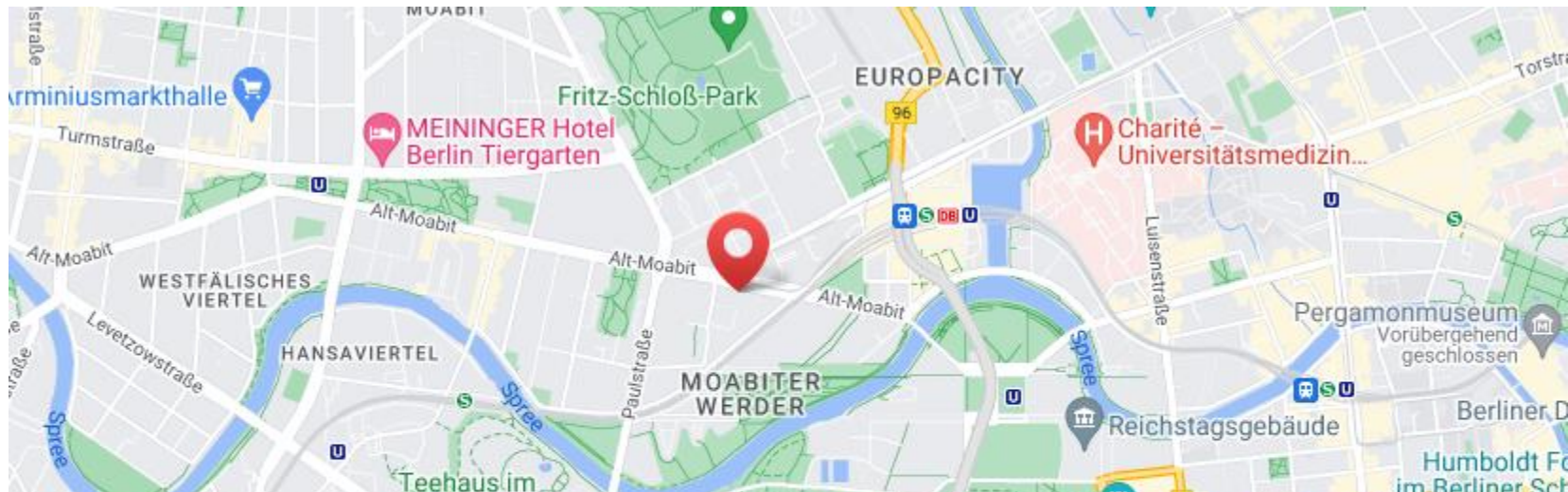


# How to develop EPDs with openLCA

**Dr. Andreas Ciroth**  
CEO, GreenDelta GmbH

# GreenDelta GmbH

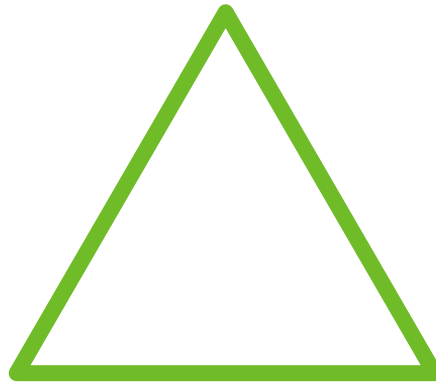
- Founded by Dr. Andreas Citroth in 2004
- Developers of the openLCA software
- Recognised experts in LCA & sustainability, worldwide
- Located in Berlin
- Global partners worldwide (11 countries)
- Worldwide projects and clients
- Around 30 employees



# GreenDelta, main activities

## Sustainability consultancy and research

environmental LCAs, resource criticality, social LCAs, Life Cycle Costing, Circular Economy, SSbD, EPDs



Database development  
and distribution

Software development,  
especially open source



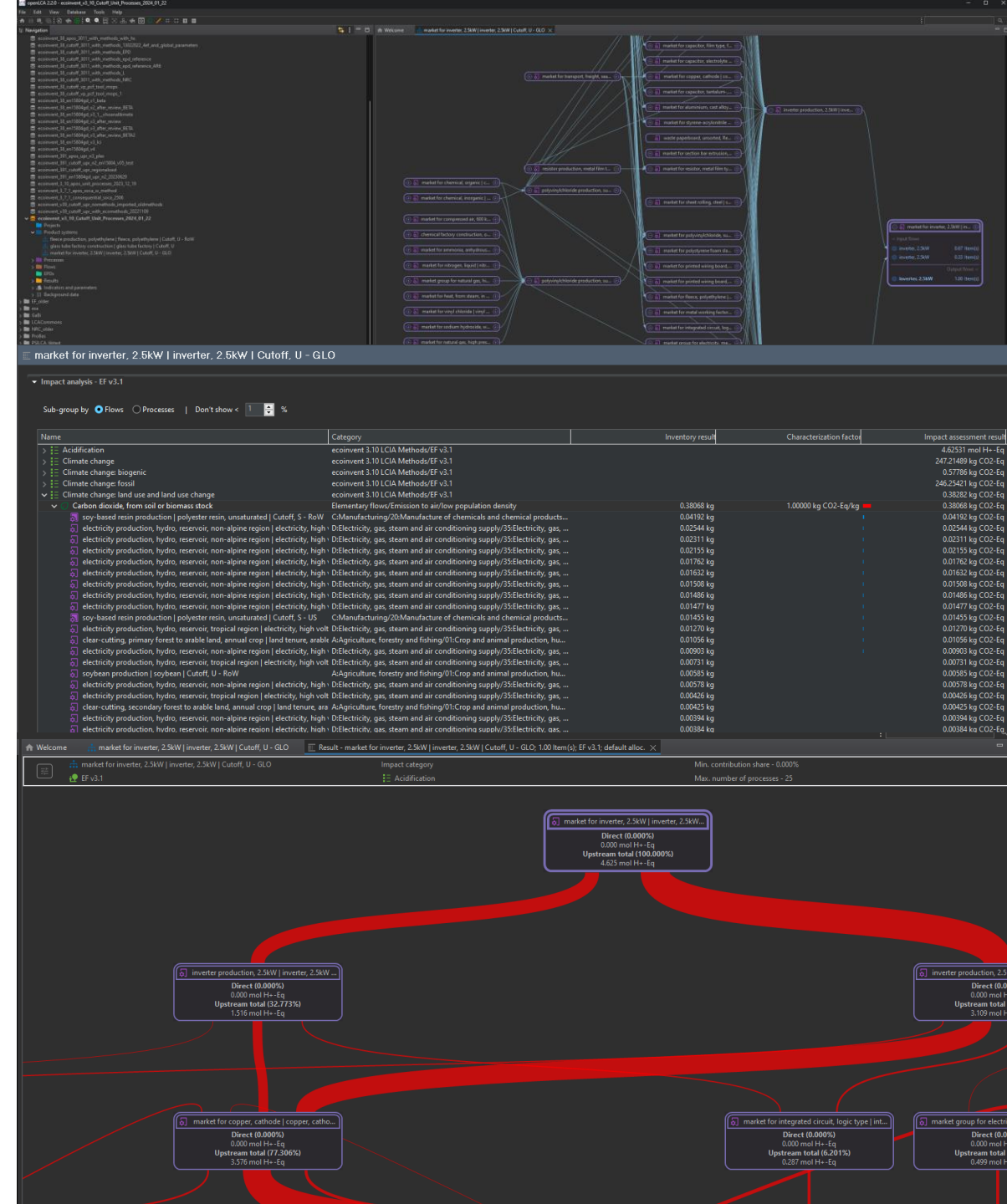
# GreenDelta, team

(photo from the  
openLCA conference,  
April 2024)

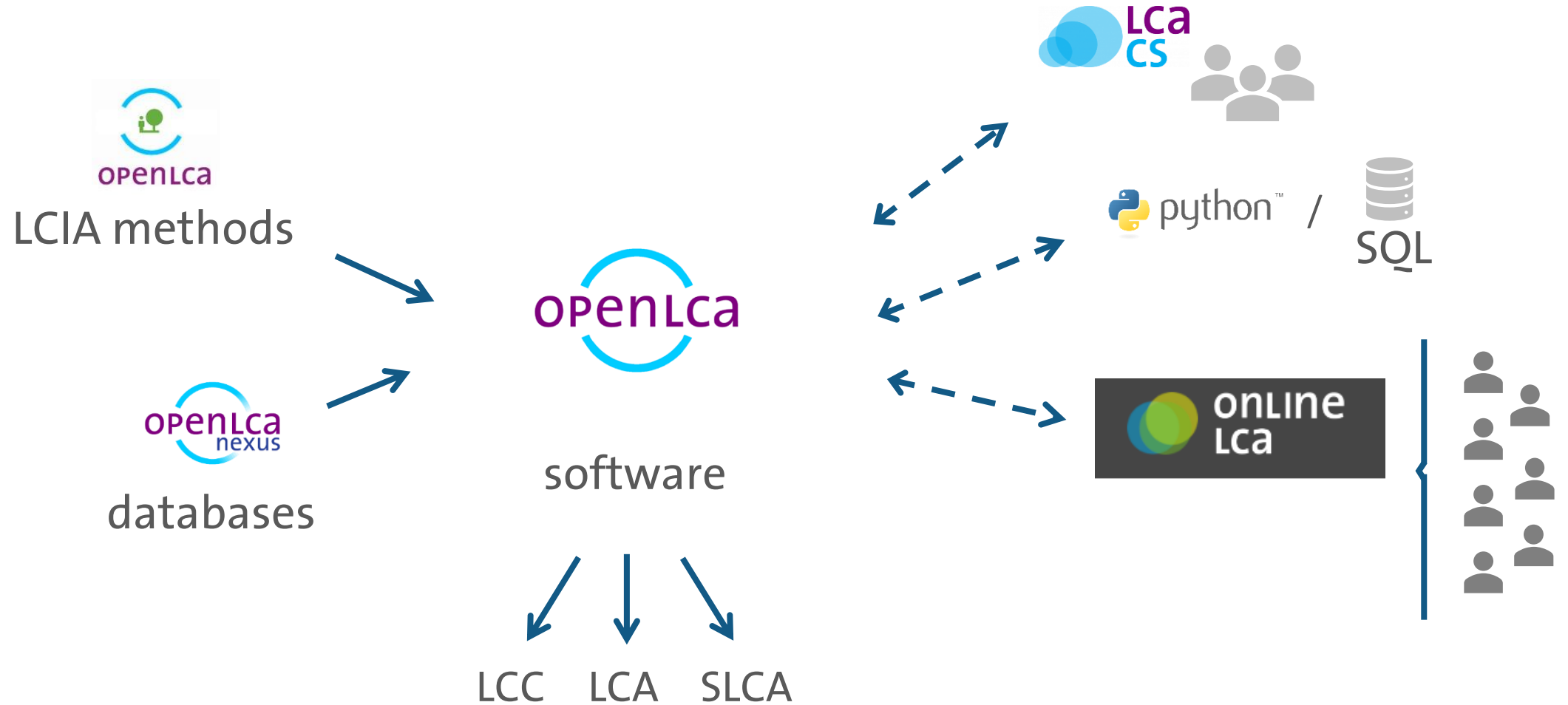


# openLCA

- World's most widely used tool for LCA and sustainability assessment. Thousands of users worldwide.
- Powerful, versatile, transparent, free.
- Developed since 2007, by GreenDelta.
- Supported by US EPA, US DA, JRC, ...
- Widest selection of databases, including ecoinvent, prepared and developed by GreenDelta



