Scaling EPD Production with Digital Tools

How OpenEPD can be the tool

September 13, 2025

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WAP

EPD®
THE INTERNATIONAL EPD SYSTEM

What are digital EPDs?

Data structure intended for machine readability

OZINGA

EPD

ENVIRONMENTAL PRODUCT DECLARATION

READY MIX CONCRETE PRODUCED BY:OZINGA

FACILITY: Chicago Chinatown
STRENGTH: 6000 psi @ 28 days
MIX NAME: 4715X

IMPACT INDICATOR		PER YD3	PER M3
Global Warming Potential	kg CO_2e	445.81	583.10
Ozone Depletion	kg CFC11e	8.58E-0	1.12E-0
Acidification	kg SO2e	4.19	5.48
Eutrophication	kg NE	0.58	0.76
SFP (Smog)	kg O3e	115.13	150.58
Non-renew. energy	MJ, NCV	3883.82	5079.85

GENERAL INFORMATION	
Declared Product	Ready-mixed concrete produced by Ozinga
Date of Issue	June 18, 2025
Period of Validity	August 13th, 2025
EPD Holder	Ozinga Bros., Inc. 19001 Old LaGrange Road Mokena, IL 60448 www.ozinga.com
Program Operator	ASTM International 100 Bar Harbor Drive West Conshohocken, PA 19428-2959, USA
LCA and EPD Developer	WAP Sustainability Consulting 1701 Market Street Chattanooga, TN 37408
Core PCR	ISO 21930:2017 Sustainability in Building Construction - Environmental Declaration of Building Products
Sub-category PCR	NSF International Product Category Rule (PCR) for Concrete Version 2.3 (February 2024), Reviewed by Thomas P. Gloria, Bill Stough, and Michael Overcash.
Independent LCA Reviewer and EPD Verifier	Independent verification of the declaration and data, according to ISO 21930:2017 and ISO 14025:2006 ☐ Internal ☒ External Thomas P. Gloria, Ph.D., Industrial Ecology Consultants
For Additional Explanatory Material	Manufacture Representative: Ryan Cialdella (ryancialdella@ozinga.com) Software Tool: Theta by WAP Sustainability Consulting V.1.0.

The declared product meets the following product specifications:

- ACI 211: Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
- ACI 318: Building Code Requirements for Structural Concrete.
- ASTM C94 Standard Specification for Ready-Mixed Concrete.
- CSI Masterformat Division 03-30-00: Cast-in-Place Concrete.
- UNSPSC Code 30111500: Ready Mix

Disclaimer:
EPDS are comparable only if they comply with this document, use the same sub-category PCR where applicable, include all relevant information modules and are based on equivalent scenarios with respect to the context of construction works.

This EPD was calculated using industry average cement data. Cement LCA impacts can vary depending upon manufacturing process, efficiency and fuel source by as much as 50% for some environmental impact categories. Cement accounts for as much as 90% of the impacts of the concrete mixes included in this EPD and thus manufacturer specific cement impacts could result in variation of as much as 45%.

OZINGA | ENVIRONMENTAL PRODUCT DECLARATION

OPENEPD JSON


```
▸ ext: Object {"ec3":{"uaGWP_a1a2a3_traci21":638.2491703949438,"uaGWP_a1a2a3_ar5":640.1805022308292,"category":"C
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  openepd_version: "0.1"
  id: "EC3PG80W"
  date_of_issue: "2025-06-18T00:00:00+00:00"
  valid_until: "2029-06-27T00:00:00+00:00"
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  product_image: null
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▸ includes: Array[0] []
▸ ec3: Object {"uaGWP_a1a2a3_traci21":638.2491703949438,"uaGWP_a1a2a3_ar5":640.1805022308292,"category":"Concrete
```


DOWNLOAD

SCRATCH THAT!

Let’s start with a story instead.

The Story starts in 2021

Acquire LCA and EPD Software Companies

Data Structure #1

Data Structure #2

?

Logic would tell us the data structures would be similar, built from the same ISO standards, on PCRs, for LCAs & EPDs….

but they were really different.
Leading us to ask, which one was “right”

The story complicated itself.

