

ecoSpold version 2 improved data format meeting the challenges of future LCI databases



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ecoinvent Centre

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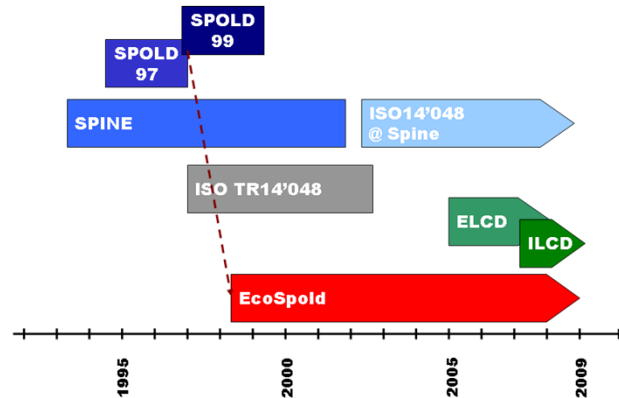
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ecoSpold version 1

Historical facts



- ... is « Open source »
- ... is available as an import (and partly as an export) interface implemented by all major LCA software providers

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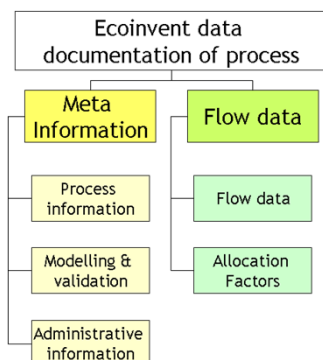
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ecoSpold version 1

Historical facts

ecoSpold v1 ...



- ... is Compliant with ISO/TS 14048;
- ... enables extensive documentation, individual determination of allocation factors, confidential data management (if required);
- ... facilitates the communication between LCA practitioners;
- ... is working, is widely applied (e.g. US, AUS, ecoinvent, ...) and accepted;

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Motivation

Drivers for the revision of the ecoSpold format

- Databases grow, and maintaining consistency between datasets over geographies and time become an increasing concern
- Increasing flexibility of application for different models (attributional, consequential, substance flow analysis, life cycle costing, IO-LCA, equilibrium models)
- Removing annoying issues discovered during use of version 1
- Support for more language versions
- Support for formulas, images, numerical data quality indicators, multiple classifications, tags
- Taking advantage of new IT developments (e.g. UUIDs)
- Data exchange to ILCD



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Timetable

Revision process for version 2

- 06/08 • Ecoinvent ad hoc Working Group on Database Structure with 12 selected experts
- 03/09 • Open hearing (October-December 2008)
- 03/09 • First public beta May 2009
- 08/09 • Separate meeting with ILCD developers to ensure easy conversion
- 08/09 • Second public beta August 2009 with conversion tool from v1
- 08/09 • Editing tool (ecoEditor 2) under development (internal testing)
- 08/09 • Extensive testing during the next half year
- 02/10 • Final release early 2010
- 02/10 • Implementation in ecoinvent database for 2011 release



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What is new?

1) Facilitating database maintenance & extension

- Option for parent-child relationships between activity datasets
- Option for expressing geographical information using GIS coordinates
- Option to use formulas and variables in numerical fields
- Use of UUIDs for internal references in datasets
- New field to declare macro-economic scenario for forecasted activities

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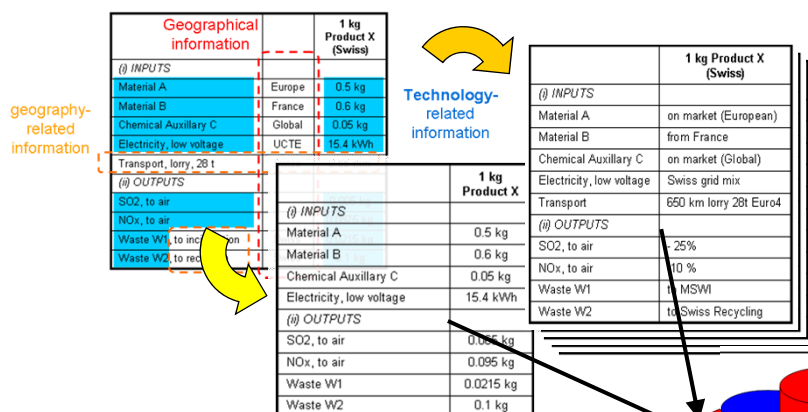
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What is new?

1) Facilitating database maintenance & extension

(i) parent-child relationship



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What is new?

