

Development plans for the ecoinvent LCI database

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The ecoinvent database v.2.0

- More than 4000 generic LCI process datasets on energy supply, resource extraction, material supply, chemicals, metals, agriculture, waste management services, and transport services
- Used by more than 1500 members in more than 40 countries
- Included in the leading LCA software and eco-design tools
- Online access to LCI and LCIA results for all datasets
- Based on industry data, compiled by independent experts
- Consistent, validated and transparent
- Continuously maintained
- International in scope, including e.g. data on US agriculture, worldwide sourcing of raw materials and production of electronics in Asia



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Mission statement

- To be the preferred source for LCI data worldwide, and thereby promote the use and good practice of LCI.

Strategic objective

- To provide the most *relevant, reliable, transparent* and *accessible* LCI data for users worldwide

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Plans for the ecoinvent database v.3.0 - release 2011

- Co-operation with national database initiatives
- More detail, more technologies, more completeness:
 - International editorial board and broader supplier base
 - Parameterisation (geography, time, technologies)
 - Prepared for integration with supply-use data, for completeness and easier production of national versions
 - New indicators
- Better support for alternative modelling options (consequential, attributional, etc.)
- More frequent updating
- Improved uncertainty estimation and calculation facilities

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The ecoinvent offer to national database initiatives

- National initiative is responsible for their own local data collection programme, and retains the right to license the collected data to third parties, while providing the collected data for publication in the ecoinvent database
- ecoinvent provides the necessary infrastructure for validation and publishing of the data as part of the ecoinvent database
- Free ecoinvent licenses to all active in the national initiative
- Both sides can terminate the co-operation with one years notice to the end of a calendar year.



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International editorial board and broader supplier base

- International editorial board
 - Activity editors, for each industry activity and for household activities
 - Cross-cutting editors, to ensure consistency and monitor developments across the entire database, both for specific (groups of) emissions, for geographical areas, scenarios, etc., and for the meta-data fields, e.g. uncertainty
- Broader supplier base
 - Making it easier for experts and lay users to contribute with new data or corrections to existing data
 - All such contributions will still be subject to our strict quality control, review, and validation procedures before entering into the database



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Parameterisation

- Dataset-internal parameters
- Geographical parameters in the form of GIS coordinates:
 - All other area parameters can be expressed as ranges of GIS coordinates: Country codes, areas with different population densities, habitat areas, watershed areas, etc. for site-dependent impact assessment
 - Core international datasets + national differences
- Temporal parameters (years)
- Scenario parameters (e.g. BaU, optimistic, pessimistic)



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Prepared for integration with supply-use data

- Link to monetary and physical supply-use tables
 - Ensures completeness of process database
 - Allows easier production of national versions
 - Opens up for new applications: LCC, Material Flow Analysis



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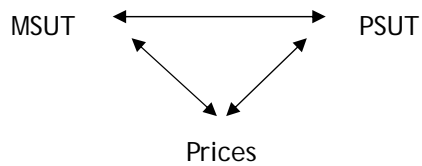
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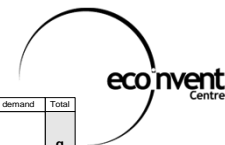


Monetary and physical supply-use tables

Balanced MSUT	Activities (a_{ij})	Products (c_{ij})	Export	Total
Activities (a_{ij})		V		g'
Products (c_{ij})	U		E	q
Import		N'_V		
Primary inputs	Labour and profit			
Total	g	q'		



Balanced PSUT	Activities (a)	Products (c)	Final demand			Total
Activities (a)		V				g
Products (c)	U		y	E_c	E_w	q
Import		N'_c				
		N'_w				
Stock changes	$-\Delta S$					
Supply of residuals	$-W_V$					
Use of residuals	W_U					
Resources	R					
Emissions	$-B$					
Water balancing	Q_{H2O}					
Total	g^*	q'				



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Supply-use framework ensures completeness

- All economic activities in society are covered, i.e. the sum of all activities = national output
- Per process/industry, all monetary inflows are traced to monetary outflows (intermediate inputs or value added), i.e. no upstream cut-offs
- Per product/commodity, what is produced must be used, i.e. ensuring complete product balances across the economy



