraints”, including reduced use of fertiliser, an annual area of 6.035 ha is foreseen for the period 2014-2020.

RDP III: Advisory services for starting and established farmers (Flanders)

Short description and objective: Advisory services for specific themes can apply for financial support. These themes can be categorized under the following modules: module 1 farm business plan, module 2 business advice, module 3 cross compliance, module 4 greening, module 5 biodiversity, module 6 climate, module 7 water, module 8 soil, module 9 safety at work and module 10 transformation of agricultural products.

Modules 3, 4, 5, 6 and 8 can have a direct or indirect impact on (changes in) land use and consequently on the carbon content of the agricultural land.

A similar measure existed in the previous programme period (RDP II). In Flanders, a total of 12 million euros were spent and more than 7.000 farmers benefitted from advisory services through this measure in the period 2007-2013.

RDP III: Organic farming

Short description: In Flanders, this measure consists of (per hectare) support for the conversion from conventional to organic farming on the one hand and for the continuation of organic farming practices on the other hand. To obtain per hectare conversion support, the farmer commits for a duration of at least two years (3 years if the legal term amounts to 3 years, which is the case for non-forage perennial crops) for every plot he/she converts. In case of continuation support, the farmer can obtain an annual premium when committing for a period of 5 years for every plot which already passed the legal conversion period.

Objective: The strategic plan for organic farming is a tool the Flemish government wants to use to stimulate organic production methods in several ways. One of the elements is the compensation of competitive disadvantage during and just after the transformation period. The measure contributes to the improvement of soil management and biodiversity in the cultivated area. Moreover organic farming leads to climate change mitigation by reducing the use of fossil fuels (for fertiliser and pesticides production, ...) and by increasing the organic carbon content of farmed soils.

In Flanders, a similar measure existed in RDP II and 6,7 million euros (European + Flemish budget) were spent on support for organic farming in the period 2007-2013 resulting in a covered area of about 4.000 ha.

About 7,8 million euros (European + Flemish budget) will be allocated to this measure in the next programme period in Flanders.

In Wallonia, organic farming is also supported, including through financial incentives (arrêté du Gouvernement wallon du 06/11/03). The total area under organic farming increased from 580 ha in 1987 to 55.000 ha in 2012. The objective of the Walloon RDP towards 2020 is to have 14% of the agricultural area under organic farming. (http://agriculture.wallonie.be/JV/PO_FEADER.pdf)

5.3. Measures to prevent drainage and to incentivize rewetting of wetlands.

In Wallonia, the Forest Code (Decree of 15 July 2008) has introduced a certain number of constraints in favor of forest conservation and the maintenance of ligneous materials and carbon, including the limitation on drainage (which encourages maintenance of organic matter).

Many wetlands were protected through the establishment of a network of protected areas (Natura 2000) by the three Regions, and at Federal level for the marine environment. 234 special protection areas have been designated for the purposes of the Birds Directive and 280 special conservation areas for the purposes of the Habitats Directive, making a total of 458 Natura 2000 sites and corresponding to a total surface area of 5.136 km² (http://ec.europa.eu/environment/nature/natura2000/barometer/index_en.htm – 2011)

5.4. Measures related to forestry activities

In Wallonia, the Forest Code (Decree of 15 July 2008) has introduced a certain number of constraints in favour of forest conservation and the maintenance of ligneous materials and carbon, including:

- the abolition of inheritance duties on the stumpage value, which encourages more ecological forestry choices (maintaining the material, greater possibility to choose species with a long life cycle and to apply continuous cover, etc.);
- the restriction of clear-cutting;
- the obligation to plant species suited to the site, which contributes to limiting the risks of blowdown and dieback and improves resistance to climate change;
- the creation of integral reserves;
- the limitation on drainage (which encourages maintenance of organic matter);
- incentives for production of high quality wood and therefore use of wood in long-term applications with gains in CO₂ linked to substitution by other materials.
- thinning standard in even-sized spruce stands of 2009. This new standard is part of more dynamic forestry than that practised in many places. The aim behind the desire for renewed dynamism in forestry regarding the main coniferous species existing in Wallonia is mainly to produce timber in stable, healthy stands, with higher biodiversity and a shorter life-cycle. In the context of global warming, these advantages linked to the dynamism of the clearings can only be beneficial to production, by limiting the disadvantages suffered from pronounced droughts or more numerous beetle populations, for example.⁵ In addition, increasing the dynamism of forestry of both coniferous and deciduous trees contributes to increasing the proportion of wood in long-term uses and therefore storage in wood products.