Data Structure #1

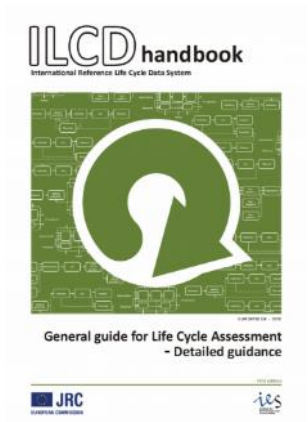
Data Structure #2

Customers of Coldsteam and regulators started to show favor toward the EC3 database, meaning digital EPDs needed to be created to align with the EC3 data structure.

The story complicated itself.

Data Structure #1

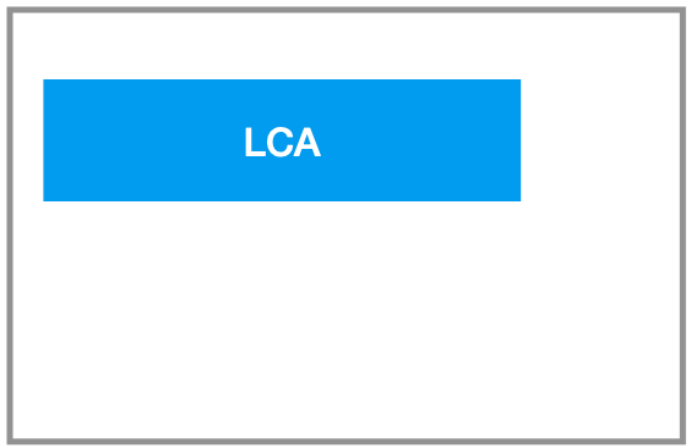
Data Structure #2



But then we had Customers of Trisight starting to show favor toward the ILCD+EPD format.

Which led to questioning what is different between EC3's openEPD and ILCD+EPD?

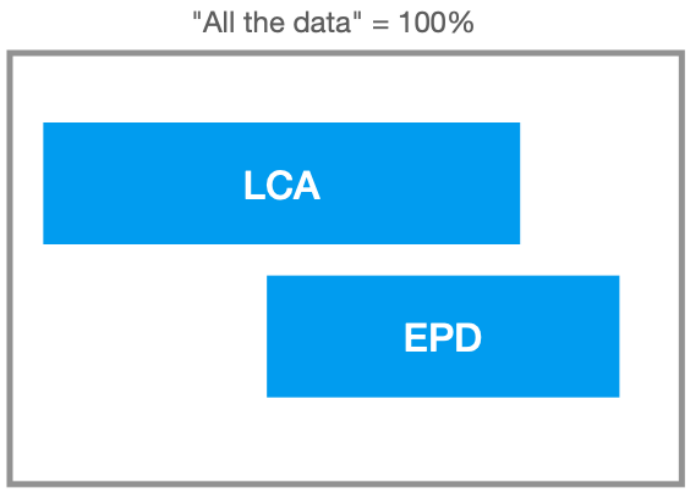
4 Data Structures and Counting.