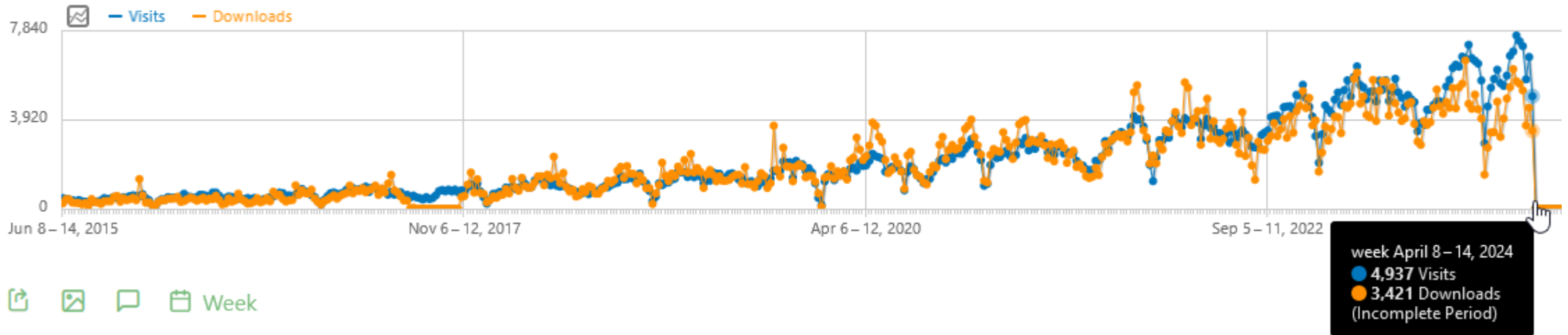
# openLCA, now: a growing ecosystem



# openLCA, now: openLCA Nexus

- > 110,000 Nexus users
- ~ 500 downloads per day

## Visits Over Time

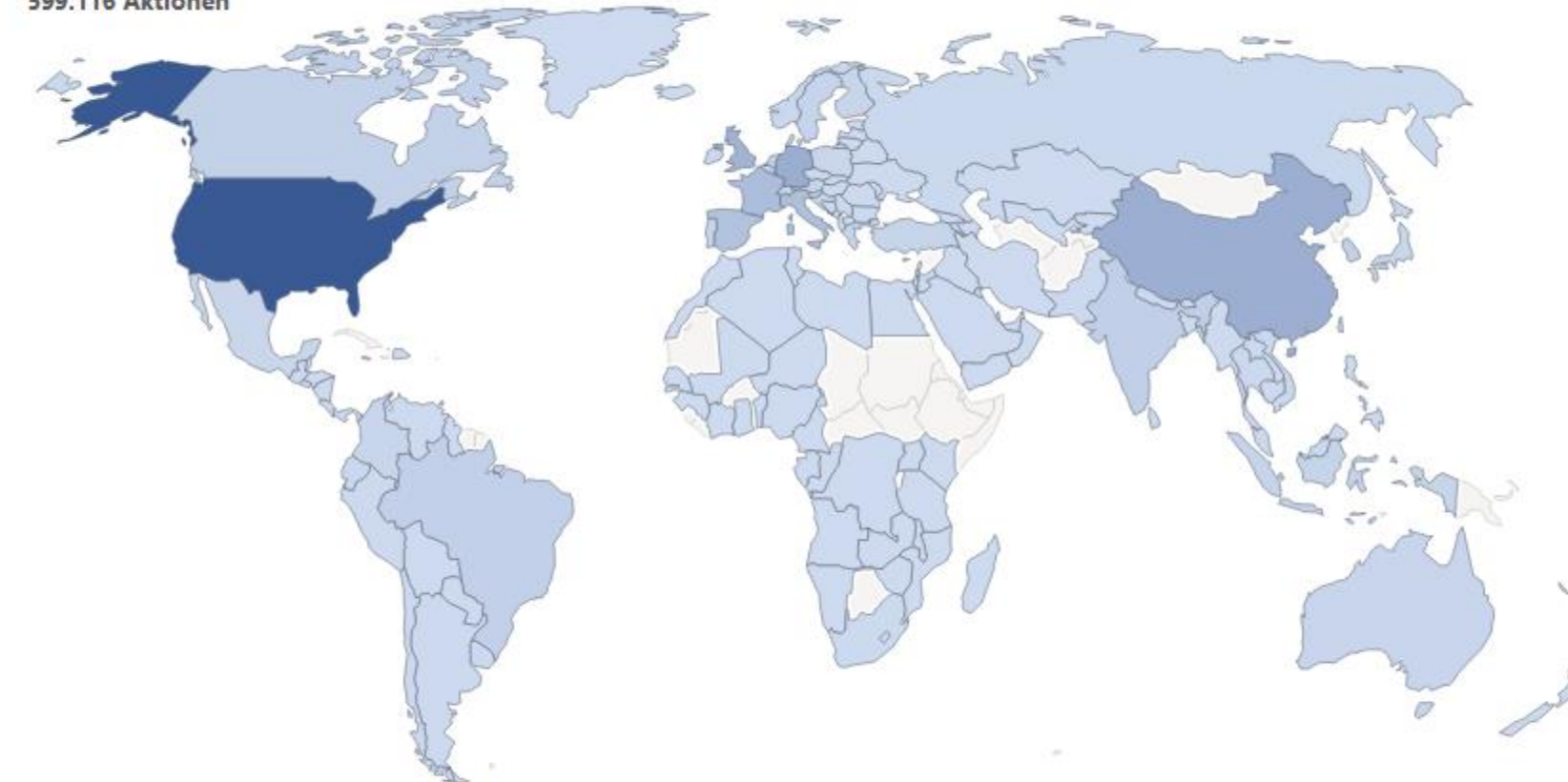




# openLCA, now: openLCA.org, unique actions

Besucherkarte

599.116 Aktionen





# EPDs with openLCA



# EPDs with openLCA

## **1, develop LCA models, compliant with PCR as needed.**

Use openLCA as powerful LCA software for creating the LCA models.

Distinguish LCA model by life cycle stages, as required.

Calculate LCA and other indicator results for the EPD as needed.

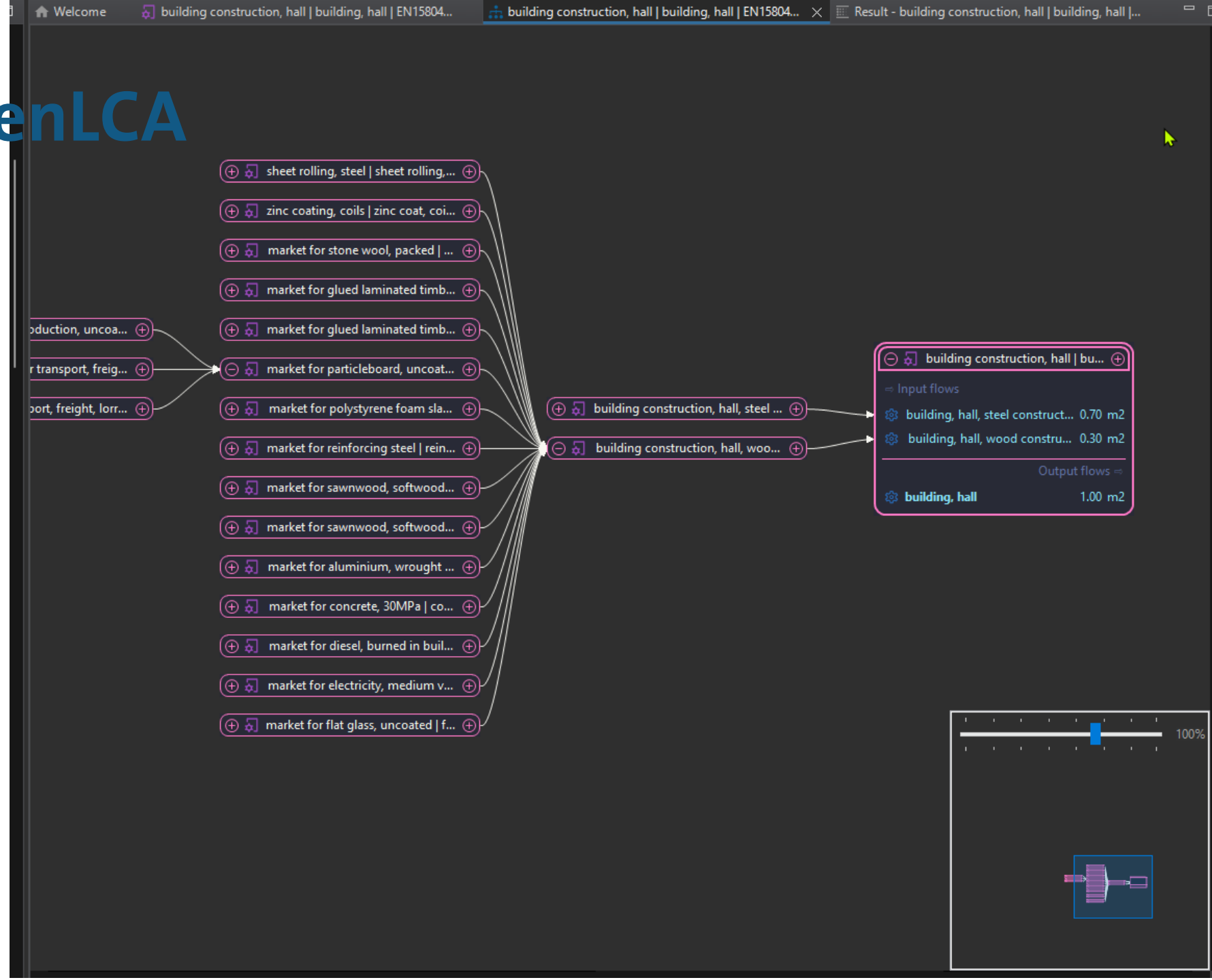
Export in ILCD+EPD format or in JSON-LD format.

Get detailed results, use EN 158094 or other available impact methods (Traci, e.g. in the US).

# EPDs with openLCA

1, develop LCA models, compliant with PCR as needed.

