

Documentation of changes implemented in the ecoinvent database v3.10.1 (2024.11.19)

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1 Summary of updates in v3.10.1 and consequences on LCIA scores

Version 3.10.1 of the ecoinvent database includes two important corrections to specific datasets of version 3.10, which are described in the following sections.

The combined effects on LCIA scores resulting from the implementation of these two corrections on the database for v3.10.1 can be analysed in more detail in the accompanying LCIA Score Comparison files, which are provided alongside the Change Report Annex.

1.1 Emissions to air in coke production

The exchange amounts were wrong for some emissions to environment in the datasets for “coke production, wet quenching” in CN and “coke production” in GLO, which resulted in wrong emission amounts in all four system models. The exchange amounts that have been corrected for version 3.10.1 can be found in the Change Report Annex.

As coke is a fuel used in most supply chains, this error affects the LCIA scores of the majority of the datasets in version 3.10 of the database.

The scores of a large number of datasets are higher than what they should be in v3.10 for the following impact categories:

- ecosystem quality
- ecotoxicity
- human health
- human toxicity

It is important to mention that all other impact categories, including climate change, are not affected at all by this issue.

As a result of the correction, LCIA scores for the impact categories listed above have significantly decreased for most datasets in all four system models.

1.2 Production volumes in markets for electricity in Brazil

A mistake in the order of magnitude of the production volumes (PV) of the Brazilian electricity markets was found in version 3.10: PVs of the BR markets are 1'000 times too small in v3.10, for all three voltage levels (high voltage, medium voltage, and low voltage).

The Brazilian (BR) electricity markets supply the Region Latin America (RLA) market groups. The supply share of markets to market groups is calculated based on the production volumes of the markets that supply the given market group. Due to the error in the scale of the PVs of the Brazilian markets, in v3.10 the contribution of Brazilian markets to the RLA market groups is much smaller than what it should be.

The consequence of this issue is that land use-related climate change and biogenic climate change impacts are significantly underestimated in v3.10 for many datasets. Additionally, the scores of water use indicators are also underestimated, but to a lesser extent. These two effects on the LCIA scores stem from the fact that the Brazilian electricity mix has a larger

share of hydropower compared to other countries contained in the RLA geography. Total climate change is affected in a noticeable way for about only 15 datasets.

Therefore, with the correction applied for v3.10.1, the LCIA scores for the indicators mentioned above have increased significantly for a large number of datasets in the database.

However, as the Consequential system model uses prospective data for modelling future electricity market mixes, it is not affected by this issue.