0%

= A+B+C+D

100%



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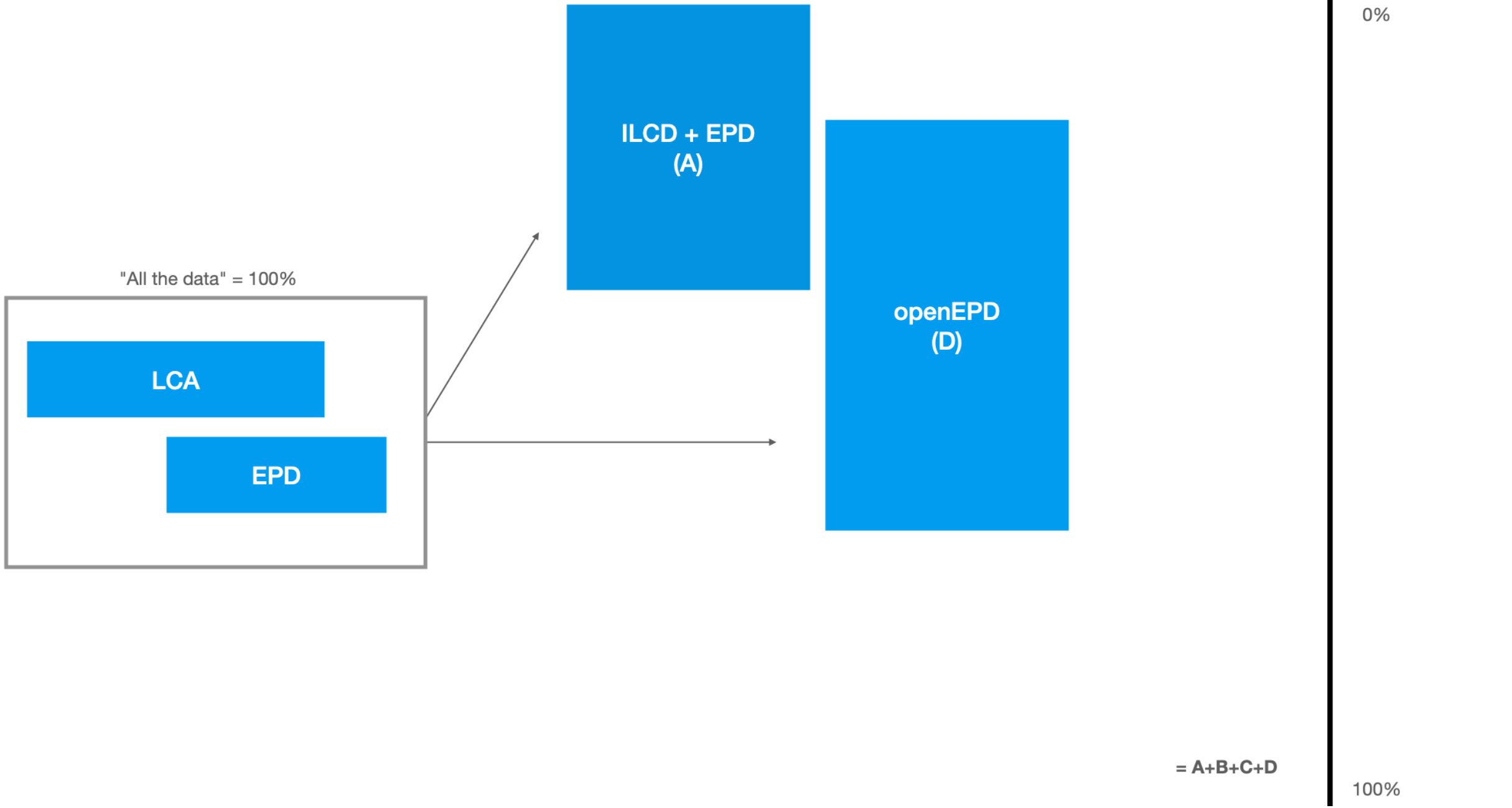
