

GHG EMISSION FACTORS FOR DOMESTIC CONSUMPTION OF FERTILIZERS IN SPAIN

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Introduction

Fertilizers play a crucial role in the environmental impact of agriculture practices. Biofuels should fulfill sustainability criteria according to European Directive on renewable energies (2009/28/CE Directive), saving more than 35% of greenhouse gases emission in comparison with fossil fuels up to 2016, 50% in 2017 and 60% after 2018.

Fertilizers contribute, in a significant way to those emissions, mainly through two steps: fertilizers production emissions and emissions from field application.

This study is focused on the calculations to develop an emission factor to the main fertilizers consumed by energy crops cultivated in Spain.

Materials and Methods

Emission factors (E.F.) in fertilizers production from different sources have been evaluated and compared in order to develop a Spanish emission factor by each one of them.

The structure of domestic fertilizers consumption as well as the origin of fertilizers consumed in Spain has been supplied by ANFEE. Some of the products consumed in the country are domestically produced while others are imported.

Data from European Fertilizer Manufacturers Association (EFMA), Ecoinvent database and BIOGRACE project have been used from foreign fertilizers consumed in Spain. Emission factors to fertilizers imported from European Union have been taken from Biograces additional standard values (BASV), those imported from non EU countries have been taken from Biograces standard values (BSV). Data from fertilizers produced in Spain have been collected from Fertiberia (Spanish company that is involved in the certification process of its emission, after incorporating the best available practices in its factories)

Results and Discussion

Spanish E.F. has been calculated using the fertilizers origin and their percentage of the total consumption and the available E.F. When national data are accessible, this value is taken into account. If contrary, 'general' E.F. is considered (Biograces data). Finally, a weighted average is built using all the data (origin, percentage and available E.F.) above mentioned.

Spanish E.F. for N fertilizers is 4.3 kg CO₂eq/kg N, for P fertilizer is 0.78 kg CO₂eq/kg P₂O₅ and finally for K fertilizer the specific E.F. is 0.42 kg CO₂eq/kg K₂O.

The use of these new factors has an important impact in the overall GHG emissions savings attained by biofuels.

This study has been carried out in the framework of collaboration between CIEMAT and IDAE to develop the Spanish biofuel calculator "CALCUGEI"

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 [2] BIOGRACE. www.biograces.net/
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 [5] EFMA. European Fertilizer Manufacturers Association. 2008. 2. 012
 [6] Fertiberia. Personal communication. 2012

Overview of Spanish fertilizers consumption