- 1) Facilitating database maintenance & extension
- (ii) geographical information

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EcoSpold02 Schema Documentation - Mozilla Firefox

File:///C:/Documents and Settings/All Users/Documents/Arbeitsdaten/a. ecoinvent Centre/16 Transformation f... Google

EcoSpold02 Schema Documentation

Geography

Multiple occurrences: No Required: Yes

Contains information about the geographic validity of the process. The geography may be the point location of the activity, a line describing a mobile activity, or an area of a distributed activity or of a production mix, containing several located activities. For markets (consumption mixes), the geography describes the market boundaries, across which imports and exports are limited.

Name	FieldID	SpoldID, version 1	Options	Type	Size	Multiple Occurrence	Req	Multi Language
@geographyId	400	new		TUuid	36	No	Yes	No
locationShortname	410	662		TString40	40	No	No	Yes
generalComment	420	663		TTextAndImage		No	No	Yes

Reference to valid locations file with detailed geography information.

Optional descriptive shortname of the location referenced by geographyId, e.g. the regional codes of EcoSpold version 1.

Free text for further explanations. Especially for area descriptions, the nature of the geographical delimitation may be given, especially when this is not an administrative area. Justifications for market boundaries may also be provided here.

List of text, imageUri and variable elements. The text and imageUri elements can be used to describe the current section and they can be combined in any order given by their index attribute. Text variables are defined by the variable elements, which may be used in the text as {{variablename}}. If a parent text field includes a variable, this variable may be redefined by the child activity dataset while keeping the rest of the parent text intact. This allows easy changes of text parts in child processes.

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What is new?

- 1) Facilitating database maintenance & extension
- (ii) geographical information

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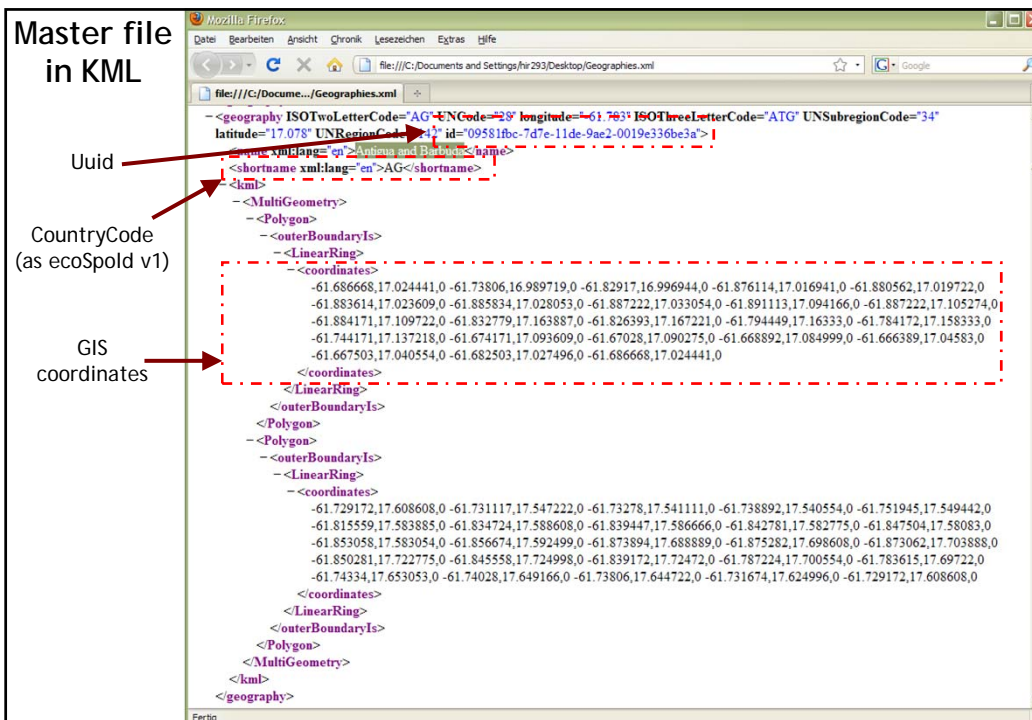
- More than just „countryCode“ ...
 - ... point sources,
 - ... linear sources,
 - ... specific surface area
- KML format
- Default values for all countries / regions (similar to ecoSpold v1) in separate KML file



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What is new?

2) support for alternative modelling options

- Option to use **tags & multiple classification schemes** for activities and products, of which the "category/subcategory" classification for activities is only one
- Option to declare **market model** (attributional, consequential) used for an activity
- **Separate names for activities (processes) and products**, allows flexible linking between activities via markets
- **New field to declare an activity as a market activity**
- **New field to declare technology level** (new, modern, current, old, outdated) for activities, for use in identification of marginal suppliers to a market
- Reduction of the number of required fields
- Addition of **joker elements** to enable simpler extension of format



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What is new?