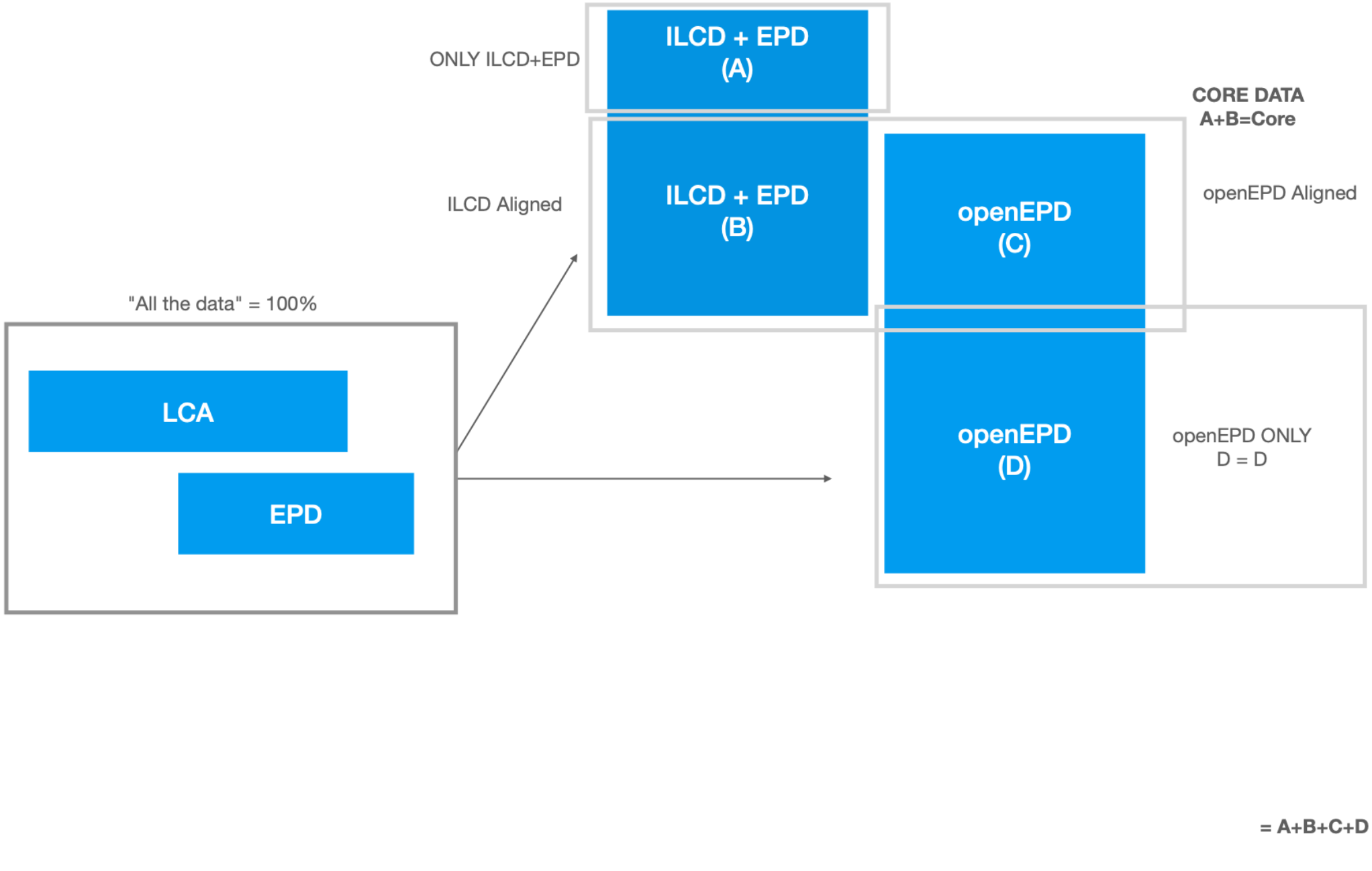
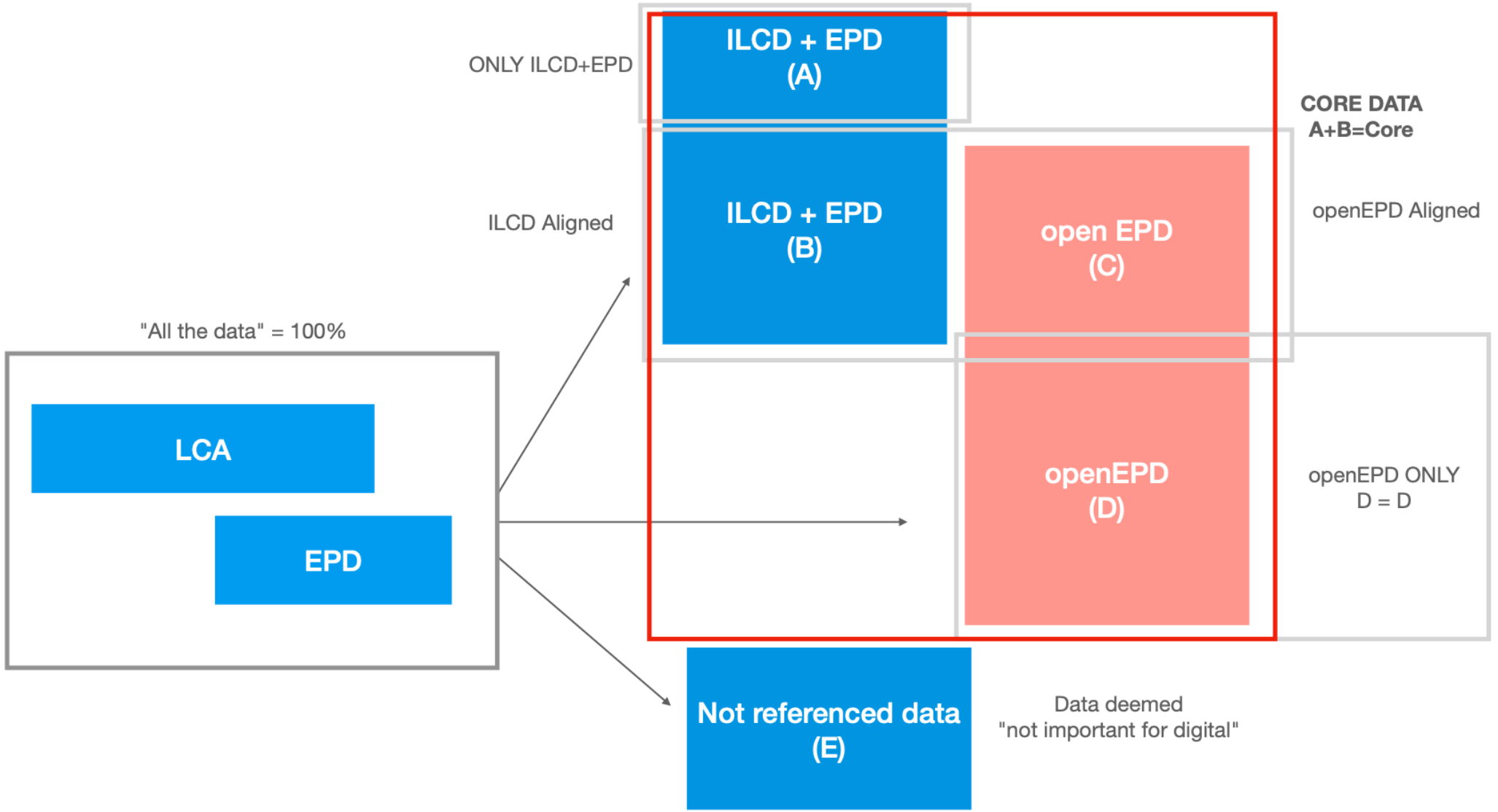