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Easier production of national process databases

- Most countries produce monetary supply-use tables annually, which can serve as a basis for consistent national versions of the core ecoinvent database
- This may then be supplemented by specific national process data



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Supply-use framework opens up for new applications of the database

- Life Cycle Costing (LCC):
 - Consumer spending always ends up as value added → Life cycle cost = price of products = value added over the life cycle
 - Because labour costs, taxes & subsidies, rents & profits (together = value added) are standard elements of the supply-use framework, LCC are calculated automatically along with all the other inventory results
 - Price rebound effects can be calculated from data on average or marginal consumption
- Material Flow Analysis (MFA):
 - Completeness of material balances across the economy gives insights into material flows



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Better support for alternative modelling options

Attributional and consequential modelling:

- Average versus marginal market modelling
- Allocation versus substitution (system expansion)
- The unallocated (multi-functional) unit processes are the same for both models



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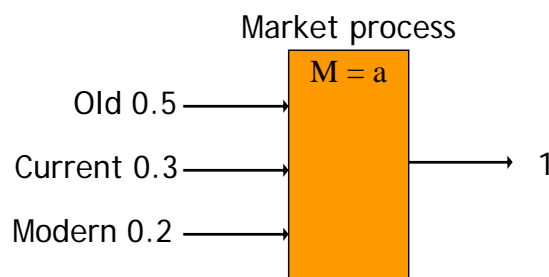
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Attributional and consequential market models



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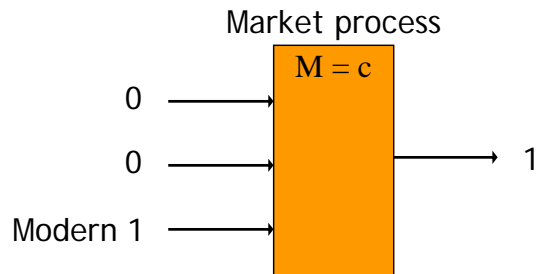
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Attributional and consequential market models



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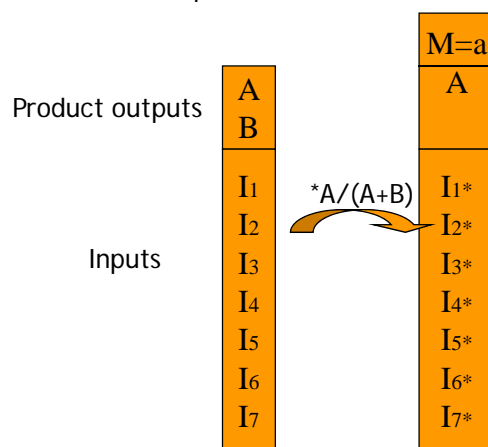
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Allocation

Multifunctional process Allocation relative to A



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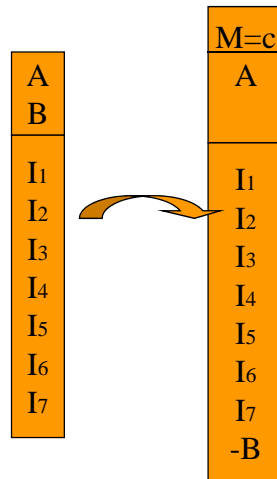
Substitution (system expansion)

Multifunctional process

Substitution relative to A

Product outputs

Inputs



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Better support for alternative modelling options

- The unallocated (multi-functional) unit processes are the same for the attributional and consequential system models
- The difference between the models lie exclusively in the market processes and the formulae applied for converting multi-functional processes to single-functional.
- By introducing a database-wide modelling parameter ("a/c"), the relevant market process and allocation formulae can be applied consistently when calculating the accumulated (cradle-gate) results.



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More frequent updating

- Larger data supplier basis: Continuous improvement
- Database structure (parameterisation, supply-use framework) allows for more smooth updating
- Maintaining backwards traceability, so that a result obtained at a specific point in time can always be reconstructed (and compared to the current version).



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Improved uncertainty estimation and calculation facilities

- Improving scientific validity of pedigree matrix
- Taking co-variance into account through parameterisation
- Considering how to make uncertainty information more complete and readily available



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Thanks for your attention!



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