3) Support for mass, energy & monetary balances

- Option to add multiple properties of exchanges, e.g. price, dry mass, water content, energy content, elementary or substance composition
- New numerical field to declare annual production volume
- New output type: "addition to capital goods"
- New field to declare product transfer coefficients (outputs relative to inputs)



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What is new?

4) Support for languages / better documentation

- Support for language versions
 - Option to add language versions for all text fields
- Support for better documentation
 - Option to add images
 - Option to add more than one validator
 - Fields for uncertainty information made more general and new numerical fields for the 5 data quality indicators



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Compatibility & Implementation



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- Compatibility with ecoSpold version 1:
 - Forwards compatible (converter from v1 to v2)
 - NOT backwards compatible (too many new fields and functionalities), however
 - Does NOT *require* database changes in LCA software, except the ability to read ecoSpold 2 files
- Compatibility with ILCD format:
 - Complete, with use of additional namespaces
 - Converter to ILCD under development (expected November)
 - ecoEditor v2 can then also be used to produce ILCD datasets

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Compatibility & Implementation



ecoEditor 2 - under internal testing ...

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Exchange						hardwood, at forest road [RER]	power sawing, with catalytic converter [RER]	power saw, with catalytic converter [RER]	construction, forest road [RER]	petrol, two-stroke blend, at regional storage [RER]	diesel, burned in building machine [RER]
Type	Name	Unit	Compartment	Subcompartment	Link	Amount	Amount	Amount	Amount	Amount	Amount
0-ReferenceProduct	construction, forest road	m							1		1
0-ReferenceProduct	diesel, burned in building machine	MJ									1
0-ReferenceProduct	petrol, two-stroke blend, at regional storage	kg								1	
0-ReferenceProduct	power saw, with catalytic converter	unit					1				
0-ReferenceProduct	power sawing, with catalytic converter	h									
2-ByProduct	residual wood, hardwood, under bark, u=80%, at...	m3				0.49					
2-ByProduct	round wood, hardwood, under bark, u=70%, at...	m3				0.51					
4-ToEnvironment	Carbon dioxide, fossil	kg	air	low population de...			3.53	10		0.8	0.0904
4-ToEnvironment	Carbon monoxide, fossil	kg	air	low population de...			0.163	2		0.0005	0.000435
4-ToEnvironment	Lead	kg	air	low population de...			8.74E-05	1		4.76E-07	3E-08
4-ToEnvironment	Methane, fossil	kg	air	low population de...			0.00161	4		0.004	0.00013
4-ToEnvironment	Nitrogen oxides	kg	air	low population de...			0.0168	3		0.0016	0.00108
4-ToEnvironment	NM VOC, non-methane volatile organic compou...	kg	air	low population de...			0.079	5		0.012	0.000378
4-ToEnvironment	Sulfur dioxide	kg	air	low population de...			0.000806	6		0.008	0.000139
4-ToEnvironment	Carbon dioxide, in air	kg	resource	in air		119					
4-FromEnvironment	Carbon dioxide, in air	m2a	resource	land		214					
5-FromTechnosphere	construction, forest road	m				0.0771					
5-FromTechnosphere	diesel, burned in building machine	MJ				51.5			0.242		
5-FromTechnosphere	petrol, two-stroke blend, at regional storage	kg					1.68				
5-FromTechnosphere	power saw, with catalytic converter	unit					0.0002				
5-FromTechnosphere	power sawing, with catalytic converter	h				0.962					

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Conclusion



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ecoSpold v2 data exchange format:

- Remains open source and flexible for different applications
- Meets the challenges raised by recent and expected developments in LCA modelling, the growth in data availability, and the expansion of the application area for LCI data
- Is expected to be implemented in all major LCA software by 2011



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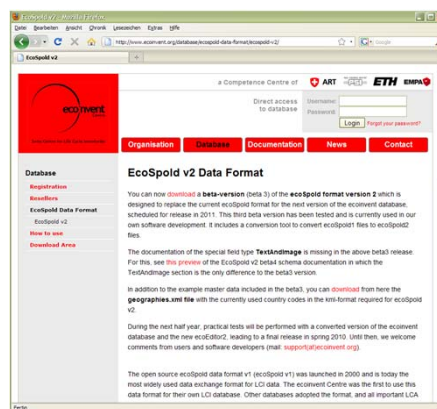
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Thank you



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<http://www.ecoinvent.org/database/ecospold-data-format/ecospold-v2/>

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