ROADMAP TO THE RSB TOOL: EXTENSION OF THE SUSTAINABILITY QUICK CHECK FOR BIOFUELS (SQCB) FOR GREENHOUSE GAS CALCULATIONS ACCORDING TO THE EUROPEAN RENEWABLE ENERGY DIRECTIVE (RED)

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ABSTRACT: The Sustainability Quick Check for Biofuels (SQCB) is a web-based tool for the evaluation of biofuels on an LCA basis. It allows calculating the global warming potential, as well as the as overall environmental impacts of the biofuels' life cycle. The tool was first based on the requirements for the Swiss ordinance on mineral oil tax. EMPA will expand the SQCB to include the Roundtable on Sustainable Biofuels (RSB) Certification Standard. The first step in this process is to include the regulatory requirements of the European Renewable Energy Directive 2009/28/EC of April 23, 2009 (RED), in particular the calculation of the greenhouse gas emissions according to the RED methodology. The implementation of the calculation of greenhouse gas emissions according to the Renewable Energy Directive will allow producers and importers to calculate the GHG emissions of their biofuels for the European context while profiting from the flexibility and comfort of the Sustainability Quick Check for Biofuels

Keywords: Biofuels, sustainability, certification, LCA, environmental impacts, greenhouse gas emissions

1 INTRODUCTION

The Sustainability Quick Check for Biofuels (SQCB) is a web-based tool for the evaluation of biofuels on an LCA basis [1]. It allows calculating the global warming potential, as well as the as overall environmental impacts of the biofuels' life cycle. The tool was first based on the requirements for the Swiss ordinance on mineral oil tax.

EMPA will expand the SQCB to include the Roundtable on Sustainable Biofuels (RSB) Certification Standard [2]. This project aims at adapting the SQCB to be the "RSB one-stop-shop tool" to enable a participant to verify his/her compliance with all applicable standards of the RSB certification system and with regulatory requirements in the markets that the biofuel is intended for. The first step in this process is to include the regulatory requirements of the European Renewable Energy Directive 2009/28/EC of April 23, 2009 (RED) [3], in particular the calculation of the greenhouse gas emissions according to the RED methodology. This paper describes the extension of the SQCB towards inclusion of the RED requirements.

2 MATERIALS AND METHODS

2.1 Concept of the SQCB tool

Figure 1 represents the workflow of the SQCB tool. In a first step, the user enters own data for the most relevant parameters of the product life cycle. In step two, the SQCB calculates the life cycle inventory data of the biofuel based on the user's data completed with background data from the ecoinvent database. In step three, the resulting material flows and emissions are assessed using the Swiss method of the ecological scarcity (ecopoints/UBP 2006) [4] and the global warming potential over 100 years (GWP 100a). In step four, the results are benchmarked against the Swiss criteria for the tax exemption of biofuels, or, in a future version, with other sustainability standards. Furthermore, the user can evaluate the critical factors of his value chain. If the criteria are not fulfilled, the user can change his entry data and so get more insights on the measures he should take to fulfill them. Based on such insights, the user can decide if he should invest in a sustainability certification or if major project revisions have to be implemented first.

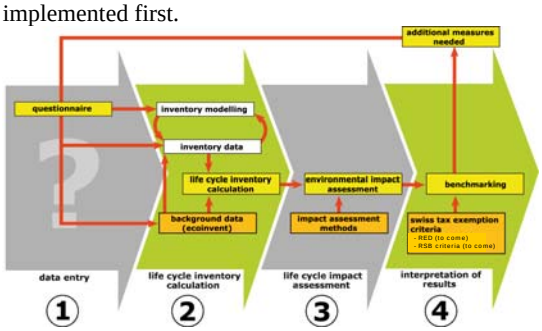

Figure 1: Workflow of the sustainability quick check tool

2.2 Adaptation for RED methodology

The adaptation of the SQCB for the calculation of greenhouse gas emissions according to the Renewable Energy Directive (RED) requires changes on two levels: first, on the level of the questionnaire and second on the level of the calculation routines. The main differences between the approaches for the Swiss legislation and for the European Renewable Energy Directive 2009/28/EC are the functional unit, the system boundaries, the allocation method and the greenhouse gas emissions that are considered.

Functional unit for the Swiss legislation is person-kilometer, which means one kilometer driven by one person, whereas the Renewable Energy Directive accounts for 1 MJ combusted. The system boundaries are therefore different, as the Swiss approach includes the car and the infrastructure related to it. The Swiss legislation defines the mixed allocation method as used in the ecoinvent database [5], whereas the RED use energy allocation. Further, the RED considers only CO_2, CH_4 and N_2O, whereas the Swiss methodology takes into account the greenhouse gases according to IPCC.

The main adaptations in the tool are the extension of the questionnaire to account for aspects related to RED. For example, the lower heating value of products and co-products needs to be known for the calculation of

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allocation factors on the basis of the energy content. Furthermore, the database has to be extended to include greenhouse gas emissions results which are calculated with the RED methodology for the inputs in the life cycle of biofuels. Furthermore, the tool must account for the fact that the RED methodology does not consider the use of the biofuel in the car as well as the infrastructure.

2.3 Open questions relating to the Directive

The Renewable Directive does not give guidance on all issues of the calculation of greenhouse gas emissions for a biofuel life cycle chain. Following points are open:

- The RED does not give standard LHV values for products and co-products
- The question if dry (only vapour formed) or wet (includes water content) LHV should be used for allocation is not defined
- There are no guidelines for the calculation of N2O
- There are no guidelines for the calculations of greenhouse gas emissions due to land use change
- The baseline for adjustment of vehicle efficiency (Annex V, part C, Paragraph 3) is not defined.

The communication of the European Commission, which was due at the beginning of 2010, may give some clarification on these points.

3 CONCLUSION AND OUTLOOK

The implementation of the calculation of greenhouse gas emissions according to the Renewable Energy Directive will allow producers and importers to calculate the GHG emissions of their biofuels for the European context while profiting from the flexibility and comfort of the Sustainability Quick Check for Biofuels (Figure 2).

Figure 2: Web page of the sustainability quick check tool with the extension for calculations of greenhouse gas emissions according to the RED.

In a next step, the SQCB will be extended to a "one-stop shop" tool for the Roundtable on Sustainable Biofuels (RSB). This will allow the calculation of the GHG emissions according to RSB methodology, checking against RSB principles and criteria, the assessment of risk class and the integration of benchmarked sustainability schemes (e.g. Rainforest Alliance). Furthermore, it will be designed as a multi-user tool, so that applicants can fill in a project and insert data from other applicants and calculate the greenhouse gas intensity of the whole biofuel production chain.

The main functions of the tool will be:

- Information (information on RSB certification schemes, links to relevant organizations)
- Evaluation (Scorecard („quick check"), Risk assessment, Self-evaluation against RSB principles and criteria, GHG calculations)
- Support for application for the RSB certification

6 REFERENCES

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5 LOGO SPACE

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