



The ecoinvent database - linking to the global market

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The challenge

- LCA studies human activities and their **global** interlinkages through **geographically differentiated physical** and **economical** causalities.
- **The challenge for a database:** How to capture all the interlinkages while still being simple enough to be updated frequently with a minimum of effort?



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The ecoinvent v3 solution: - combining flexibility and simplicity

- Markets: Flexible linking of transforming datasets
- Completeness: A context for embedding new datasets
- Parameterisation
- Features allowing to model constraints



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Product markets: Flexible linking of transforming datasets



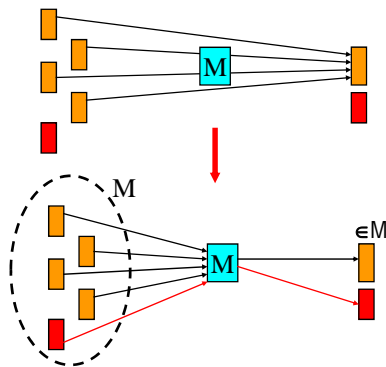
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Unlinked datasets with
product markets

Datasets linked,
based on geographical
location

- New datasets **automatically** linked to their suppliers and market
→ more frequent updates of the database possible

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Completeness: A context for embedding new datasets



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- All human activities covered, at different levels of detail
- With a global reference dataset for each transforming dataset
- All market datasets exist at least at the global level
- When both global and local datasets exist, a Rest-of-World dataset is calculated and used in linking
- All new datasets are disaggregations of existing datasets
 - in terms of technology of the activity, or
 - in terms of geography
- Any new dataset is immediately placed - and linked - into its right context, without requirements on the data provider to provide links
- The database continually improves, without any need for action from database administration

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Completeness in indicators

- Completeness is also sought for in:
 - **Environmental** indicators (indirect land use, water, noise, toxics, etc.)
 - **Social** indicators (occupational health, excess work, workplace stress, un-organised labour, injuries, etc.)
- **Economic** externalities are internalised through the modelling of physical causalities (e.g. road construction, hospital costs)



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Parameterisation

- Parameterisation within datasets:
 - Formulas → entering data directly as in source; easier to discover and correct errors; better documentation
 - Dataset-internal parameters → reduce redundancy; fewer datasets; easier maintenance
 - Properties of exchanges (e.g. prices, dry mass, water and carbon content) → balances as error check; different allocation models applied to the same data
- Parent/child relationships (inheritance) between a global parent dataset and geographical and temporal children → easier construction of regionalised and forecasted data



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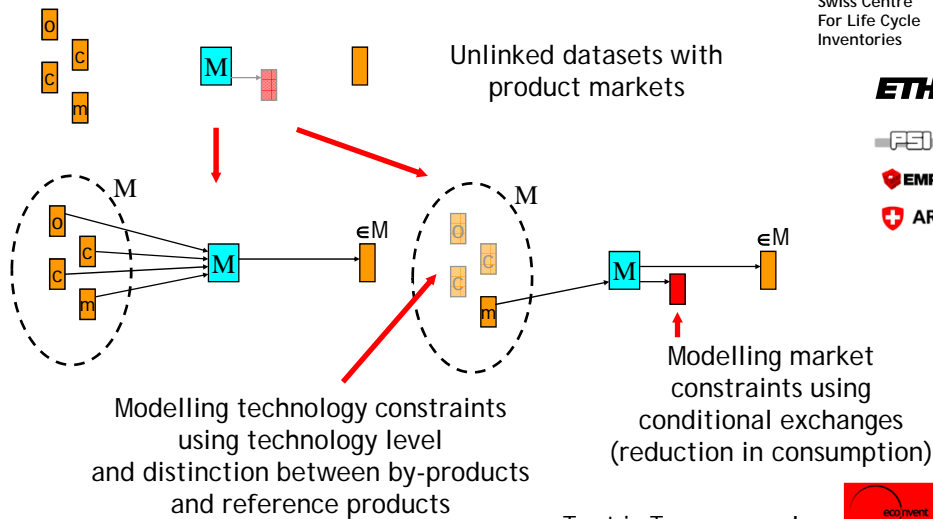
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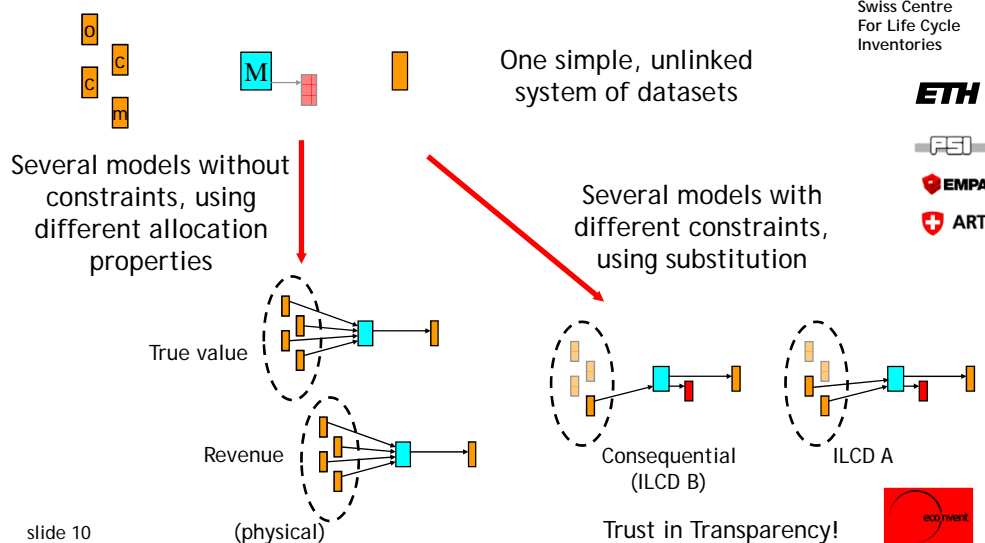
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Features allowing to model constraints



Simple: One unlinked system Flexible: Many derived models



Conclusions

- The ecoinvent v3 solution meets the challenges of modern LCA:
 - Global coverage with geographical differentiation
 - Modelling both physical and economical causalities
 - Flexibility for different applications
 - Allowing for frequent updating
- While reducing the required efforts for data providers:
 - Automatic linking
 - Support for calculations directly in the dataset
 - Less redundant data entries and maintenance, with parameters
 - More automatic validations, incl. mass and economic balances
 - Easier construction of regionalised data using inheritance
 - No additional data needed for allocation and substitution



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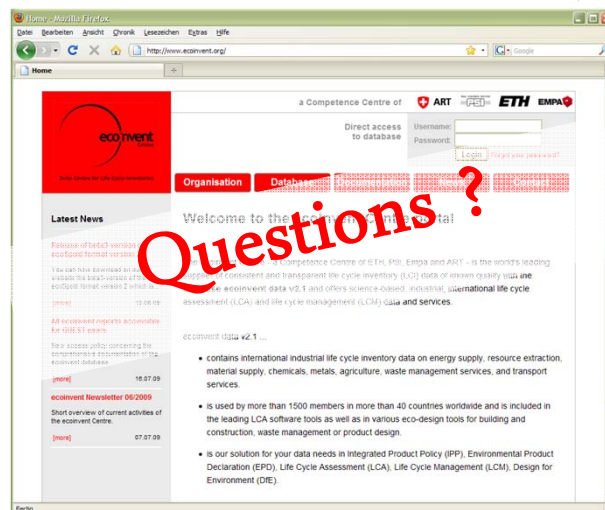
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