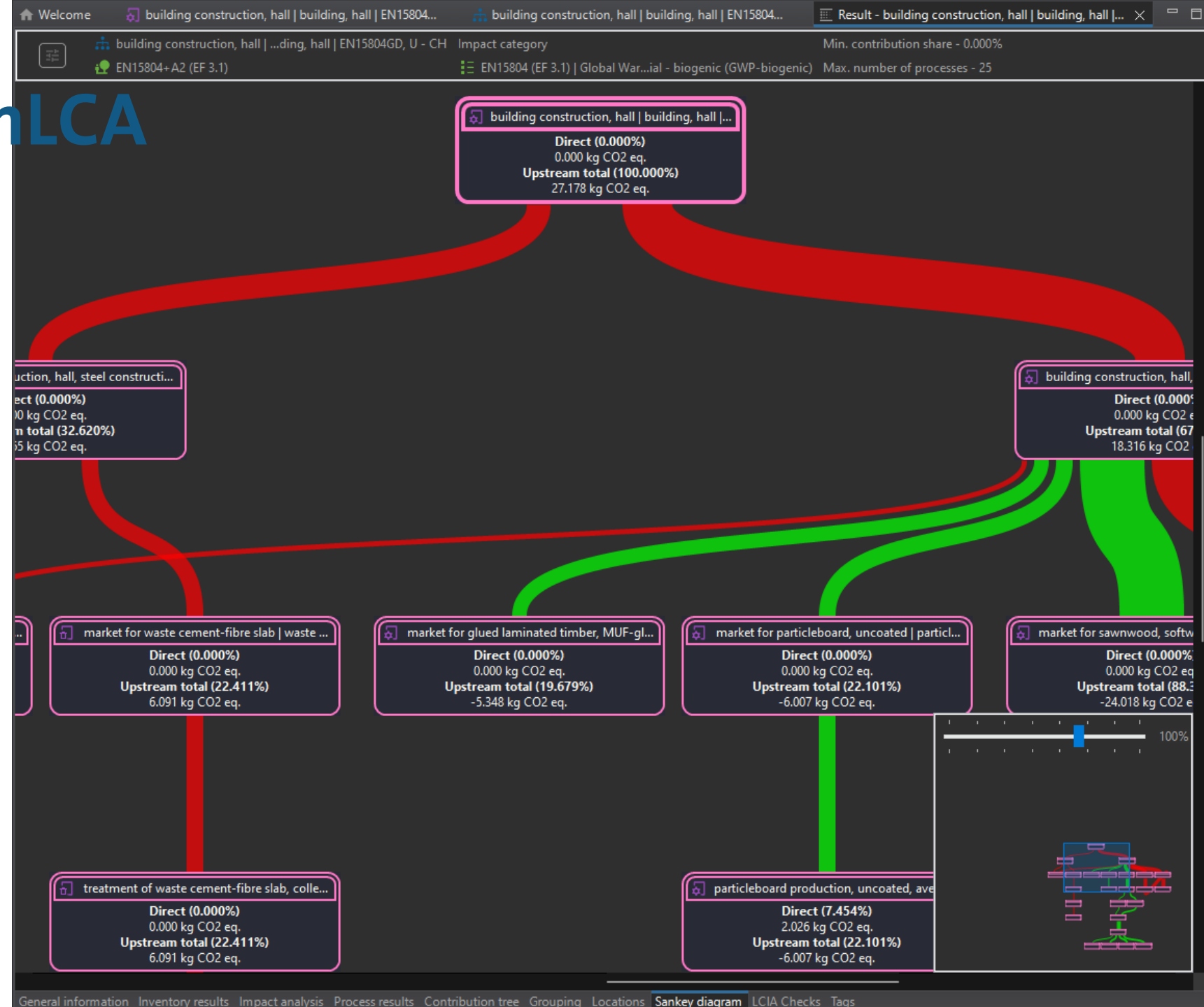
Use openLCA as powerful LCA software for creating the LCA models.



# EPDs with openLCA

1, develop LCA models, compliant with PCR as needed.

Use openLCA as powerful LCA software for creating the LCA models.





# EPDs with openLCA

1, develop LCA models, compliant with PCR as needed

Several useful background databases available

e.g. ecoinvent + EN15804 add-on for modelling according to EN15804 A2.

EN15804 add-on

**en 15804**

the EN15804 add-on for ecoinvent by GreenDelta



## EN15804 add-on

The EN15804 add-on for ecoinvent is a database for Environmental Product Declarations (EPDs) developed by GreenDelta GmbH according to the EN15804 standard. Verified to be compliant with EN15804 (see also documents).