0%
ILCD + EPD
(A)
openEPD
(D)
"All the data" = 100%
LCA
EPD
= A+B+C+D
100%


ONLY ILCD+EPD
ILCD + EPD
(A)
CORE DATA
A+B=Core
ILCD Aligned
ILCD + EPD
(B)
openEPD
(C)
openEPD Aligned
"All the data" = 100%
LCA
EPD
openEPD
(D)
openEPD ONLY
D = D
= A+B+C+D
0%
100%

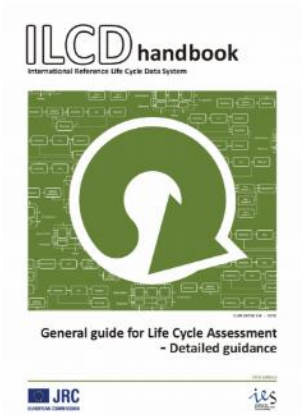

ONLY ILCD+EPD
ILCD + EPD
(A)
ILCD Aligned
ILCD + EPD
(B)
open EPD
(C)
openEPD
(D)
CORE DATA
A+B=Core
openEPD Aligned
openEPD ONLY
D = D
"All the data" = 100%
LCA
EPD
Not referenced data
(E)
Data deemed
"not important for digital"
= A+B+C+D
0%
100%

This prompted two critical questions.

What data do we want?

What data do we need?

Other formats emerged.
Other tools emerged.



Insert Logos of all LCA & EPD software, who created their own data structures just like Trisight and Coldstream.

Assumed to be 60-80 platforms

~86 Data Structures and Counting

This prompted two critical questions.

What data do we want?

What data do we need?

Roundtable for the purposes of figuring out how to collaborate on a single digital format?

What data do we want?

What data do we need?

Left unanswered. So what?

