

3. The ‘with measures’ greenhouse gas emission projections

[this paragraph 3 includes small corrigenda (marked in red) to paragraph 3 as mentioned in the report notified to EC on 15-May-09]

The following tables report the 2006 Belgian greenhouse gas emissions and the compiled 2009 ‘with measures’ projections for the years 2010 (mean for period 2008-2012), 2015 and 2020.

Reference year 2006 (inventory 2009)

CRF format (kton CO ₂ -eq)	CO ₂	CH ₄	N ₂ O	F	SUM
1 Energy	109 030	729	1 143	0	110 902
1A Fuel combustion	108 898	310	1 143	0	110 351
1A1 Energy industries	27 657	14	151	0	27 822
1A2 Manufacturing industries and construction	27 438	65	46	0	27 550
1A3 Transport	25 193	58	811	0	26 062
1A4 Commercial / residential / agriculture	28 481	172	133	0	28 787
1A5 Other	129	0	1	0	130
1B Fugitive emissions from fuels	132	419	0	0	551
2 Industrial processes	9 977	57	2 565	1 828	14 427
3 Solvent and other Product Use	0	0	247	0	247
4 Agriculture	0	5 133	4 707	0	9 840
5 Land-Use Change and Forestry	0	0	0	0	0
6 Wastes	78	850	272	0	1 200
7 Other	0	0	0	0	0
Total	119 085	6 769	8 934	1 828	136 616

Year 2010 (mean for period 2008 – 2012)

CRF format (kton CO ₂ -eq)	CO ₂	CH ₄	N ₂ O	F	SUM
1 Energy	108 389	628	1 266	0	110 283
1A Fuel combustion	108 243	244	1 266	0	109 753
1A1 Energy industries (including CHP)	27 330	15	188	0	27 533
1A2 Manufacturing industries and construction (without CHP)	25 012	57	81	0	25 151
1A3 Transport	24 901	24	840	0	25 765
1A4 Commercial / residential / agriculture	30 898	148	157	0	31 202
1A5 Other	102	0	0	0	102
1B Fugitive emissions from fuels	146	384	0	0	530
2 Industrial processes	10 975	58	3 032	2 173	16 238
3 Solvent and other Product Use	0	0	219	0	219
4 Agriculture	0	4 909	4 333	0	9 241
5 Land-Use Change and Forestry	0	0	0	0	0
6 Wastes	85	582	277	0	943
7 Other	0	0	0	0	0
Total	119 448	6 177	9 126	2 173	136 924

Year 2015

CRF format (kton CO ₂ -eq)	CO ₂	CH ₄	N ₂ O	F	SUM
1 Energy	118 246	629	1 331	0	120 206
1A Fuel combustion	118 113	245	1 331	0	119 689
1A1 Energy industries (including CHP)	36 607	18	218	0	36 843
1A2 Manufacturing industries and construction (without CHP)	26 224	58	83	0	26 364
1A3 Transport	24 741	22	876	0	25 638
1A4 Commercial / residential / agriculture	30 439	148	155	0	30 742
1A5 Other	102	0	0	0	102
1B Fugitive emissions from fuels	133	384	0	0	517
2 Industrial processes	12 469	58	3 239	2 367	18 134
3 Solvent and other Product Use	0	0	219	0	219
4 Agriculture	0	5 144	4 374	0	9 518
5 Land-Use Change and Forestry	0	0	0	0	0
6 Wastes	85	280	285	0	650
7 Other	0	0	0	0	0
Total	130 799	6 111	9 447	2 367	148 726

Year 2020

CRF format (kton CO ₂ -eq)	CO ₂	CH ₄	N ₂ O	F	SUM
1 Energy	120 242	635	1 383	0	122 260
1A Fuel combustion	120 122	250	1 383	0	121 755
1A1 Energy industries (including CHP)	39 254	20	231	0	39 505
1A2 Manufacturing industries and construction (without CHP)	25 392	57	84	0	25 532
1A3 Transport	25 014	21	915	0	25 950
1A4 Commercial / residential / agriculture	30 361	152	154	0	30 667
1A5 Other	102	0	0	0	102
1B Fugitive emissions from fuels	120	384	0	0	504
2 Industrial processes	12 369	58	3 446	2 465	18 338
3 Solvent and other Product Use	0	0	219	0	219
4 Agriculture	0	5 026	4 338	0	9 364
5 Land-Use Change and Forestry	0	0	0	0	0
6 Wastes	85	227	291	0	603
7 Other	0	0	0	0	0
Total	132 695	5 947	9 676	2 465	150 784