EN 15804 Add-on for ecoinvent in openLCA

Review Report

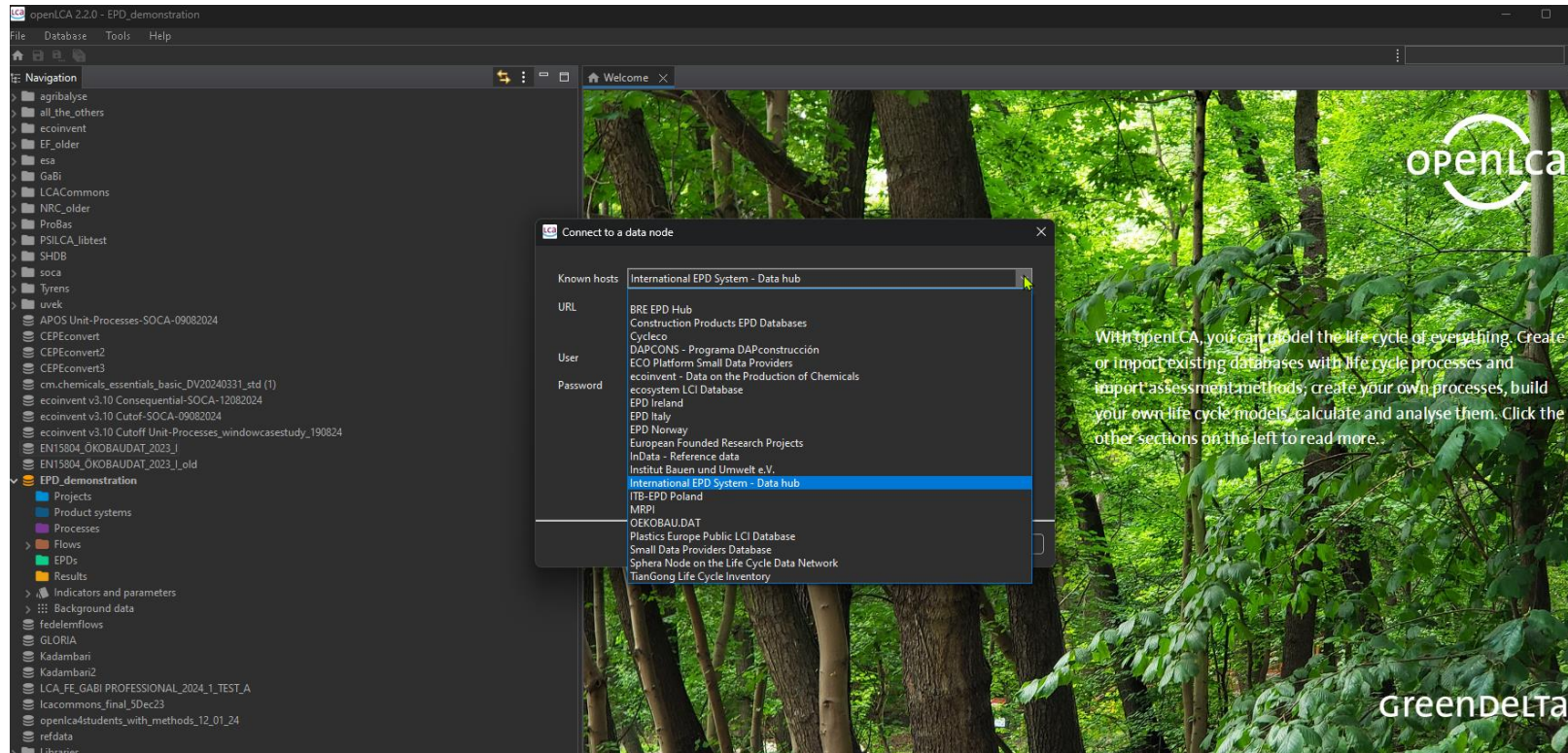
October 2022

# EPDs with openLCA

1, develop LCA models, compliant with PCR as needed

Using EPDs as input into LCA models

a) Import EPDs into openLCA

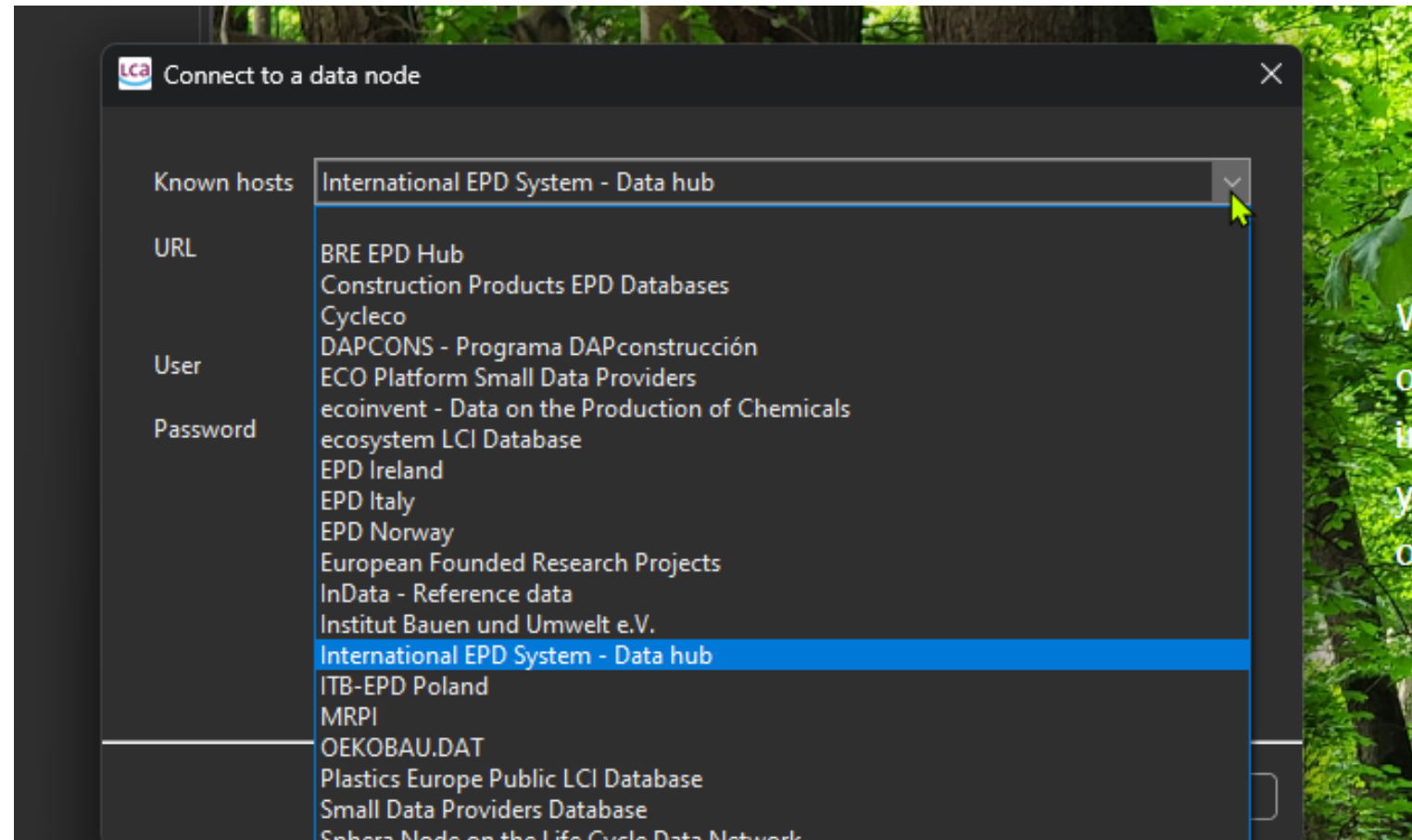


# EPDs with openLCA

1, develop LCA models, compliant with PCR as needed

using EPDs as input into LCA models

a) Import EPDs into openLCA

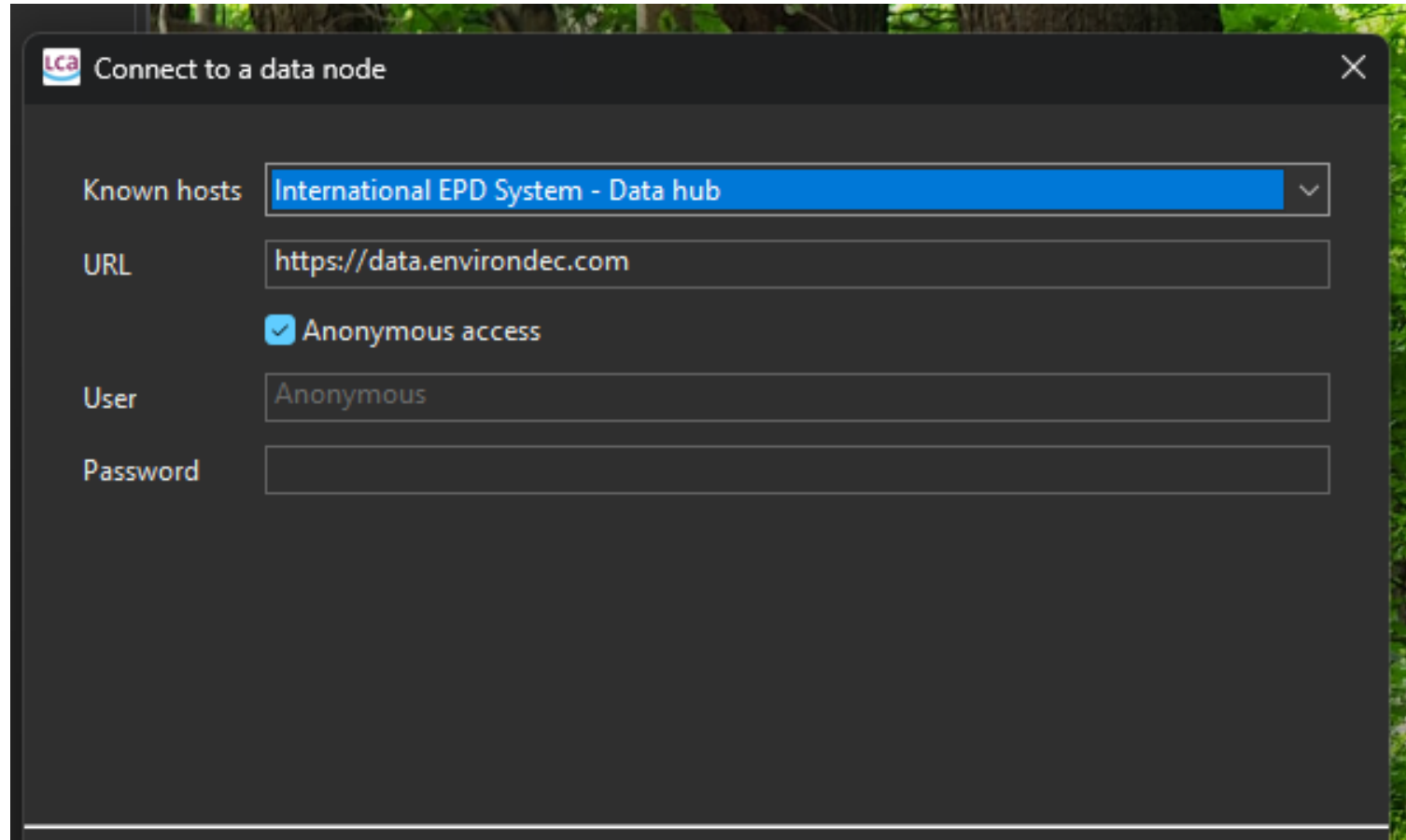


# EPDs with openLCA

1, develop LCA models, compliant with PCR as needed

Using EPDs as input into LCA models

a) Import EPDs into openLCA



The screenshot shows a dark-themed dialog box titled "Connect to a data node" with a close button (X) in the top right corner. The dialog contains the following fields and options:

- Known hosts:** A dropdown menu with "International EPD System - Data hub" selected and highlighted in blue.
- URL:** A text input field containing "https://data.environdec.com".
- Anonymous access:** A checkbox that is checked, with the text "Anonymous access" next to it.
- User:** A text input field containing "Anonymous".
- Password:** An empty text input field.



## Navigation

- > agribalyse
- > all\_the\_others
- > ecoinvent
- > EF\_oldr
- > esa
- > GaBi
- > LCACommons
- > NRC\_oldr
- > ProBas
- > PSILCA\_libtest
- > SHDB
- > soca
- > Tyrens
- > uvek
- APOS Unit-Processes-SOCA-09082024
- CEPEconvert
- CEPEconvert2
- CEPEconvert3
- cm.chemicals\_essentials\_basic\_DV20240331\_std (1)
- ecoinvent v3.10 Consequential-SOCA-12082024
- ecoinvent v3.10 Cutoff-SOCA-09082024
- ecoinvent v3.10 Cutoff Unit-Processes\_windowcasestudy\_190824
- EN15804\_ÖKOBAUDAT\_2023\_I
- EN15804\_ÖKOBAUDAT\_2023\_I\_old
- EPD\_demonstration
  - Projects
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  - Results
  - Indicators and parameters
  - Background data
  - fedelemflows
  - GLORIA
  - Kadambari
  - Kadambari2
  - LCA\_FE\_GABI PROFESSIONAL\_2024\_1\_TEST\_A
  - Icacommons\_final\_5Dec23
  - openlca4students\_with\_methods\_12\_01\_24
  - refdata
  - Libraries
  - Scripts

## Welcome

soda4LCA

## soda4LCA

## Connection

URL Anonymous@https://data.environdec.com/resource

Data stock Undefined / Default

Download

## Data set



Search dataset...

Page: 1

Page size: 50

Search

Name	UUID	Version	Comment
12.5 mm Plasterboard Knauf A-ZERO	daa1778e-be8f-4d2f-b1b3-c32ca2f0...	01.00.001	
12.5 mm Plasterboard Knauf DIAMANT	12602f11-23f2-45b3-aaf0-16cbcb8e...	01.00.001	
12.5 mm Plasterboard Knauf FLEXILASTRA®	bfeb8678-b3cb-4a5b-b8cb-2512b55...	01.00.001	
12.5 mm Plasterboard Knauf GKI	216d9f68-712d-41ba-98de-53406bb...	01.00.001	
12.5 mm Plasterboard Knauf KASA	7b111864-4e13-467e-a9b7-fa57565e...	01.00.001	
12.5 mm, 15 mm Plasterboard Knauf F-ZERO	35995db8-d754-41bb-97ec-dfb010...	01.00.001	
12.5 mm, 15 mm Plasterboard Knauf F-ZERO	e4a1d2e5-f356-4359-814b-5e022038...	01.00.001	
12.5 mm, 15 mm Plasterboard Knauf GKF	e47ca573-b2e4-4e6d-8ad4-d162933...	01.00.001	
12.5 mm, 15 mm Plasterboard Knauf GKF	65634864-221b-4998-afd7-7c8c070b...	01.00.001	
1km track assembly procedure in the Cáceres - Mérida High-Speed Line	34a-4999-4aaf-be4f-05cc1735...	01.00.001	
3M™ Flexible Air Sealing Tape 8067E FAST-F	f479b66e-30cb-4c34-8d1c-2c68c9b...	01.00.001	
3M™ Flexible Air Sealing Tape FAST-D 8069E	45d82498-1401-402f-ab99-45c6f4d8...	01.00.001	
3M™ Flexible Air Sealing Tape FAST-D 8069E	d59f4dfc-ad80-4e0b-b822-129bd27...	01.00.001	
3M™ Flexible Air Sealing Tape Ultra-Conformable 8045	f7b9a37e-01d2-488e-a436-8b145e65...	01.00.001	
4200 Sidewalk and 4400 Broadway	53a96a52-d404-48ba-ae5d-d9c5abf...	01.00.001	
5500 Luxury	cd6f5f18-87fc-4646-9435-3978d915...	01.00.001	
7700 Grimebuster and 7800 Chevrolet	f92be911-7ee2-44d3-ba2b-4a7c763...	01.00.001	
9.5 mm, 12.5 mm, 15 mm Plasterboard Knauf GKB®	9a91b378-1206-40a4-987d-7ee78b2...	01.00.001	
Acaemy and Cordiale	bc9a7708-bc36-4d2f-8f7b-5cefa3e5...	01.00.001	
Acoustic insulation product	a3b402e8-8ece-4c78-a043-861c303f...	01.00.001	
Acoustic membranes M.A.D.	388ec3ee-22b0-45cd-b0ff-068f00e0...	01.00.001	
Acoustic sheet IMPACTODAN	daf458f0-3ca8-45ae-b6ad-b2bf3b52...	03.00.001	
AG Matrix	0c3df782-3bb5-4cbd-b2a1-e335411...	01.00.001	

soda4LCA

Welcome

soda4LCA

soda4LCA

Connection

URL

Anonymous@https://data.environdec.com/resource

Data stock

Undefined / Default

Download

Data set

Environdata

EPDTurkey

Reference\_data

INDATA

Search dataset...