The designation of 1.500 km² of forests in Natura 2000 under special fixed rules of management also contributes to these various objectives.

⁵de Potter B., 2011. Prise en compte des changements globaux pour la gestion des pessières en Wallonie [Taking into account global changes in the management of spruce in Wallonia]. Forêt Wallonne 114: 17-25

In the Brussels Capital Region, the Forêt de Soignes/Zoniënwoud is protected (no deforestation allowed). Its management is FSC certified and aims to ensure ecological stability and a long-term balance in the distribution of forest age. In addition to ensuring the ability to regenerate, biodiversity and ecological and social aspects are taken into account. A whole web-platform is dedicated to the Forêt de Soignes : <http://www.sonianforest.be/>.

The Flemish Region has an active forest expansion policy. The Flemish authorities have drawn up a strict regulation for optimum conservation and protection of the Flemish forest (Forest Decree of 13 June 1990 and Decree of 18 May 1999 concerning the organization of spatial planning and Decision of the Flemish Government on 16 February 2001 to clarify the rules concerning compensation and deforestation and exemption from the ban on deforestation). As a general rule, deforestation is prohibited. There are a number of exceptions, but a permit is required in each case and this permit will be granted only in exchange for compensation. The obligation for compensation consists of the planting of a forest of equal size or larger at another location.

The compensation can also be financial in the form of a forest maintenance contribution to the Forests Compensation Fund. In addition, the Flemish authorities have created instruments to ensure the biodiversity and sustainable use of natural resources. In various cases, planting of forests is subject to acquiring a nature permit in the case of protected (open) vegetation (Decree of 21 October 1997 concerning nature conservation and the natural environment; Decision of the Flemish Government of 23 July 1998 establishing the rules for the implementation of the Nature Conservation Decree) or the planting of forests in agricultural areas (Rural Code of 7 October 1886).

Reforestation (Wallonia)

A new measure was adopted in Wallonia in September 2016⁶ : a subsidy for plantation after harvest is granted to small private forest owners (area less than 5ha), for areas between 0,4 and 3 ha. This was decided after noticing that those small properties are often left without plantation. The system was originally applied in the Luxembourg province of Wallonia, but will be extended to the whole region.

RDP III: Afforestation (Flanders)

Short description: This measure includes a plant subsidy, a maintenance subsidy and a compensation for income losses. A subsidy is provided for afforestation using indigenous species or poplars with an indigenous understorey. Compensations for wildlife protection (construction of game fences or individual shelters) are also provided. In the case of replantation, the use of seedlings from recommended species is compensated as well. For 12 years after the conversion farmers receive a

subsidy as a compensation for their income losses due to the conversion of agricultural land into forest land as well as a subsidy for the maintenance of forest land.

Objective: This measure is aimed at the expansion of the forest area considering the realisation of the conservation targets for Natura 2000. The purpose is to minimize the impact of the Natura 2000 conservation targets on the agricultural sector. Every forest expansion realised through this measure lowers the need to directly involve farmers to reach the Natura 2000 conservation targets. Moreover stimulating these good forestry practices (including wood production) has beneficial effects on carbon sequestration.

The RDP III aims at an area of 1.400 ha and 7,6 million euros (European + Flemish budget) will be provided for current and future contracts.

The RDP I and II allocated about 2 million euros to a similar measure, which resulted in the conversion of 281 ha of agricultural land into forest land in the period 2007-2013.

RDP III: Development of an Agroforestry system

Short description: In Flanders, this measure offers the possibility for a lasting coexistence and reinforcement of agriculture (cropland or grassland) and forestry in the long-term. The farmer can obtain a subsidy for the creation of an agroforestry system if this system is maintained for at least 10 years.

Objective: The sequestration of carbon is increased and the emission of CO₂ is reduced through the creation of the tree rows. Firstly, carbon is sequestered in the woody mass and in the soils through the development of extensive roots, falling leaves and the absence of tillage of the tree row. Secondly, the N₂O emissions are lowered through reduced tillage. Apart from reducing erosion risk, the deep roots of the tree rows improve the soil structure and water management system, which is beneficial from both agricultural and environmental points of view.

In Flanders, this measure was initiated during the RDP II as from 2012. In this period about 75.000 euros (European + Flemish budget) were spent on 17 requests covering an area of 38 ha.

The measure is extended in RDP III and a target area of 150 ha of agroforestry has been set, which should be reached thanks to a 500.000 euros budget.

In Wallonia, the measure is included in the new RDP, which plans to cover 3000 ha by 2020.