Overview

CRF format (kton CO ₂ -eq)	2006 (inventory 2009)	2010 (mean 2008- 2012)	2015	2020
1 Energy	110 902	110 283	120 206	122 260
1A Fuel combustion	110 351	109 753	119 689	121 755
1A1 Energy industries (including CHP)	27 822	27 533	36 843	39 505
1A2 Manufacturing industries and construction (without CHP)	27 550	25 151	26 364	25 532
1A3 Transport	26 062	25 765	25 638	25 950
1A4 Commercial / residential / agriculture	28 787	31 202	30 742	30 667
1A5 Other	130	102	102	102
1B Fugitive emissions from fuels	551	530	517	504
2 Industrial processes	14 427	16 238	18 134	18 338
3 Solvent and other Product Use	247	219	219	219
4 Agriculture	9 840	9 241	9 518	9 364
5 Land-Use Change and Forestry	0	0	0	0
6 Wastes	1 200	943	650	603
7 Other	0	0	0	0
Total	136 616	136 924	148 726	150 784

The greenhouse gas emissions in the with measures scenario (including all climate policy measures approved so far) are expected to remain approximately at the 2006 emission level up to 2010. The assumed increased electricity demand combined with the nuclear phase out, the assumed increase in iron and steel production and increased production in other industrial sectors are the main factors explaining the significant increase in emissions after 2010. Most of the nuclear capacity phased out is assumed to be replaced by new CCGT-power plants.

4. Emission projections covered by EU ETS versus allowances allocated in the National Allocation Plan

[this paragraph 4 includes corrigenda (marked in red) to paragraph 4 as mentioned in the report notified to EC on 15-May-09]

The tables below provide an estimate of the Belgian emission projections from the relevant sectors covered by ETS in 08-12 or 13-20 for the years 2010, 2015 and 2020. A distinction has been made whether the scope 08-12 or 13-20 of EU ETS is used.

‘Relevant’ CO₂ that has been taken into account in the table below, are CRF-categories 1A1 (‘Energy industries’), CRF-category 1A2 (‘Manufacturing industries and Construction’), CRF-category 2A1 (‘Cement production’), CRF-category 2A2 (‘Lime production’), CRF-category 2A7 (‘Others’), CRF-category 2B1 (Ammonia production in chemical industry’), CRF-category 2B5 (‘Other process emissions in chemical industry’) and CRF-category 2C1 (‘Iron and steel production’) **from the Walloon and Flemish Region from the ‘With measures scenario’.**

‘Relevant’ N₂O that has been taken into account in the table below, is CRF-category 2B2 (‘Nitric Acid production’) **from the ‘With measures scenario’**

Belgian emission projections for relevant CRF-categories			
	2010	2015	2020
‘relevant’ CO ₂	62 949	75 129	76 679
‘relevant’ N ₂ O	2 768	2 975	3 182
Total ‘relevant’ emission projections	65 717	78 104	79 861

The steep rise of CO₂-emissions between 2010 and 2020 relates mainly to projected emission growths in the electricity sector (CRF category 1A1) and the iron and steel sector (CRF-categories 1A2a and 2C1).