Page: 1

Page size: 50

Search

Name	UUID	Version	Comment
12.5 mm Plasterboard Knauf A-ZERO	daa1778e-be8f-4d2f-b1b3-c32ca2f0...	01.00.001	
12.5 mm Plasterboard Knauf DIAMANT	12602f11-23f2-45b3-aaf0-16cbcb8e...	01.00.001	
12.5 mm Plasterboard Knauf FLEXILASTRA®	bfeb8678-b3cb-4a5b-b8cb-2512b55...	01.00.001	
12.5 mm Plasterboard Knauf GKI	216d9f68-712d-41ba-98de-53406bb...	01.00.001	
12.5 mm Plasterboard Knauf KASA	7b111864-4e13-467e-a9b7-fa57565e...	01.00.001	
12.5 mm, 15 mm Plasterboard Knauf F-ZERO	35995db8-d754-41bb-97ec-dfbb010...	01.00.001	
12.5 mm, 15 mm Plasterboard Knauf F-ZERO	e4a1d2e5-f356-4359-814b-5e022038...	01.00.001	
12.5 mm, 15 mm Plasterboard Knauf GKF	e47ca573-b2e4-4e6d-8ad4-d162933...	01.00.001	
12.5 mm, 15 mm Plasterboard Knauf GKF	65634864-221b-4998-afd7-7c8c070b...	01.00.001	
1km track assembly procedure in the Cáceres - Mérida High-Sp...	3390d34a-4999-4aaf-be4f-05cc1735...	01.00.001	
3M™ Flexible Air Sealing Tape 8067E FAST-F	f479b66e-30cb-4c34-8d1c-2c68c9b...	01.00.001	
3M™ Flexible Air Sealing Tape FAST-D 8069E	45d82498-1401-402f-ab99-45c6f4d8...	01.00.001	
3M™ Flexible Air Sealing Tape FAST-D 8069E	d59f4dfc-ad80-4e0b-b822-129bd27...	01.00.001	
3M™ Flexible Air Sealing Tape Ultra-Conformable 8045	f7b9a37e-01d2-488e-a436-8b145e65...	01.00.001	
4200 Sidewalk and 4400 Broadway	53a96a52-d404-48ba-ae5d-d9c5abf...	01.00.001	
5500 Luxury	cd6f5f18-87fc-4646-9435-3978d915...	01.00.001	
7700 Grimebuster and 7800 Chevrolay	f92be911-7ee2-44d3-ba2b-4a7c763...	01.00.001	
9.5 mm, 12.5 mm, 15 mm Plasterboard Knauf GKB®	9a91b378-1206-40a4-987d-7ee78b2...	01.00.001	
Acaemy and Cordiale	bc9a7708-bc36-4d2f-8f7b-5cefa3e5...	01.00.001	
Acoustic insulation product	a3b402e8-8ece-4c78-a043-861c303f...	01.00.001	
Acoustic membranes M.A.D.	388ec3ee-22b0-45cd-b0ff-068f00e0...	01.00.001	
Acoustic sheet IMPACTODAN	daf458f0-3ca8-45ae-b6ad-b2bf3b52...	03.00.001	
AG Matrix	0c3df782-3bb5-4cbd-b2a1-e335411...	01.00.001	

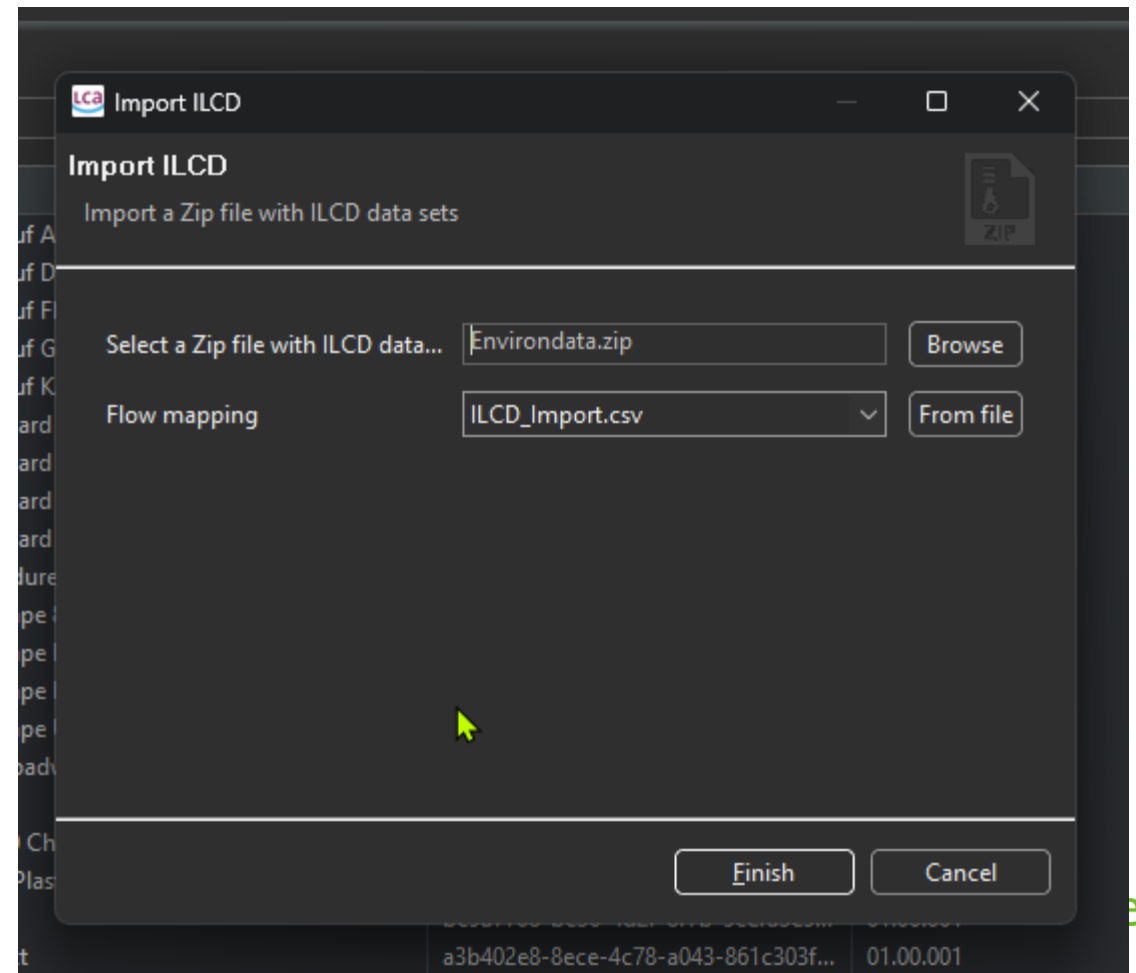
enDELTA

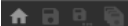
# EPDs with openLCA

1, develop LCA models, compliant with PCR as needed

using EPDs as input into LCA models

a) Import EPDs into openLCA





## Navigation

ecoinvent v3.10 Cutoff Unit-Processes\_windowcasestudy\_190824

## EN15804\_ÖKOBAUDAT\_2023\_I

- Projects
- Product systems
- Processes
  - PS Demo
  - Flows
  - EPDs
    - Beschichtungen
      - Brandschutz
        - Innen- und Außenbeschichtungen
      - Fassadenfarben
        - Dispersion
        - Silikat-Dispersion
        - Silikonharz
      - Grundierungen
      - Innenbeschichtungen
      - Lacke und Lasuren
        - Lacksysteme Holzfassade
        - Lacksysteme Holzfenster
        - Lacksysteme Metall
          - Coating powder IGP-DURA@xal 4201
          - Coating powder IGP-DURA®face, series 58
          - Polyester Powder Coating
          - Powder coating (outdoor use, white), 1 kg
          - Powder coating (outdoor use, white), 1 kg
          - Solvent based lacquer, white, white
          - Solvent based lacquer, white, white
          - Water based lacquer, white, water based
          - Water based lacquer, white, water based
      - Parkettlack
      - Reaktionsharze
    - Dämmstoffe
    - End of Life
      - Generisch
        - Bauschutt
        - Gebäudetechnik
        - Hausmüll
        - Holz
        - Kunststoffe
        - Metalle
      - Gebäudetechnik
      - Holz
      - Komponenten von Fenstern und Vorhangfassaden
      - Komposite
      - Kunststoffe
      - Metalle
      - Mineralische Baustoffe
      - Sonstige
- Results
- Indicators and parameters
- Background data
- EN15804\_ÖKOBAUDAT\_2023 | old

Welcome

soda4LCA

Polyester Powder Coating X

## General information - Polyester Powder Coating

## General information

Name Polyester Powder Coating

Category Beschichtungen/Lacke und Lasuren/Lacksysteme Metall

Description This Environmental Product Declaration declares a representative weatherproof polyester powder coating. The powder coating under review is an organic-based, thermally-hardening, duroplastic coating material which complies with the state of the art. The powder coating comprises polyester resin with the corresponding curing agent, additives, suitable filler and weather-resistant pigments. This Declaration refers to an average composition which is standard within the sector.

Version 00.04.000 Last change 2017-02-21 14:02:15 UUID a770f4d7-3b0e-49d5-9325-1feb51710b21

Tags Add a tag X DIN EN 15804 X ISO 14025

Upload as draft to EC3

## Declared product

Flow 1 kg Polyester-Pulverlack X

Amount 1.0 kg ± 1.0 kg

## References

Manufacturer VdL - Verband der deutschen Lack- und Druckfarbenindustrie e. V. X

Program operator Institut Bauen und Umwelt e. V. X

PCR - none - X

Verifier Institut Bauen und Umwelt e. V. X

URN ilcd:epd:a770f4d7-3b0e-49d5-9325-1feb51710b21 X

## Modules

Module	Result	LCIA method	Result multiplier	Reference flow
A1-A3	Polyester Powder Coating - A1-A3	EN15804+A1 (CML 4.8)	1.0	1.00 kg - 1 kg Polyester-Pulverlack



