Sphera® Managed LCA Content (MLC)

Land Use Change LCI Modelling & Assessment 2024

Sphera Land Use Change LCI Modelling & Assessment 2024

April 10, 2024

Customer Care

For assistance or inquiries regarding Sphera LCA for Experts (LCA FE) or Managed LCA Content (MLC), contact Customer Care:

- Visit the Sphera Customer Network (SCN) at SCN.Spherasolutions.com. To access frequently asked questions and to report any issues using the SCN, you must request a user name and password.
- Send an email to customercare@sphera.com

Table of Contents

Introduction

Emissions from land use change (LUC) in LCA have become an important issue. Therefore, we decided some years ago to introduce this feature in our managed LCA content 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 our databases.

How to model LUC and related emissions in LCA for Experts Software with MLC Databases

CO_2 emissions related to LUC are managed in a transparent way at each step of your LCA model, from process/plan to LCIA. In order to illustrate how LCA for Experts 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% H_2O content)" from the managed LCA content 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% H_2O 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% H_2O 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. Select the **Results** tab.

2. Click the checkbox to activate the **Quantity** view.

3. Double-click **Environmental quantities** to open the LCIA methodologies.

4. Select an impact assessment method. For example: Double-click CML 2001 – Jan. 2016.

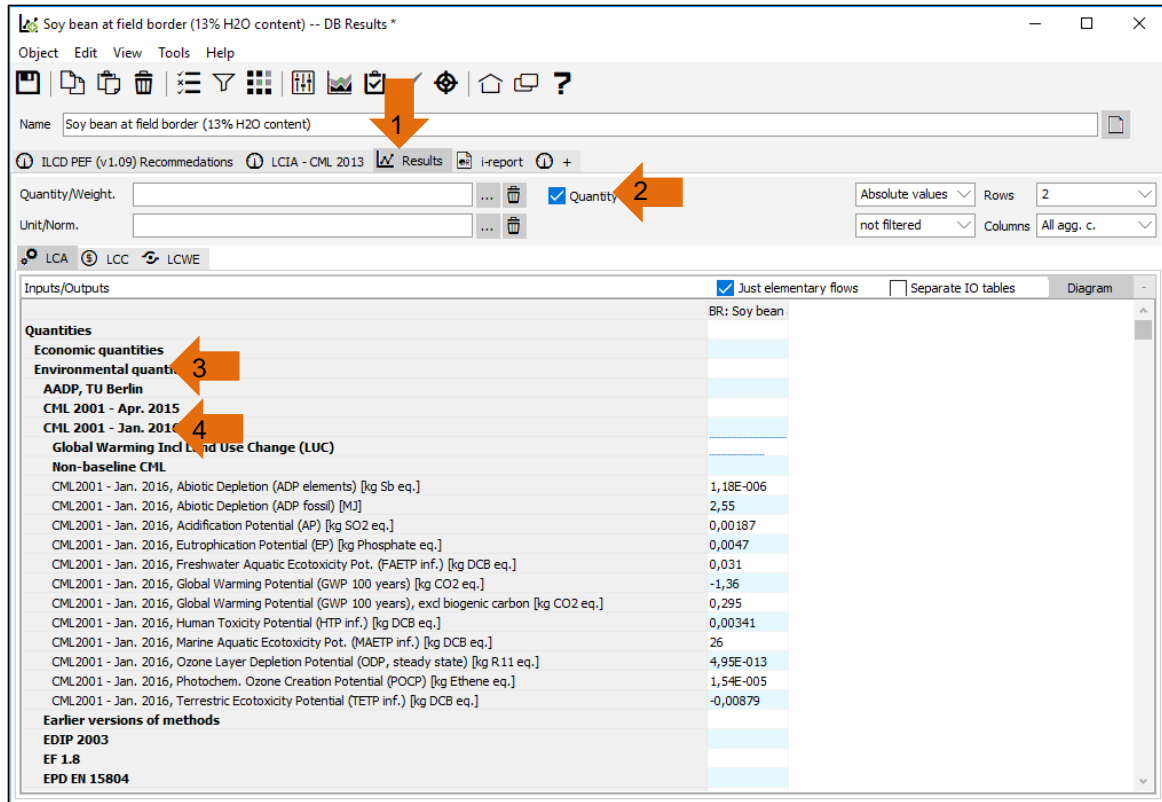   **Note**: The approach is the same for any other GWP impact assessment method.

