Sphera® GaBi
Documentation on Evaluation of Land Use Change Emissions in GaBi 2022

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Customer Care

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Introduction

Emissions from land use change (LUC) in LCA have become an important issue. Therefore, we decided to introduce this feature in the GaBi datasets. We give you the opportunity to introduce or to omit emissions from LUC in your calculations – this is supported by respective variants of the LCIA methods delivered with all GaBi Databases.

How to deal with LUC in GaBi Software

CO_2 emissions related to LUC are managed in a transparent way at each step of your GaBi model, from process/plan to LCIA. In order to illustrate how GaBi manages LUC and associated CO_2 emissions in this document, one example is shown in the next paragraphs.

The chosen example is the process: "Soybean at field border (13% H2O content)" from the GaBi Extension database XII: Renewable materials, as depicted in Figure 1. In the process, CO_2 emissions related to LUC will appear in the output table of your process as *"Carbon dioxide (land use change) [Inorganic emissions to air]"*.

Figure 1: Input-Output table of Soybean at field border (13% H2O content) in Brazil. The flow carbon dioxide (land use change) is highlighted.

In case you calculate the results of your process/plan (in this example only the process "BR: Soybean at field border (13% H2O content)" is considered), you can obtain the results as presented in Figure 2. To obtain the results you have to calculate them via right click on the process or the results calculation button in a plan.