Of those ‘relevant’ projected emissions, an estimate has been made to identify whether emissions fall under ETS or not. For this exercise, the year 2010 takes into account scope 08-12, the years 2015 and 2020 take into account scope 13-20. **Following assumptions were made for the respective CRF-categories of both regions (expressed in percentages of ‘relevant’ emissions from the CRF-category that falls under the scope of ETS in 08-12 and 13-20 period). As based on assumptions, the percentages and resulting absolute projected emissions under ETS should be regarded as indicative.**

		under ETS in 08-12	under ETS in 13-20
1. Energy			
A. Fuel Combustion Activities			
1. Energy Industries			
	a. Public Electricity and Heat production	95,5%	95,5%
	b. Petroleum Refining	100%	100%
	c. Manufacture of Solid Fuels and Other Energy Industries	100%	100%
2. Manufacturing Industries and Construction			
	a. Iron and Steel	100%	100%
	b. Non-Ferrous Metals	91%	91%
	c. Chemicals	97%	97%

	d. Pulp, Paper and Print	90%	90%
	e. Food Processing, Beverages and Tobacco	85%	85%
	f. Other	85%	85%
2. Industrial Processes			
A. Mineral Products			
	1. Cement Production	100%	100%
	2. Lime Production	100%	100%
	7. Other	100%	100%
B. Chemical Industry			
	1. Ammonia Production	0%	100%
	2. Nitric Acid Production	0%	100%
	5. Other	0%	100%
C. Metal Production			
	1. Iron and Steel Production	100%	100%

When making those assumptions, the Belgian emission projections under ETS are:

Belgian emission projections under EU ETS			
	2010 (scope 08-12)	2015 (scope 13-20)	2020 (scope 13-20)
CO ₂ under EU ETS	57 047	72 075	73 545
N ₂ O under EU ETS	0	2 975	3 182
Total under EU ETS	57 047	75 050	76 727
% of total 'relevant' emission projections	87.0%	96.1%	96.1%

Comparison with Belgian National Allocation Plan 08-12

The mean allocation for sectors under ETS in 08-12 in Belgium (see Commission Decision on the Belgian NAP-table 08-12 of 10-Oct-08), amounts 292.472 mio. allowances for the 08-12 period, or 58.494 mio. allowances per year. This yearly amount incorporates an allocation to incumbents of 52.941 mio. allowances and a reserve of 5.553 mio. allowances.

Actual ETS emissions in 2008 for Belgium were 55.464 mio. emissions. The projected ETS emissions in 2010 (scope 08-12, see above) amount 57.047 mio. emissions. It will thus depend on the actual use of the New entrants reserve whether the allocation will be higher/lower than the verified emissions.

Effect of extension of the scope in 13-20

The extension of the scope in 13-20 will be responsible (indicated by the % of the total relevant emissions projections that fall under ETS) for more emissions from the above mentioned CRF-categories under EU ETS. This mainly relates to the fact that Belgium has an important chemical industry (f.e. two nitric acid production sites, ammonia plants and other process emissions from the chemical industry) .

- set up an operator that finances and organizes a system of third-investor adapted to residential sector.

6.2. WITH ADDITIONAL MEASURES PROJECTIONS

CRF format (kton CO ₂ -eq)	2006 (inventory 2009)	2010 (mean 2008- 2012)	2015	2020
1 Energy	110 902	110 065	115 324	111 465
1A Fuel combustion	110 351	109 535	114 807	110 961
1A1 Energy industries (including CHP)	27 822	27 629	35 494	35 687
1A2 Manufacturing industries and construction (without CHP)	27 550	25 134	26 298	25 521
1A3 Transport	26 062	25 710	24 671	24 142
1A4 Commercial / residential / agriculture	28 787	30 959	28 243	25 509
1A5 Other	130	102	102	102
1B Fugitive emissions from fuels	551	530	517	504
2 Industrial processes	14 427	16 238	17 383	17 838
3 Solvent and other Product Use	247	219	219	219
4 Agriculture	9 840	9 241	9 518	9 364
5 Land-Use Change and Forestry	0	0	0	0
6 Wastes	1 200	943	650	603
7 Other	0	0	0	0
Total	136 616	136 706	143 094	139 489

The additional measures represent an estimated total additional reduction of about 11.1 Mton CO₂ eq in 2020.

7. Conclusion

7.1. OVERALL EMISSION LEVELS

The total greenhouse gas emissions in the ‘with measures’ scenario remain approximately constant at the 2006 level until 2010 (**136.9 Mton CO₂-eq**) and increase afterwards up to **150.8 Mton** in 2020, which is largely due to the increased electricity demand, the planned decommissioning of the first nuclear reactors in 2015 and an increase in industrial production. These projections do not include emissions nor removals from LUCF.