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

5. To obtain the focus on GWP, including emission from LUC, double-click **Global Warming Incl Land Use Change (LUC)**.

    A table like the one shown in Figure 3 is 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 CO2-Equiv.];

    *   Global Warming Potential (GWP 100), incl biog. C, incl LUC, no norm/weight [kg CO2-Equiv.];

    *   Global Warming Potential (GWP 100), Land Use Change only, no norm/weight [kg CO2-Equiv.].
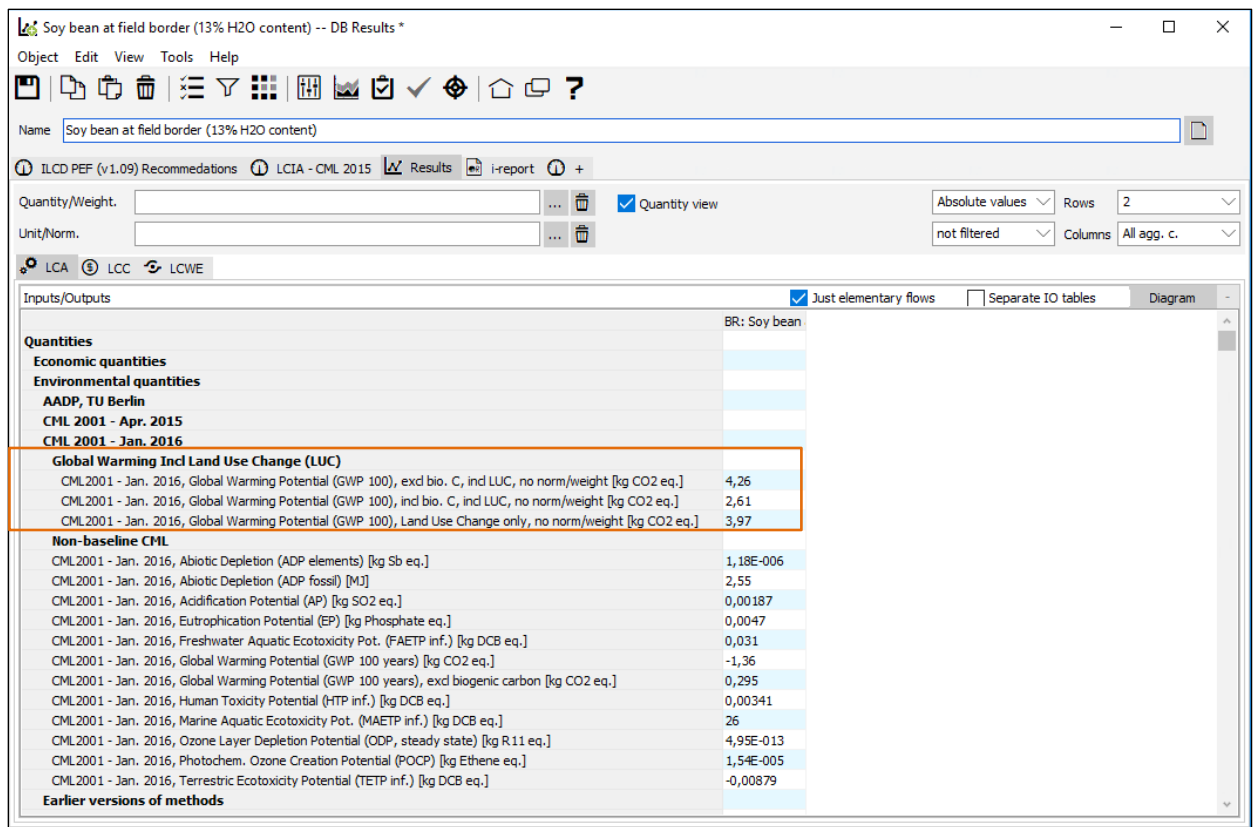
Figure 3: Results (quantity view) of Soybean at field border (13% H2O content) in Brazil, the impact assessment with LUC is highlighted.