1. Choose the "Results" tab;

2. Activate quantity view;

3. Open the LCIA methodologies via double click on "environmental quantities";

4. Choose an impact assessment method e.g. in this example CML with a double click on CML 2001 – Jan. 2016. The approach is the same for any other GWP impact assessment method.
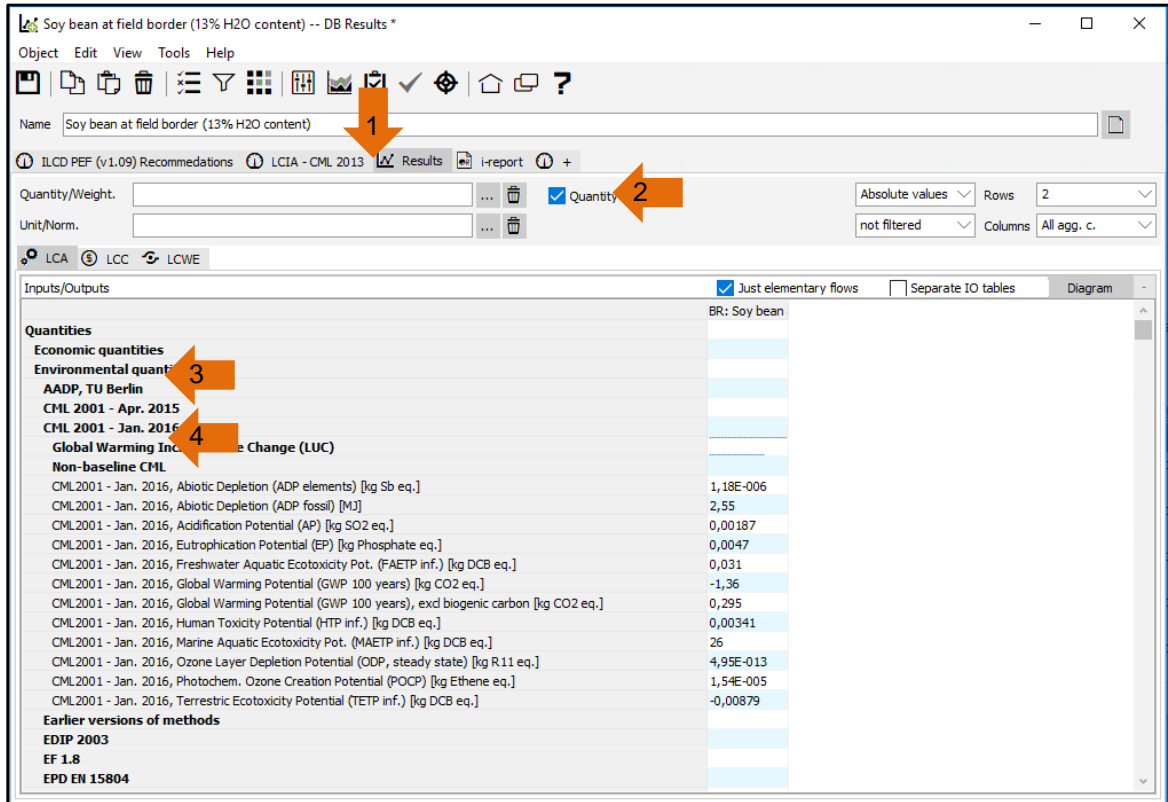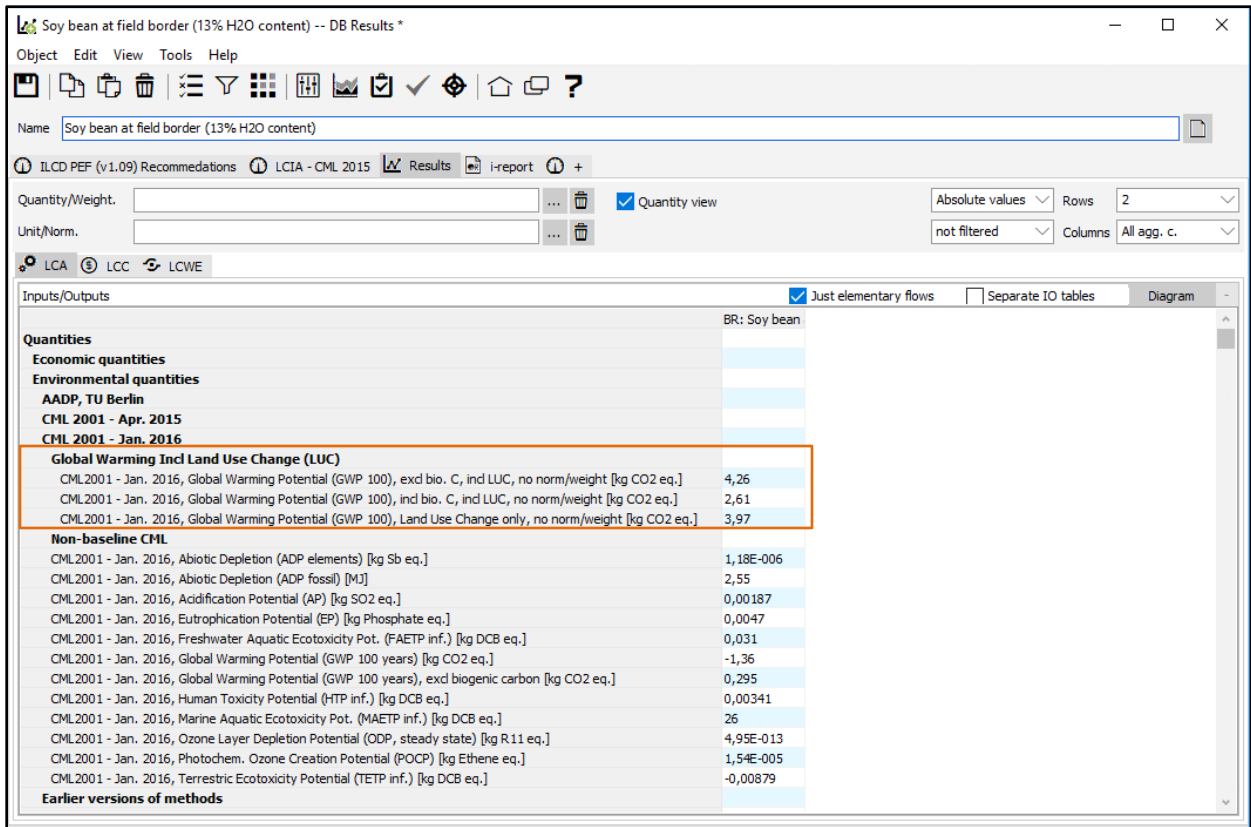

Figure 2: Results (quantity view) of Soybean at field border (13% H2O content) in Brazil

In order to obtain the focus on GWP including emission from LUC, perform another double click on *Global Warming Incl Land Use Change (LUC)*. A table like the one showed in Figure 3 will be presented with the details about several GWP emissions. CML 2001 – Jan. 2016 considers:

- Global Warming Potential (GWP 100), excl biog. C, incl LUC, no norm/weight [kg CO_2-Equiv.];

- Global Warming Potential (GWP 100), incl biog. C, incl LUC, no norm/weight [kg CO_2-Equiv.];

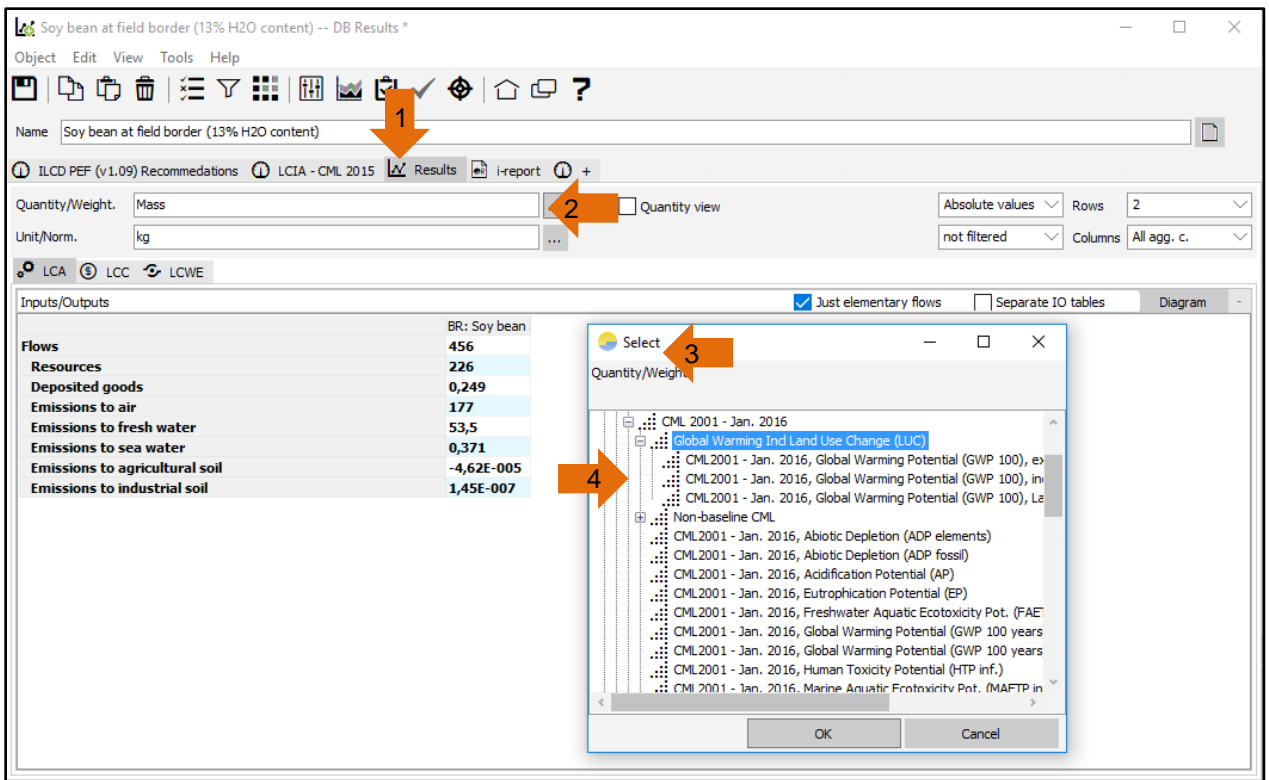- Global Warming Potential (GWP 100), Land Use Change only, no norm/weight [kg CO_2-Equiv.].

Figure 3: Results (quantity view) of Soybean at field border (13% H2O content) in Brazil, the impact assessment with LUC is highlighted.