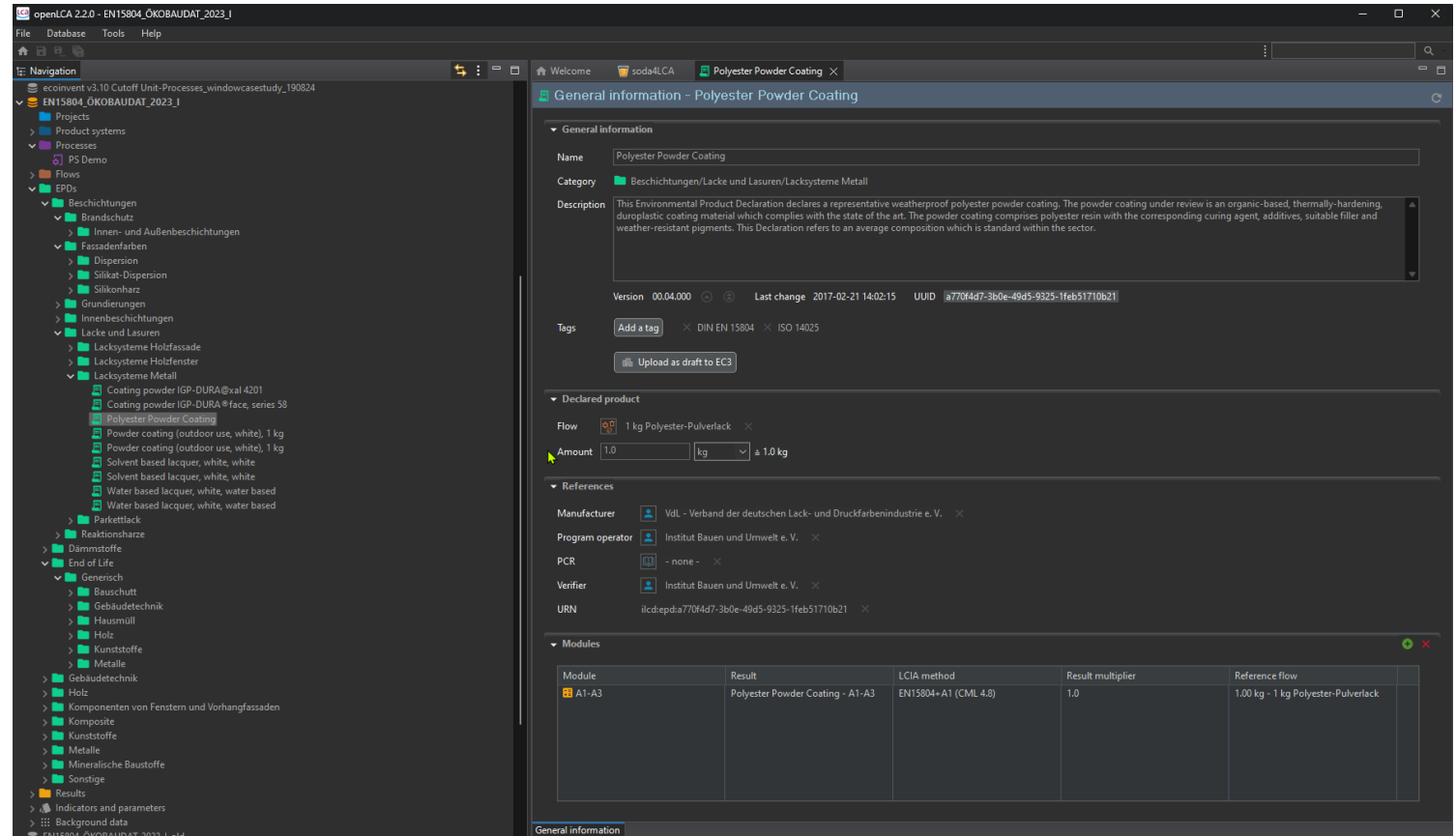
# EPDs with openLCA

1, develop LCA models,  
compliant with PCR as  
needed

using EPDs as input into LCA  
models

a) Import EPDs into  
openLCA

→ Very powerful, lots of  
EPDs available, specific  
data



openLCA 2.2.0 - EN15804\_ÖKOBAUDAT\_2023\_I

FileDatabaseToolsHelp

Navigation

ecoinvent v3.10 Cutoff Unit-Processes\_windowcasestudy\_190824

EN15804\_ÖKOBAUDAT\_2023\_I

Projects

Product systems

Processes

PS Demo

Flows

EPDs

Beschichtungen

Brandschutz

Innen- und Außenbeschichtungen

Fassadenfarben

Dispersion

Silikat-Dispersion

Silikonharz

Grundierungen

Innenbeschichtungen

Lacke und Lasuren

Lacksysteme Holzfassade

Lacksysteme Holzfenster

Lacksysteme Metall

Coating powder IGP-DURA@xal 4201

Coating powder IGP-DURA®face, series 58

Polyester Powder Coating

Powder coating (outdoor use, white), 1 kg

Powder coating (outdoor use, white), 1 kg

Solvent based lacquer, white, white

Solvent based lacquer, white, white

Water based lacquer, white, water based

Water based lacquer, white, water based

Parkettlack

Reaktionsharze

Dämmstoffe

End of Life

Generisch

Bauschutt

Gebäudetechnik

Hausmüll

Holz

Kunststoffe

Metalle

Gebäudetechnik

Holz

Komponenten von Fenstern und Vorhangfassaden

Komposite

Kunststoffe

Metalle

Mineralische Baustoffe

Sonstige

Results

Indicators and parameters

Background data

EN15804 ÖKOBAUDAT 2023\_I old

Welcome

soda4LCA

Polyester Powder Coating

General information - Polyester Powder Coating

General information

Name

Polyester Powder Coating

Category

Beschichtungen/Lacke und Lasuren/Lacksysteme Metall

Description

This Environmental Product Declaration declares a representative weatherproof polyester powder coating. The powder coating under review is an organic-based, thermally-hardening, duroplastic coating material which complies with the state of the art. The powder coating comprises polyester resin with the corresponding curing agent, additives, suitable filler and weather-resistant pigments. This Declaration refers to an average composition which is standard within the sector.

Version

00.04.000

Last change

2017-02-21 14:02:15

UUID

a770f4d7-3b0e-49d5-9325-1feb51710b21

Tags

Add a tag

DIN EN 15804

ISO 14025

Upload as draft to EC3

Declared product

Flow

1 kg Polyester-Pulverlack

Amount

1.0

kg

± 1.0 kg

References

Manufacturer

VdL - Verband der deutschen Lack- und Druckfarbenindustrie e. V.

Program operator

Institut Bauen und Umwelt e. V.

PCR

- none -

Verifizier

Institut Bauen und Umwelt e. V.

URN

ilcd:epd:a770f4d7-3b0e-49d5-9325-1feb51710b21

Modules

Module	Result	LCIA method	Result multiplier	Reference flow
A1-A3	Polyester Powder Coating - A1-A3	EN15804+A1 (CML 4.8)	1.0	1.00 kg - 1 kg Polyester-Pulverlack

General information

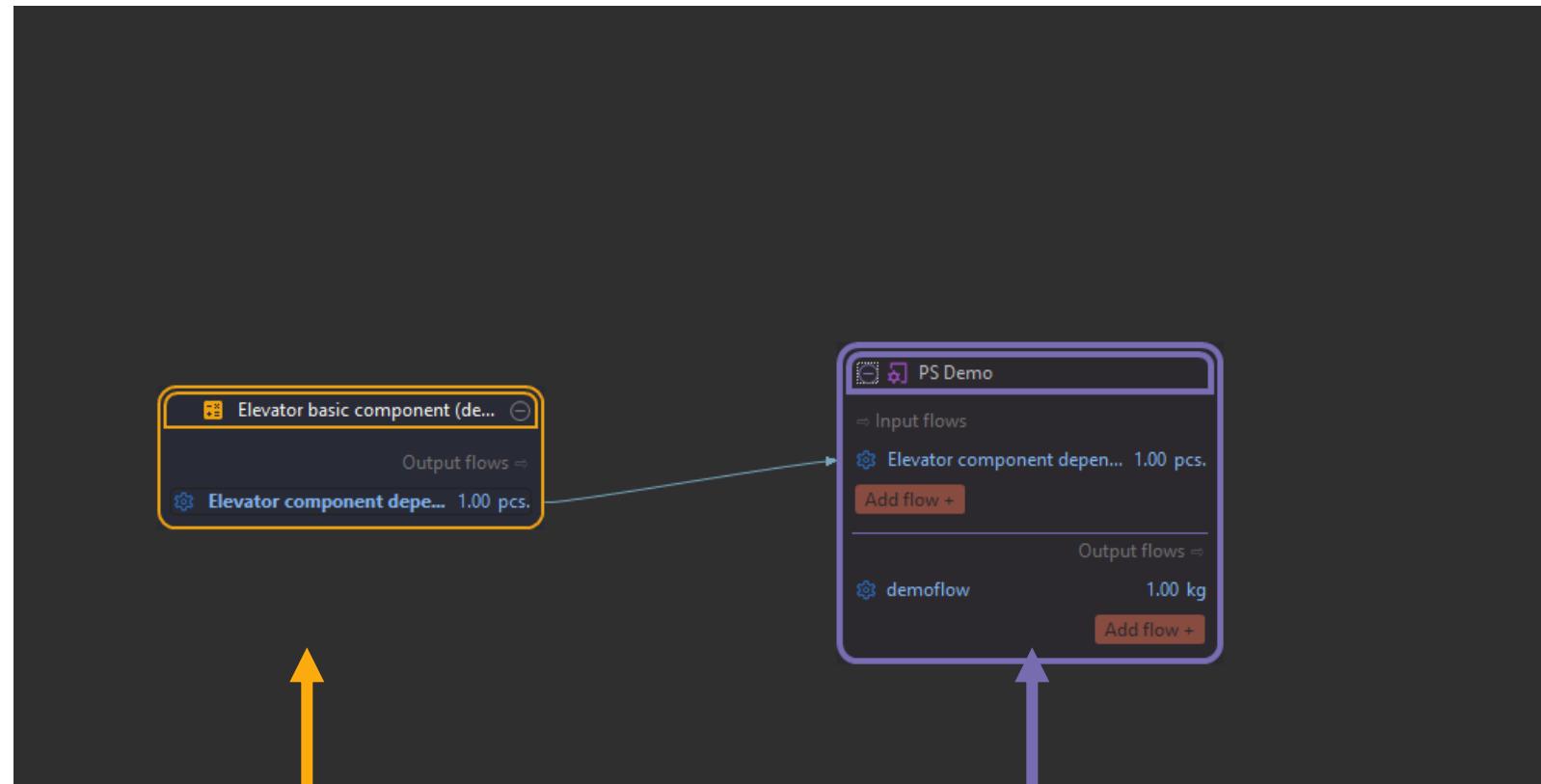
# EPDs with openLCA

1, develop LCA models,  
compliant with PCR as  
needed

using EPDs as input into LCA  
models

b) Use EPDs in own models

→ Allows to make specific  
models with background  
data (select the producer for  
the product that you use)