Projections with the macro-economic model suggest a significant decrease in emissions between 2006 en 2010 (**130.4 Mton CO₂-eq**), resulting also in a lower emission level in 2020 (**139.0 Mton CO₂-eq**). Both model approaches suggest an increase of emissions after 2010.

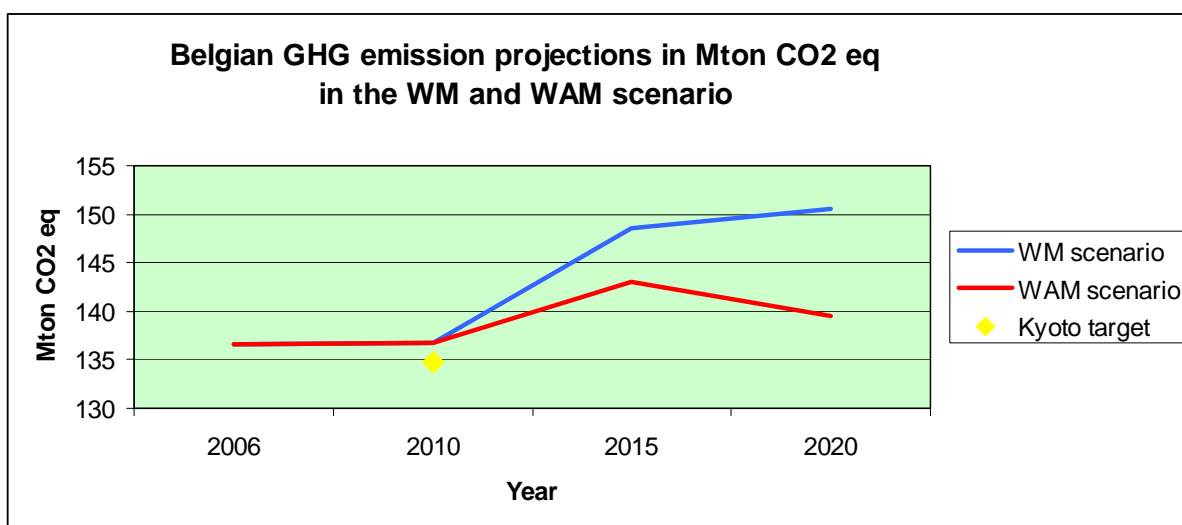


Fig. 1 Total Belgian GHG emission projection in the WM and WAM scenario (Mton CO₂ eq)

Uncertainties concerning exogenous variables such as economic growth, climate conditions, electricity imports exist and their level influences the resulting greenhouse gas emissions, notably in the sectors covered by the EU ETS.

The proposed additional measures show an additional reduction potential of 11.1 Mton in 2020, reducing the total CO₂-eq in the ‘with additional measures’ scenario to **139.5 Mton CO₂-eq**.

7.2 COMPARISON WITH THE KYOTO TARGET: NON-ETS EMISSIONS ARE THE DETERMINING FACTOR

The annual average quantity of allowances for Belgium in the Kyoto period equals 134.8 mio AAUs. The overall emission level in the ‘With Measures’ Scenario is 136.9 Mton CO₂-eq or 2 Mton CO₂-eq above this target.

With the approval of the National Allocation Plan for the period 2008 – 2012 however, the Kyoto target is translated into a target for the sectors not covered by the EU ETS. This target equals 76.3 Mton CO₂-eq⁸. Following the analysis in Chapter 4 of this section, the average non-ETS emission level in Kyoto period is estimated to be **79.9 Mton CO₂-eq**⁹ or **3.6 Mton CO₂-eq** above the target. This difference determines the amount of flexibility mechanisms Belgium will use in the Kyoto period (see Section 4 of this report).

⁸ The Belgian Kyoto target (134.8 Mton) – the mean Belgian ETS-cap for the 08-12 period (58.5 Mton)

⁹ The overall estimated emission level in 2010 is 136.9 Mton of which 57.0 Mton projected emissions estimated to be covered by the EU ETS (scope 08-12). The difference between the two is therefore the emission level not covered by the ETS.