Another Option to Assess GWP Including Land Use Chance

As a user, you can choose to create your 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 must be completed (see Figure 4 for one selected example):

1. Select the **Results** tab.

2. Click ⋯ (**More**) after the Quantity/Weight field.

    The Select Window is displayed.

3. In the Select window, scroll and choose the impact category you want to display.
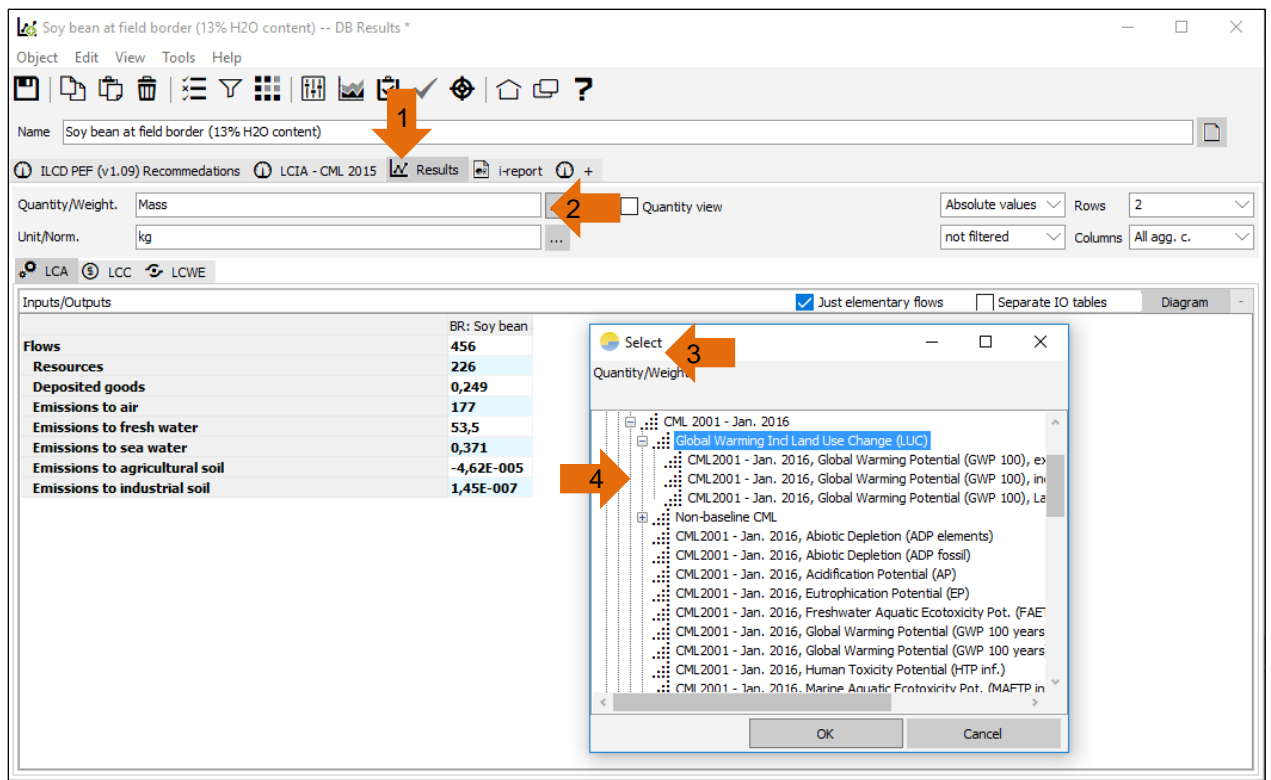
Figure 4: Results of Soybean at field border (13% H_2O content) in Brazil, the impact assessment with LUC is highlighted.