5 data providers with 20 EPD fields =

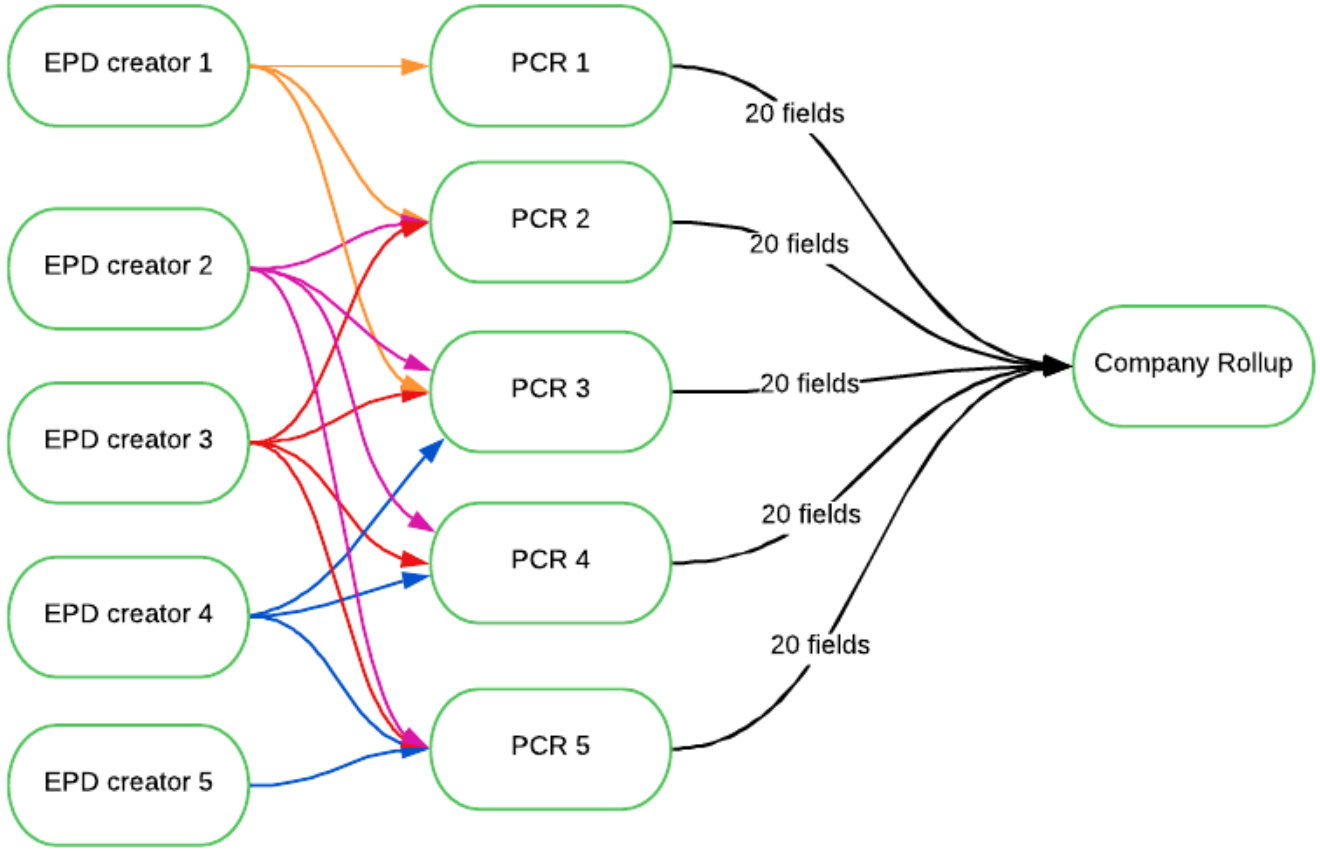
100 chances to be incompatible

… even if 95% of the entries are compatible

5 errors on average destroys a data ingest

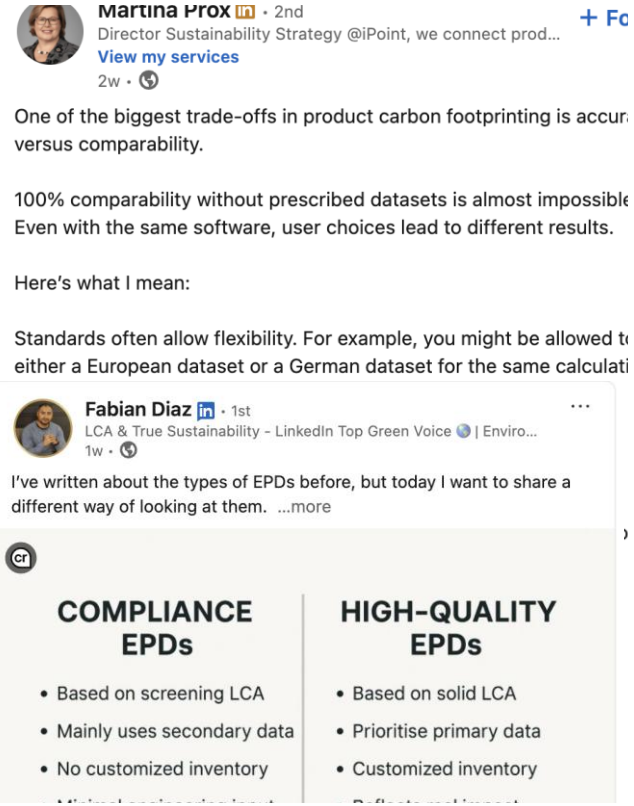
… and then let's add 5 PCRs

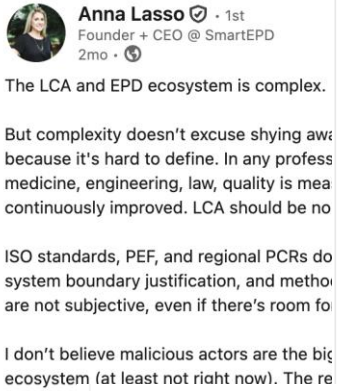
* The issues scale to a 4*3*2*20 = 480, but we'll lea
combinatorics for another day

