

Report on greenhouse gas emissions resulting from the cultivation of agricultural raw materials for biofuel production

Belgium – Walloon Region

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A. Guns, Walloon Air and Climate Agency

1. Introduction

Sustainability criteria for biofuels and liquid biomass are laid down in Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC. One of these criteria is the greenhouse gas emission saving resulting from the use of biofuels and bioliquids which is taken into account (Article 17(2)).

Under Article 19(2), by 31 March 2010, Member States must submit to the Commission a report including a list of those areas on their territory classified as level 2 in the nomenclature of territorial units for statistics (NUTS) or as a more disaggregated NUTS level in accordance with Regulation (EC) No 1059/2003 of the European Parliament and of the Council of 26 May 2003 on the establishment of a common classification of territorial units for statistics (NUTS) where the typical greenhouse gas emissions from cultivation of agricultural raw materials can be expected to be lower than or equal to the emissions reported under the heading 'Disaggregated default values for cultivation' in part D of Annex V to the Directive, accompanied by a description of the method and data used to establish that list. The method must take into account soil characteristics, climate and expected raw material yields.

This report contains a description of the method and data used by the Walloon Region in line with the above-mentioned Articles of the Directive.

2. Methodology

2.1 Crops

The crops whose greenhouse gas emissions have been calculated are (part D or E of Annex V):

- wheat for bio-ethanol,
- beetroot for bioethanol,

- corn (maize) for bio-ethanol,
- rape seed for biodiesel and pure vegetable oil.

2.2 Data

The figures for yield and use of fertilisers and phytosanitary products per hectare in the Walloon Region come from the Directorate for Agricultural Economic Analysis (DAEA) of the Department for Country and Farm Studies (DEMNA) of the Operational Directorate-General for Agriculture, Natural Resources and the Environment (DGARNE).

These data are the Walloon Region's official farm accountancy statistics gathered in accordance with the relevant European obligations (Farm Accountancy Data Network 'FADN'). The 2005-2007 averages were used, except for phytosanitary products where only the 2008 data were available within the deadlines set.

The data on the use of fossil fuels are taken from the Walloon Region's Energy Statement, which is drawn up each by year by the Institute for Advice and Studies on Sustainable Development (ICEDD). In the case of corn and rape seed, for which no specific data are given by the ICEDD, the figures are those used by Valbiom (Valorisation de la Biomasse asbl)

The data on N₂O emissions from farmland are the figures calculated by the JRC using the DNDC model. On the basis of the European data, an emission of 0.024g N₂O /MJ has been calculated for wheat, for example, using this method.

The global warming potential (GWP) is that given in the Directive.

The lower calorific value of the fuels is that used for the annual greenhouse gas emission inventories reported under Decision 280/2004 (Monitoring Mechanism) and the United Nations Framework Convention on Climate Change (UNFCCC).

The lower calorific value (LCV) of the crops and certain sub-products is taken from the Fehrenbach study (2007).

The greenhouse gas emission coefficients expressed in grams of CO₂-eq per kg or by MJ or in MJf/kg are taken from the 2007 JEC. Each source is indicated in the last column of the tab 'RW data'.

2.3. Calculation

Given that the Commission has not provided a harmonised methodology, the JRC method, as set out in 'Well to Wheel' (<http://ies.jrc.ec.europa.eu/WTW>), has been applied.

This method takes account of the following parameters:

- Crop yield,
- Consumption of fossil fuel during agricultural activity,
- Emissions resulting from the production of mineral fertilisers (N, P₂O₅,K₂O),
- Emissions resulting from the production of phytosanitary products,
- Emissions resulting from seed production,
- N₂O emissions from farmland.

This is the method used by the European Commission for determination of the typical emission reductions set out in the Directive. It should therefore be used for this comparison.

The Excel calculation file is attached below:



It has been decided to express all substances relating to crops as quantities of dry matter.

As regards by-products, the greenhouse gas emissions have been split pro rata between the weight of the by-products and the fuel.

- For wheat, the by-products are DDGs (dried distilled grains with solubles).
- For beetroot, the by-products are pulp.
- For grain maize, the by-products are DDGs.
- For rape seed, the by-products are seedcakes.

3. Results

	(g CO ₂ /MJ etoh)	Wheat (grain)	Sugar beet	Maize for ethanol	Rape seed for biodiesel	Rape seed for PPO
NUTS 2	Brabant Wallon	15.7	9.3	10.5	21.6	23.1
	Hainaut	15.6	9.6	10.0	25.0	26.6
	Liege	14.1	8.9	9.6	23.1	24.6

	Luxembourg	14.0	8.7	8.8	22.0	23.5
	Namur	14.8	9.2	9.8	23.6	25.2
Region	Walloon Region	14.6	9.1	9.6	23.4	25.0
	Directive Limit Value	23	12	20	29	30