RDP III: Reforestation (Flanders)

Short description: Subsidies are granted to reforestation projects of at least 0,5 ha. These projects are performed through the replantation of several indigenous and geographically adapted species or by rejuvenation projects using indigenous species (non-exclusive). Compensations for wildlife protection (construction of game fences or individual shelters) are also provided. In the case of replantation, the use of seedlings from recommended species is compensated as well.

Objective: The measure aims to ecologically improve existing forests and forest structures. It also aims to increase the share of indigenous species. These reforestations using indigenous species contribute to the realization of the preservation targets for Natura2000 areas. Moreover stimulating these good forestry practices (including wood production) has beneficial effects on carbon sequestration.

A target area of 1.900 ha has been defined and a budget of about 5,5 million euros (European + Flemish budget) will be allocated to support these projects.

A similar measure was provided in the previous programme RDP II where 3,8 million euros (European + Flemish budget) were paid to 950 forest managers.

The Flemish authorities have developed various instruments to ensure biodiversity and sustainable use of natural resources (protection of vegetation and landscapes). Group certification under the FSC system has existed in Flanders since 2008, which is open to all forest owners who have a detailed forest management plan according to the criteria set by the Flemish Government for sustainable forest management.

5.5. Preventing deforestation.

In Wallonia, Article 38 of the Forest Code limits the logging to 5 ha in coniferous stands and to 3 ha in deciduous stands.

5.6. Strengthening protection against natural disturbances such as fire, pests, and storms.

5.6.1. Fires

Both in Wallonia and Flanders, post-logging burning of harvest residues is banned by the Forest code see <http://wallex.wallonie.be/index.php?doc=11597>, and

http://www.natuurenbos.be/nl-BE/Natuurbeleid/Bos/Wetgeving_en_vergunning/Bosdecreet.aspx.

Areas affected by wildfires in Belgium are extremely variable from one year to another. On average, the occurrence of fires is very low, given the usually wet and cool Belgian climate. Fires do not occur every year.

Between August 1995 and July 1996, only 476.1 mm of rainfall were recorded in Uccle (reference national station of IRM), compared to a usual average of 800 mm/year. This explains the forest fires that have occurred in April 1996 on 863 ha. In 2011, dry conditions also led to fires in the Fagnes, covering 35 ha of forest and 1265 ha of grassland in this area of natural reserve (Walloon region) and 678 ha (mainly grassland) in Kalmthout and Meeuwen-Gruitrode (Flemish region).

5.6.2. Pests

In Wallonia, the Walloon Forest Health Observatory (OWSF), inaugurated in April 2011, is a powerful tool for the evaluation and phytosanitary monitoring of the Walloon forests in the short and long term. In the specific context of global warming and conserving biodiversity, the OWSF intervenes by proposing rapid solutions in the case of health problems, disasters, proliferation of parasites or pathogens or any other problem likely to affect the Walloon forests. Health monitoring is the basic principle of phytosanitary forest observation since it enables a problem to be registered as soon as it is observed. Forest health is obviously considered throughout the territory and covers both public and private forests. Link to the first newsletter of the OWSF: http://www.srfb.be/sites/default/files/la%20Lettre%202012-13_OSWF_SPW_Demna.pdf

5.6.3. Storms, droughts and heat waves

The new Forest Code⁷ in Wallonia (approved on 15 July 2008 by the Walloon Parliament) advocates a mixed-species, mixed-age forest, adapted to climate change and able to mitigate certain effects. Forestry practices must therefore try to favour the species best adapted to (present-day) local conditions, which constitutes a first step towards adaptation to future changes.

Species diversification and conservation of ecosystems that have remained relatively unaltered by human activity also enhance the forests' capacity to adapt to changes [6]. Among the measures outlined within the new Forest Code are the retention of dead or fallen trees, the retention of at least one tree of biological interest per 2-hectare area and the introduction of integrated forest reserves in broad-leaved stands. Moreover, in order to improve the resilience of the forest ecosystem, we should encourage complex forest structures, ensure that soil fertility is maintained, manage water resources optimally (enhance soil and groundwater recharge by maintaining good soil structure and limiting the water consumption of the ecosystem through our choice of species and forestry practices), monitoring the density of game populations and correcting imbalances by means of amendments to situations requiring a response. Such provisions also apply in the Brussels-Capital Region.

In the Walloon region, a group of experts is studying the impacts of climate change in forest ecosystems. This group has produced a document containing recommendations for policy makers and a good practice guide for forest managers. As stated above, the spruce a tree widespread in Wallonia is highly vulnerable according to the climatic projections. Consequently, a new norm has been approved in 2009 to adapt the forestry practices of this species related to global changes (including climate change).