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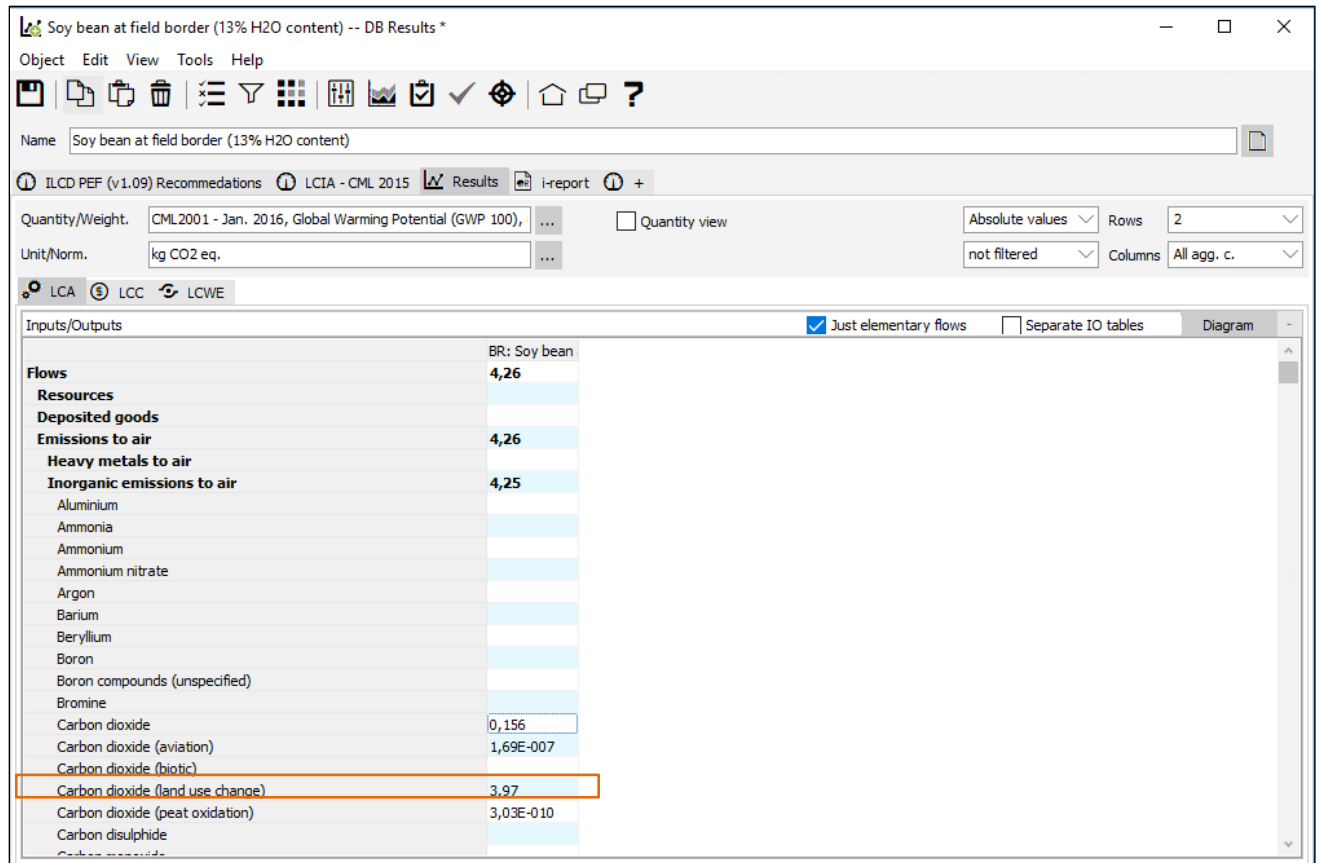

Figure 5: Results of Soybean at field border (13% H_2O content) in Brazil, the impact of emissions from LUC is highlighted.

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