



SUPPORTING INFORMATION FOR:

Joyce, P. J., and A. Björklund. 2021. Futura: A new tool for transparent and shareable scenario analysis in Prospective Life Cycle Assessment. *Journal of Industrial Ecology*.

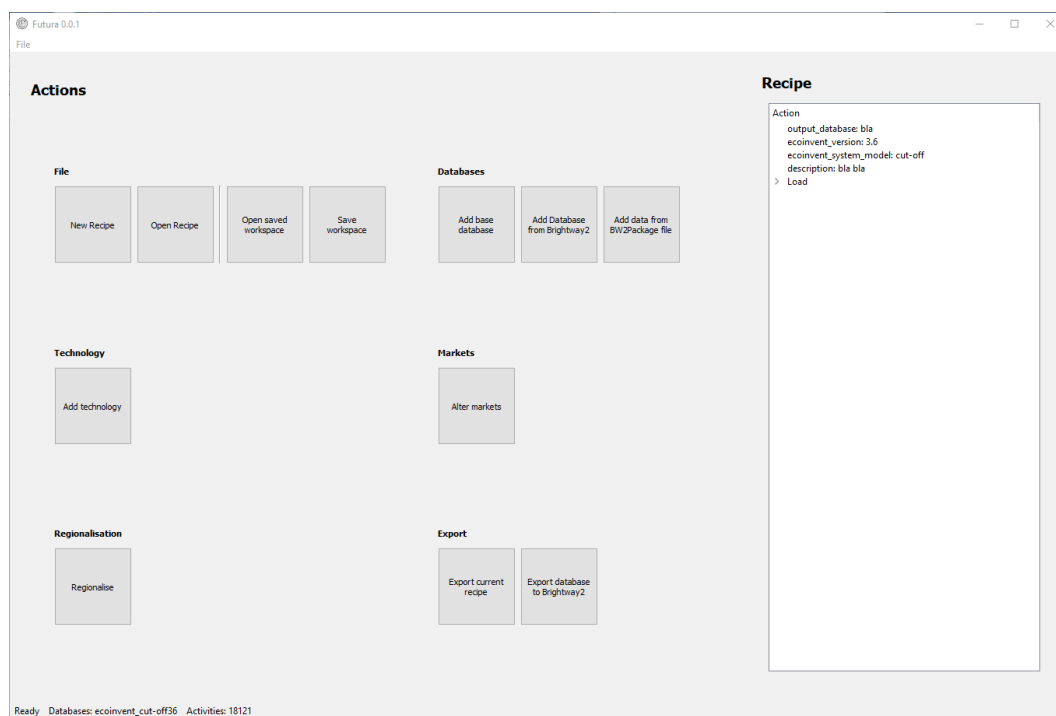
Summary

This supporting information S1 provides instructions for reproducing Example 1 in the main document using the Futura software.

Instructions for reproducing Example 1 in Futura GUI

Install and open Futura UI

- Download and install Futura according to the instructions at <https://futura.readthedocs.io/en/latest/>
- Launch the futura UI by typing 'futura' at the command line



Create a new recipe with the ecoinvent 3.6 database as the base database

- Click on the 'New Recipe' button
- When prompted give the recipe a suitable name and description, and select ecoinvent 3.6 cut-off as the base database
- When asked if you want to load the ecoinvent 3.6 cut-off database now, select 'yes' and enter your ecoinvent login details

Import CARMA datasets

- Download the CARMA CCS datasets from <https://github.com/pjamesjoyce/futura/blob/master/futura/assets/lci-Carma-CCS-base-GLO2.xlsx>
- Click on the 'Add technology' button, and choose the excel file downloaded in the previous step

Regionalise CARMA datasets

- Click on the 'Regionalise' button
- In the first step of the regionalisation wizard enter the following filters:
 - o Database – Equals – Carma CCS
 - o Name – Contains – lignite
 - o Name – Contains – post
 - o Reference product – Contains – electricity

- Click on the Test button to make sure you get one result
- *Note: You can regionalise multiple process in one go with filters which return more than one result*
- Click Next
- On the second screen, click on the arrows to navigate through the location tree to find Germany (Global > Europe & Russia > Europe > Europe without Switzerland > Germany)
- *Note: You can choose as many regions as you like in this step*
- Click Next
- Review your choices and confirm
- Repeat these steps replacing 'Name – Contains – lignite' in the filter with 'Name – Contains – coal'

Replace lignite and coal in the German high voltage electricity markets

- Click on the 'Alter markets' button
- In the first step of the market wizard enter the following filter:
 - o Name – Equals – market for electricity, high voltage
 - o Location – Equals – DE
- *Note: clicking on the globe icon in the location filter opens the location tree*
- Click 'Test' to check you get one, and only one, result

Market Wizard

Choose a market to edit

On this page you will set up a filter to choose a market to edit.