ANOTHER OPTION TO ASSESS GWP INCLUDING LAND USE CHANGE

The user can choose to create its own table and present GWP emissions linked to LUC as well as other impact assessment categories, or specific flows. In your results window, the following procedure has to be done (see Figure 4 for one selected example):
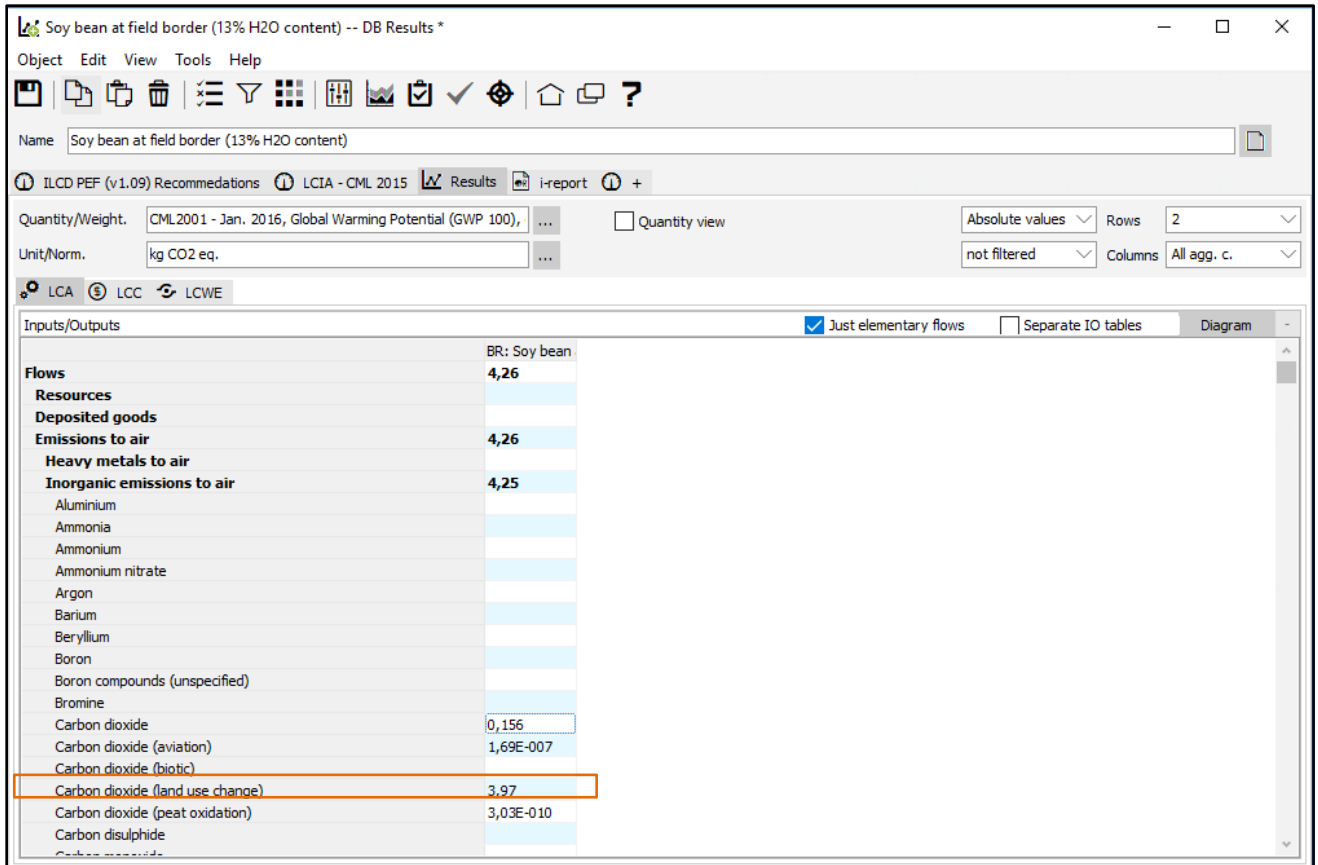
1.   Choose the "Results" tab;

2.   Click on the triple points after Quantity/Weight box

3.   "Select" Window will appear

4.   Scroll in the "select" window and choose the impact category you want to display.

Figure 4: Results of Soybean at field border (13% H2O content) in Brazil, the impact assessment with LUC is highlighted.

After following the aforementioned procedure described in Figure 4, you will obtain a table like the one presented in Figure 5 which presents you three GWP quantities, e.g. the *Global Warming Potential (GWP 100), excl biog. C, incl LUC, no norm/weight*.

Figure 5: Results of Soybean at field border (13% H2O content) in Brazil, the impact of emissions from LUC is highlighted.

Emissions from LUC and respective impact assessment can be displayed with other options as well, e.g. via the dashboard.