

Sustainability Quick Check for Biofuels (SQCB):

A Web-based tool for streamlined biofuels' LCA

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Upcoming regulations like the Swiss ordinance on mineral oil tax and development of standards for sustainably produced biofuels like those of the Roundtable for Sustainable Biofuels usually require calculations of the greenhouse gas emissions or even of the environmental impacts on a LCA basis. For many small producers, such an evaluation is too costly and would prevent them to enter the market for biofuels. This project develops a web-based tool, the so-called Sustainability Quick Check for Biofuels (SQCB), which allows a “quick check” of common agro-biofuel on a LCA basis. The major goal of the SQCB is (i) to facilitate the entrance in the global market of sustainable biofuels for local producers and (ii) to increase for the know-how on the environmental performance of specific agro-biofuel production chains.

The SQCB uses a simplified approach. The life cycle inventory is modeled based on a questionnaire including the decisions and factors having the highest influence on the environmental performance of an agro-biofuel value chain. One important factor as regards the GHG emissions are the carbon dioxide emissions resulting from direct land use change (LUC). In its first version, the SQCB simply accounts for CO₂ emissions resulting from the transformation of natural ecosystems to cropland. The user has to define the former land use at the reference date (01.01.2004). By means of the Stock-Difference Method, the difference in the carbon content between both the natural and the managed ecosystem is computed and related to the functional unit. In this context, the SQCB refers to standard values and change factors determined by the IPCC Guidelines 2006 (tier 1 methodology). Other relevant parameters which could be entered are mineral and organic fertilizers, pesticide use, energy consumption, efficiency and co-product allocation. The questionnaire offers the possibility of using standard values if specific data are not known. In this case, the SQCB relies on theecoinvent database for the background data.

Based on specific user data, an inventory is modeled and linked with background data for a full life-cycle impact assessment. Results show the greenhouse gas potential (GWP100) as well as overall environmental impacts (UBP06) of the biofuels' life cycle in relation to a biogenic and a fossil fuel reference both tabular and graphical. On this basis, the user can (i) assess if the biofuels produced comply with the Swiss sustainability standards and (ii) determine the hot spots in his biofuel value chain. In addition, the SQCB enables the user interactively to understand the influence and interaction of different decisions and factors on the environmental performance of his biofuel value chain.

However, the simplified modelling approach of the SQCB is also the weakest point of the tool. SQCB must be seen as a rapid screening that gives a first estimate on the overall sustainability and potentially critical factors of a biofuel production chain. Based on this screening it can be decided, if one should apply for a sustainability label or if major project revisions have to be implemented first. Thanks to its modularity, it should be possible to adapt the SQCB to make it valid for other certification schemes like e.g. the Roundtable for Sustainable Biofuels.

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