

# The LCI Workbench

Data CC-BY 4.0

Code Apache 2.0

Firefly AGPL-3.0

Open, auditable LCI data for food — built once, used by everyone.

Eaternity AG · Zürich · [gitlab.com/eos-lci/lci-workbench-0d71e7.gitlab.io](https://gitlab.com/eos-lci/lci-workbench-0d71e7.gitlab.io)

## What is the LCI Workbench?

An open platform for building transparent, verifiable food LCA data — organised around three pillars.

**PILLAR 1**

### Tributary architecture

**41**

tributary projects

Small Python packages, each owning one slice of the food supply chain — fertiliser, packaging, transport, livestock, soil carbon (RoThC, ICBM), nitrogen emissions, rice CH, land-use change, fruit, dairy, coffee, processing, aquaculture and more.

Each tributary builds its layer from public data, IPCC emission models, and peer-reviewed literature. New science enters by adding a tributary — never by patching the platform.

**PILLAR 2**

### 8-source biosphere alignment

**8**

independent registries triangulated

biosphere3, BAFU/UVEK, EF 3.1 (JRC), GLAD (UN-SETAC), D-D-S (Départ de Sentier), FEDEFL (US EPA), HESTIA, and Agribalyse — unified into one mapping that resolves naming differences, compartment variants, and characterization-factor discrepancies.

Result: **zero CF conflicts** and all **16 EF 3.1 impact categories** available for every product.

**PILLAR 3**

### Autonomous quality pipeline

**2,300+**

scientific papers transcribed

**Investigate** → **fix** → **verify** → **resolve** runs daily. Each product is cross-checked against published studies, third-party databases, and any other source of value we can find; GWP changes are tracked and validated automatically.

Of those papers, **1,620 are verified** and feed parameters back into the tributaries. The full audit trail is published with every release.

## KEY NUMBERS — WHAT THE PLATFORM TRACKS TODAY

**2,331**

EDB food products

**14,800**

Agribalyse products

**16 / 16**

EF 3.1 impact categories enabled

**111,151**

biosphere flows tracked across 8 registries

**90.7%**

biosphere3 flows mapped (4,350 / 4,795)