⁷ Decree of 15 July 2008 relating to the Forest Code (Belgian Official Journal of 12.09.2008), amended by a Walloon Government Decree of 12 December 2008 relating to the date of effect of Article 6 of the Decree of 15 July 2008 concerning the Forest Code and the operations of the Conseil Supérieur Wallon des Forêts et de la Filière Bois (Walloon Higher Council for Forestry and Timber Industry) (Belgian Official Journal of. 13.01.2009), [23]

The Walloon “Ecological file of species” and “Afforestation Guide” are the two main tools available for the forest manager to ensure the selection of appropriate tree species, depending on site characteristics and climate conditions, with a view to increase their resilience. These guidebooks are currently being revised and a new division of the territory was performed on the basis of updated climatic data and the current state of the art regarding species autoecology⁸.

In the Brussels-Capital Region, the Forêt de Soignes/Zoniënwoud is particularly vulnerable to climate change, considering that its main varieties (beech tree and summer oak) are particularly sensitive to droughts. The prospects for their preservation are not optimistic. The forest is a particularly interesting case due to its proximity to a large city that generates specific disturbances (intensity of atmospheric pollution, density of human visitors, etc.). The evolution of its beech trees and oaks is monitored thanks to a permanent inventory of their condition. The first inventory revealed signs that the forest was dying. The Region has adopted a forest management plan in 2003 to preserve or improve its regenerative capacity and adaptation to environmental change. In the framework of the new management plan, adaptation to climate change will be integrated. This objective is to maintain or improve the regeneration capacity and the adaptation of the forest heritage to the climate change⁹.

5.6.4. Forest certification

Measures are being taken to preserve the ecological stability of the forests by reinforcing the concept of sustainable management of the forests in forestry practices. This may take the form, for example, of promotion of systems of forest certification.

On 18 November 2005, the Federal Government concluded an agreement relating to a circular on sustainable wood (also see OB-A01). This circular required that as of March 2006 under their procurement policy, the federal authorities may only buy certified wood coming from forests under sustainable management. For this purpose, the circular sets criteria which must be satisfied under the wood certification systems. A number of actions have been taken by the Federal Government to prevent importing and marketing of wood felled illegally and to strengthen the controls and penalties imposed on this trade.

The Walloon Region is committed to PEFC certification of sustainable forest management. Certification is a tool to permanently improve management at the regional level and the practices on the ground. It makes it possible for the diverse interested actors to meet and form a consensus on forest management: owners, industrialists, scientists, environmentalists and users. Certification also makes it possible to provide a guarantee to the consumer that use of the wood goes hand in hand with good management of the forest. At present (situation January 2014), about 54% of the Walloon forest area are PEFC certified (more than 90% of the publicly-owned forests managed by the Department of Nature and Forests are PEFC certified).

⁸ <https://www.foretwallonne.be/images/stories/pdffolder/FO135-47-58.pdf>

⁹ See action 123 of the Air-Climat-Energy Plan of the Brussels-Capital Region

In the Brussels Capital Region, the management of the Forêt de Soignes/Zoniënwood is FSC certified and aims to ensure ecological stability. In addition to ensuring the ability to regenerate, biodiversity and ecological and social aspects are taken into account.

The Flemish authorities have developed various instruments to ensure biodiversity and sustainable use of natural resources (protection of vegetation and landscapes). Group certification under the FSC system has existed in Flanders since 2008, which is open to all forest owners who have a detailed forest management plan according to the criteria set by the Flemish Government for sustainable forest management.

5.7. Measures to substitute greenhouse gas intensive energy feedstocks and materials with harvested wood products.

In the Walloon Region, there has been a Wood-Energy Plan since 2001. It aims at setting up about ten projects for automatic heating systems using wood, gas generators or other technologies modified to make use of the energy value of wood on the Walloon territory. This plan affects essentially municipalities and local governments.

By June 2012, the Plan had supported 45 installations for a total power of 11,3 MW and 7,6 km of heating network. It plans to support 44 additional projects for a total power of 9 MW and more than 10 km of network.

6. Indicative timetables

The measures related to the Rural Development Plan and Common Agricultural Policy should be implemented during the period 2014-2020. In Wallonia, the Rural development Plan has been officially approved in July 2015 and launched in September 2015. In Flanders the Rural Development Programme was officially approved in February 2015; some measures were implemented very shortly after that, other measures started later in 2015 or 2016.