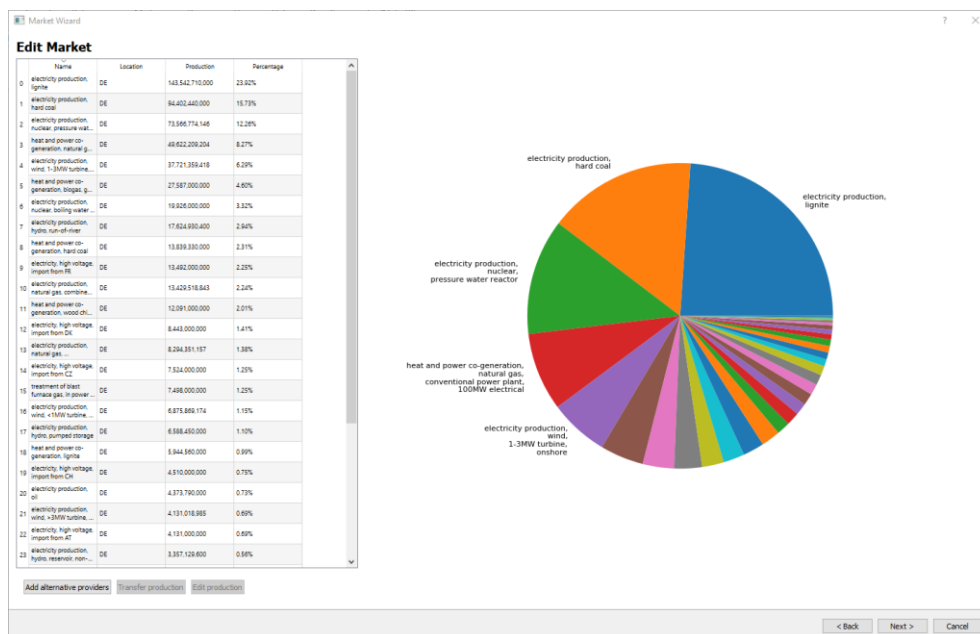
On the next page you will be able to edit the market.

Name:

Location:

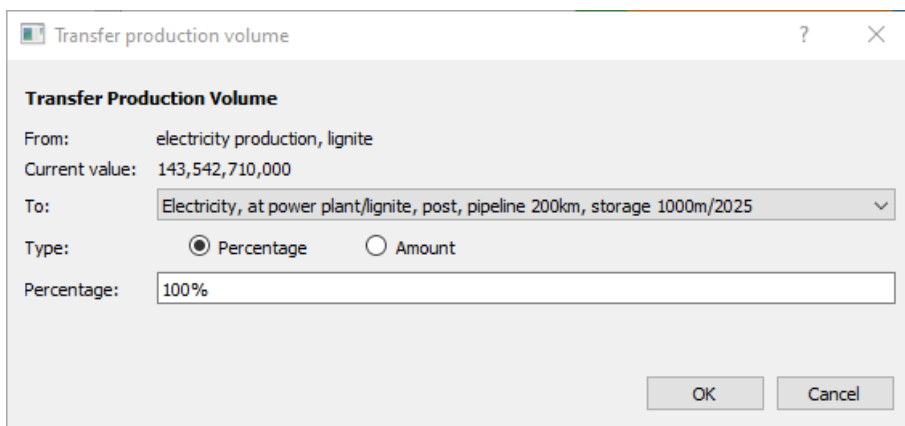
1 result found - market for electricity, high voltage (klowatt hour) [DE]

- Click Next
- Click on the 'Add alternative providers' button – this will add the newly regionalised CCS processes to the table on the left hand side of the screen



- Select the 'electricity production, lignite' entry at the top of the table
- Click on the 'Transfer production' button

- Choose the correct CCS process from the dropdown menu
- Select 'percentage' as the transfer type
- Enter 100% in the percentage box
- Click OK



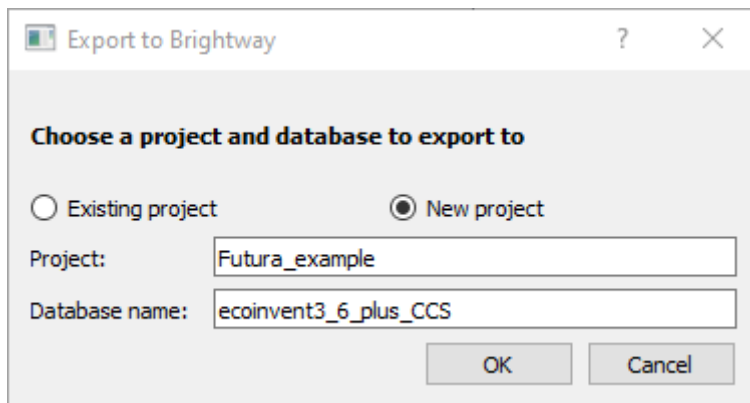
The dialog box is titled "Transfer production volume". It contains the following fields and controls:

- From:** electricity production, lignite
- Current value:** 143,542,710,000
- To:** Electricity, at power plant/lignite, post, pipeline 200km, storage 1000m/2025 (dropdown menu)
- Type:** ☒ Percentage ☐ Amount
- Percentage:** 100% (text input field)
- Buttons:** OK, Cancel

- Repeat this process for 'electricity production, hard coal'
- Click Next
- Check and confirm

Export to Brightway2 for analysis

- Click on the 'Export database to Brightway2'
- Use the dialog box to choose an existing project or create a new one, and choose a database name
- Click OK



The dialog box is titled "Export to Brightway". It contains the following fields and controls:

- Choose a project and database to export to**
- ☐ Existing project ☒ New project
- Project:** Futura_example (text input field)
- Database name:** ecoinvent3_6_plus_CCS (text input field)
- Buttons:** OK, Cancel

Export Futura Recipe

- Click on the 'Export current recipe' button
- Save the recipe file