**100%**

of CF-bearing flows mapped — unmapped flows have no CF in any LCIA method

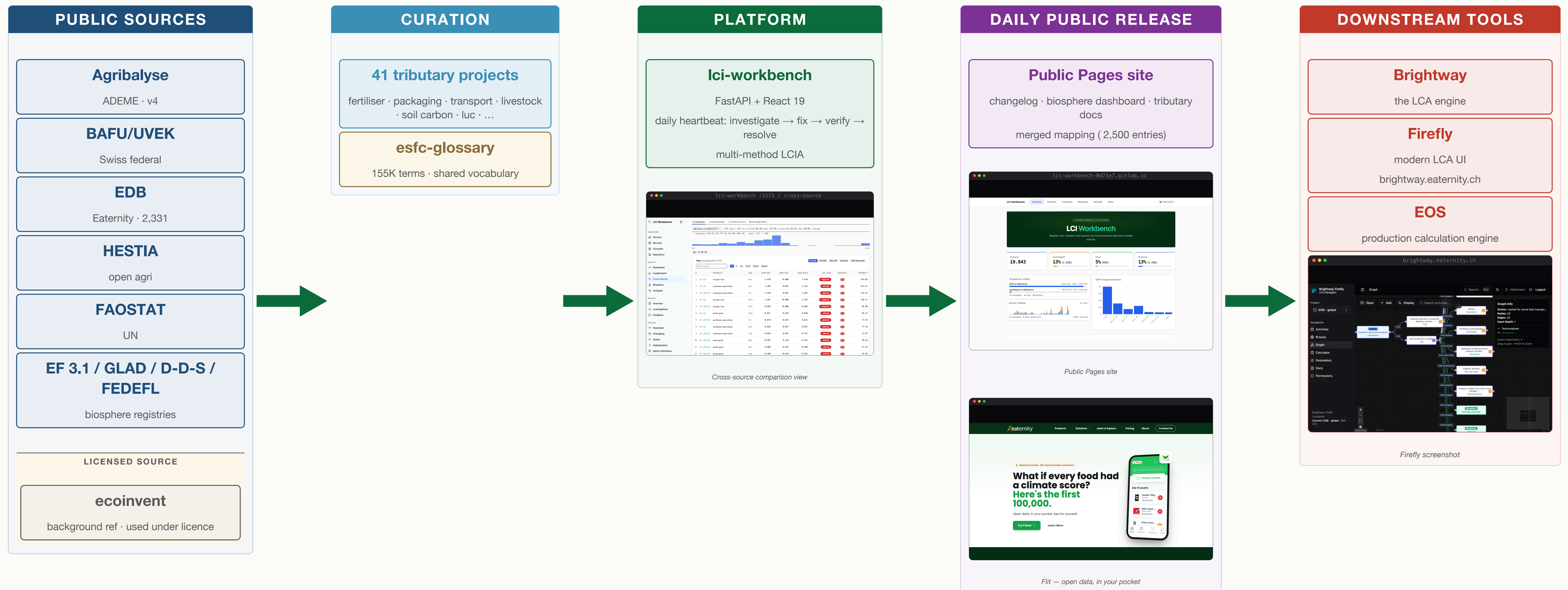
**99.7%**

sediment annotations on the merged mapping (3,051 / 3,059 entries)

**0**

characterization-factor conflicts

## HOW THE DATA MOVES



## THE 41 TRIBUTARY PROJECTS — WHAT'S IN THE CATALOGUE TODAY

Data-providers wrap a public source; models compute emissions for one process layer.

Data-providers (wrap a public source)

- agri-data
- geodata
- bafu-catalog
- ecoinvent-catalog
- location
- origin
- recipe

Model tributaries (compute emissions)

- fertiliser
- pesticide
- packaging
- transport
- waste-treatment
- market
- allocation
- luc
- livestock
- rothc
- icbm
- indigo-n
- rice-ch4
- fruit
- coffee
- dairy
- fermentation
- food-processing
- food-loss
- greenhouse
- fishing
- aquaculture
- oilpalm
- cotton
- algae
- metals
- fuel-combustion
- ecotransit
- biodiversity
- crop-residue-burning
- phosphorus
- agri-integration
- ipcc-tier1-agri
- ...

### Same contract — and parameterizable.

Each repo carries tributary.toml, a results/ mapping, sediment annotations, and pytest. Most tributaries accept **spatio-temporal parameters** — --country CH, --region RER, --year 2022, --delivery-type regional — so the same model can be re-run for any geography or reference year. The merged result downstream is ecoinvent\_to\_bafu\_mapping\_final.json (2,500 entries).

## SEDIMENT — THE DURABLE IDENTITY LAYER

UUIDs change with every database release. **Sediment** doesn't — it pins meaning to typed glossary pointers, so downstream tools keep working across versions.

```

    {"ns":"foodex2", "id":"A001K"} → foodex2: "Coconut, fresh"
    {"ns":"hestia", "id":"coconutFresh"} → hestia: "Coconut fresh"
    {"ns":"gadm", "id":"CRI.1.3"} → gadm: "Limón, Costa Rica"
  
```

Each term is a pointer into the 155K-term shared glossary. Coverage today: 99.7%.

## WHERE THE DATA GOES — DOWNSTREAM TOOLS

**Brightway · Firefly** [brightway.eaternity.ch](https://brightway.eaternity.ch)

**Firefly** is the modern interface for LCA, powered by Brightway2. Search 18,000+ activities, calculate impacts under 10+ LCIA methods, visualize supply chains. Web + native desktop apps.

**EOS — production engine** **INCOME STREAM**

Eaternity's open environmental operating system runs the workbench's published data at production scale. Tributaries become **Gap-Filling Modules** — independently scheduled, cached, orchestrated. The commercial offering on top of EOS funds the open curation work upstream.

## OPEN BY DEFAULT — DAILY PUBLIC RELEASE, EVERY FIX ON THE PUBLIC RECORD

**CC-BY 4.0** · Data — comparison results, quality metrics, biosphere alignment.

**Apache 2.0** · Code — workbench platform, comparison engine, biosphere alignment tools.

**AGPL-3.0** · Code — Firefly practitioner interface, strong copyleft.