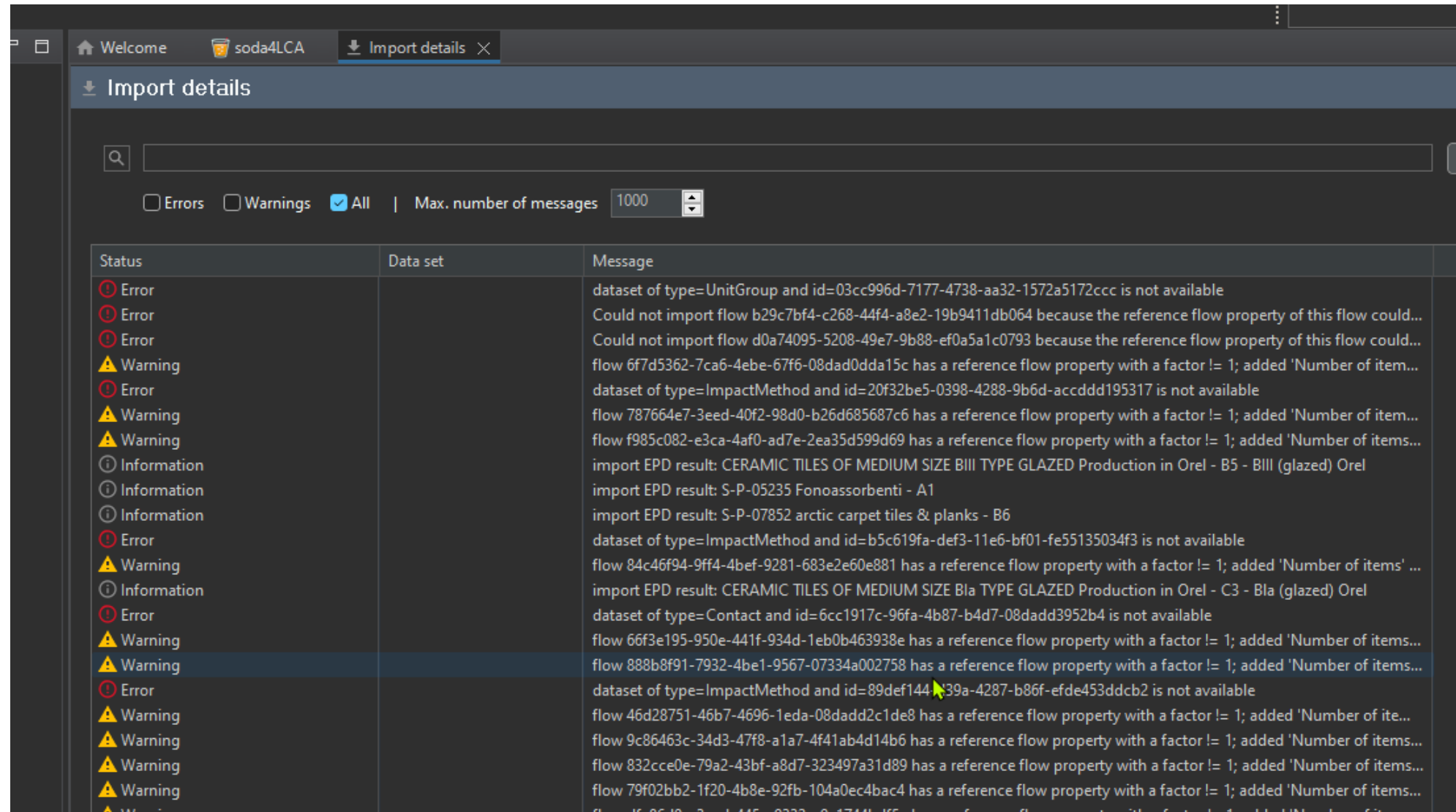
EPD result

LCA process

greenDELTA

# EPDs with openLCA

(however,  
some issues:  
openLCA is  
the first tool  
to import  
these EPDs  
-> this has  
not been  
done before,  
many  
existing  
digital EPDs  
incorrect,  
technically)



The screenshot shows the 'Import details' window in openLCA. It features a search bar, filters for Errors, Warnings, and All (selected), and a dropdown for the maximum number of messages (set to 1000). Below is a table of import messages.

Status	Data set	Message
Error		dataset of type=UnitGroup and id=03cc996d-7177-4738-aa32-1572a5172ccc is not available
Error		Could not import flow b29c7bf4-c268-44f4-a8e2-19b9411db064 because the reference flow property of this flow could...
Error		Could not import flow d0a74095-5208-49e7-9b88-ef0a5a1c0793 because the reference flow property of this flow could...
Warning		flow 6f7d5362-7ca6-4ebe-67f6-08dad0dda15c has a reference flow property with a factor != 1; added 'Number of item...
Error		dataset of type=ImpactMethod and id=20f32be5-0398-4288-9b6d-accddd195317 is not available
Warning		flow 787664e7-3eed-40f2-98d0-b26d685687c6 has a reference flow property with a factor != 1; added 'Number of item...
Warning		flow f985c082-e3ca-4af0-ad7e-2ea35d599d69 has a reference flow property with a factor != 1; added 'Number of items...
Information		import EPD result: CERAMIC TILES OF MEDIUM SIZE BIII TYPE GLAZED Production in Orel - B5 - BIII (glazed) Orel
Information		import EPD result: S-P-05235 Fonoassorbenti - A1
Information		import EPD result: S-P-07852 arctic carpet tiles & planks - B6
Error		dataset of type=ImpactMethod and id=b5c619fa-def3-11e6-bf01-fe55135034f3 is not available
Warning		flow 84c46f94-9ff4-4bef-9281-683e2e60e881 has a reference flow property with a factor != 1; added 'Number of items' ...
Information		import EPD result: CERAMIC TILES OF MEDIUM SIZE BIa TYPE GLAZED Production in Orel - C3 - BIa (glazed) Orel
Error		dataset of type=Contact and id=6cc1917c-96fa-4b87-b4d7-08dadd3952b4 is not available
Warning		flow 66f3e195-950e-441f-934d-1eb0b463938e has a reference flow property with a factor != 1; added 'Number of items...
Warning		flow 888b8f91-7932-4be1-9567-07334a002758 has a reference flow property with a factor != 1; added 'Number of items...
Error		dataset of type=ImpactMethod and id=89def144-339a-4287-b86f-efde453ddcb2 is not available
Warning		flow 46d28751-46b7-4696-1eda-08dadd2c1de8 has a reference flow property with a factor != 1; added 'Number of ite...
Warning		flow 9c86463c-34d3-47f8-a1a7-4f41ab4d14b6 has a reference flow property with a factor != 1; added 'Number of items...
Warning		flow 832cce0e-79a2-43bf-a8d7-323497a31d89 has a reference flow property with a factor != 1; added 'Number of items...
Warning		flow 79f02bb2-1f20-4b8e-92fb-104a0ec4bac4 has a reference flow property with a factor != 1; added 'Number of items...

# EPDs with openLCA

## 2, use openLCA in EPD verification

openLCA allows export and import of entire LCA models, software is free -> entire models can be shared in verification.

This increases quality of the verification, verifier can check the entirety of the model, not only what is documented in the background report.

→ This is already quite broadly used.



# EPDs with openLCA, next steps

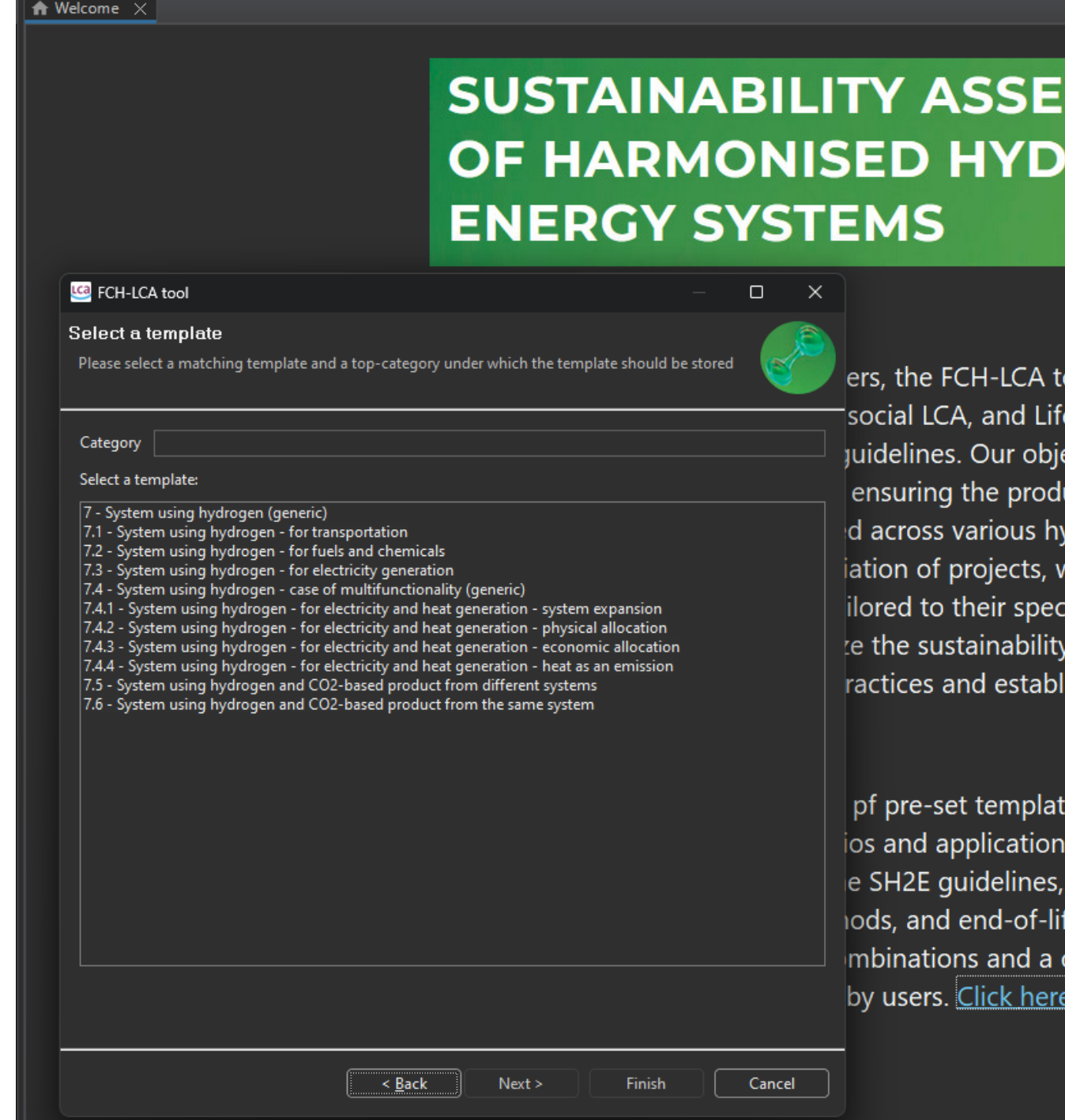


# EPDs with openLCA, next steps

## Templates

Developed by GreenDelta in the course of the EU Horizon research project for sustainability assessment of hydrogen (SH2E), templates in openLCA can help to steer modelling.

-> define what is permitted, setting of system boundaries, impact methods, ...



# EPDs with openLCA, next steps



## LCA Collaboration Server

A unique tool for sustainability data management, developed by GreenDelta for the US LCA Digital Commons since ~ 8 years.

-> Similar to a software code repository, trace changes in LCA data (processes, models, LCIA methods)

Version 2 built using git, most widely used software code management software.

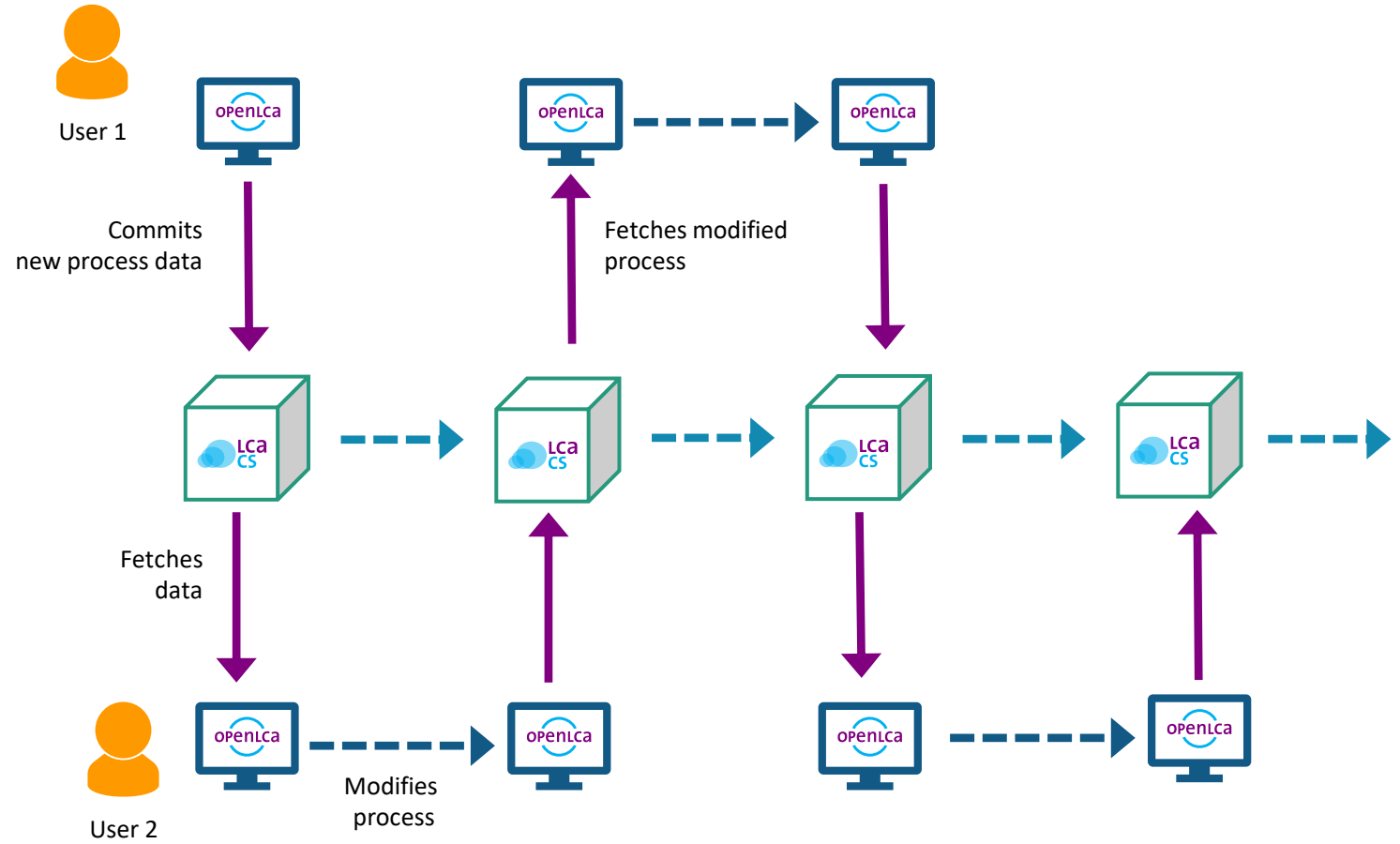
Public websites e.g. [lcamonitors.org](https://lcamonitors.org).

# EPDs with openLCA, next steps

LCA Collaboration  
Server,

Use cases

1, co-development of  
LCA models

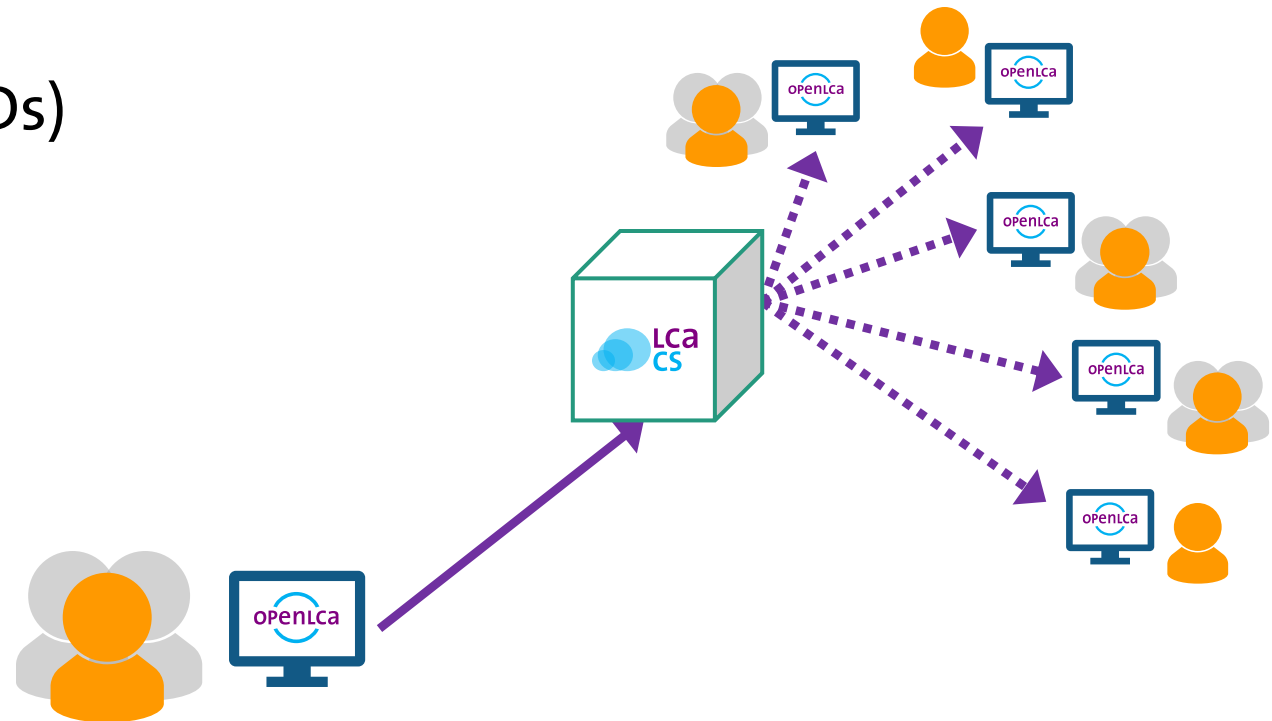


# EPDs with openLCA, next steps

LCA Collaboration Server,

Use cases

2, Distribution of models (and EPDs)



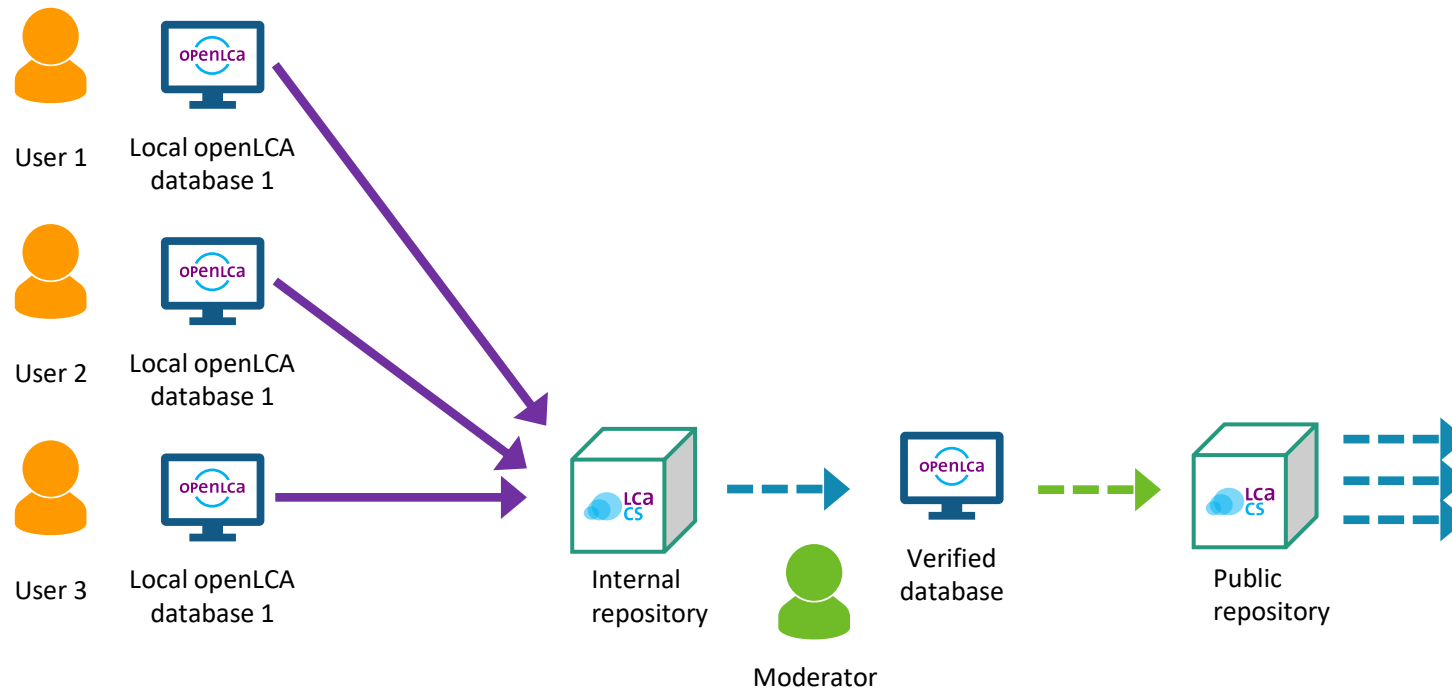


# EPDs with openLCA, next steps

LCA Collaboration Server,

Use cases

3, moderation and review (and publication)



# Conclusions



# Conclusions

- **openLCA is a powerful, user-friendly and broadly used tool for creating LCA models and EPDs**
- **There are more and more useful background data available specifically for EPDs (EN15804 add-ons, EPDs) that can be used in openLCA**
- **There are quite some interesting potential next steps for further improving EPD creation, EPD quality, and EPD distribution**



**Thank you very much!**

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