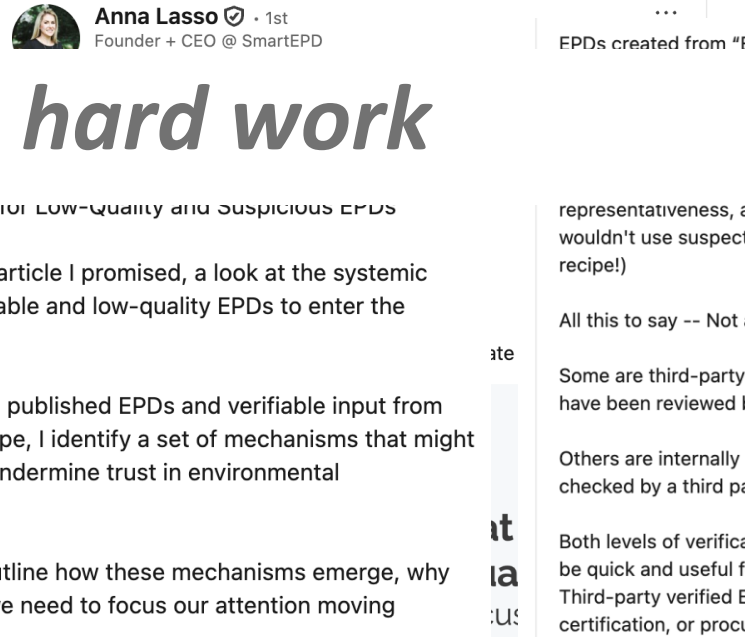


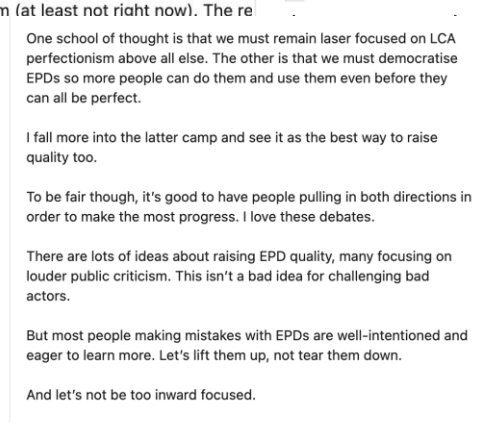
Compounding Digital Issues

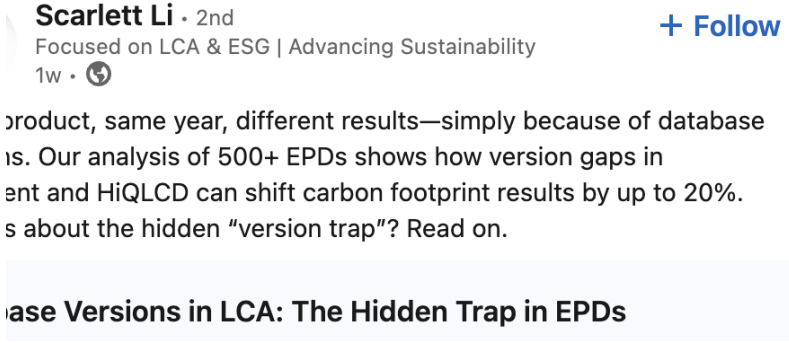
Turns out, scaling digital EPDs is hard work

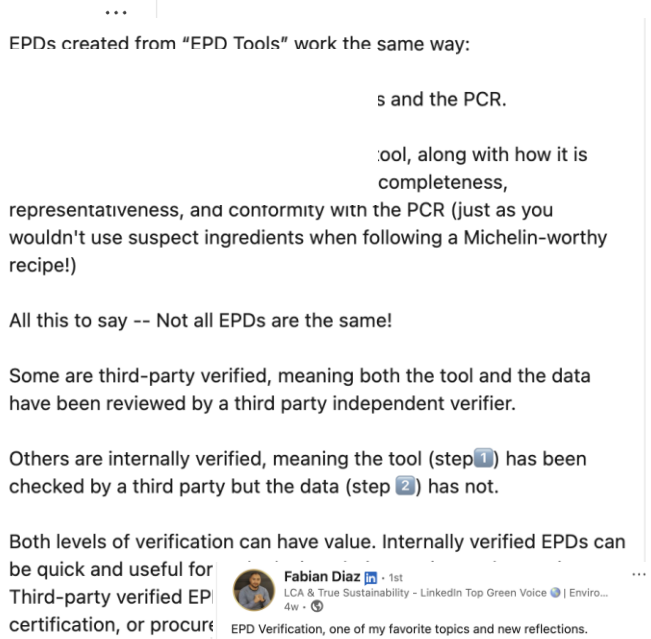


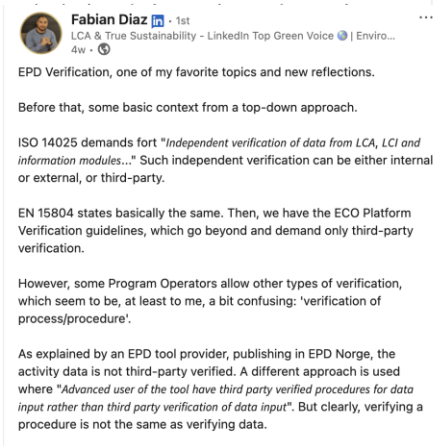




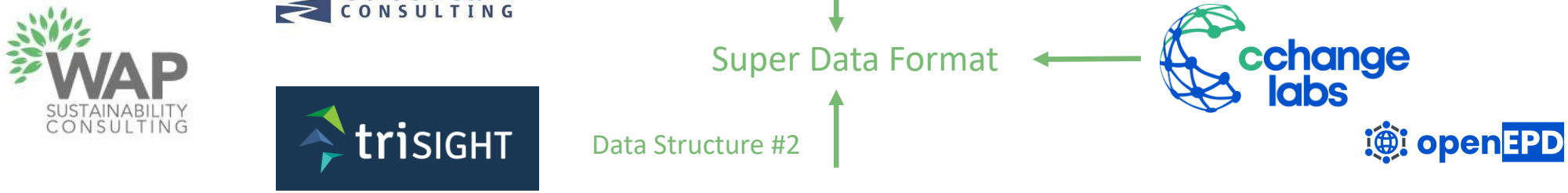








Many opinions, many smart people, ambiguity in standards.
Rooms like this one, built the current EPD ecosystem.

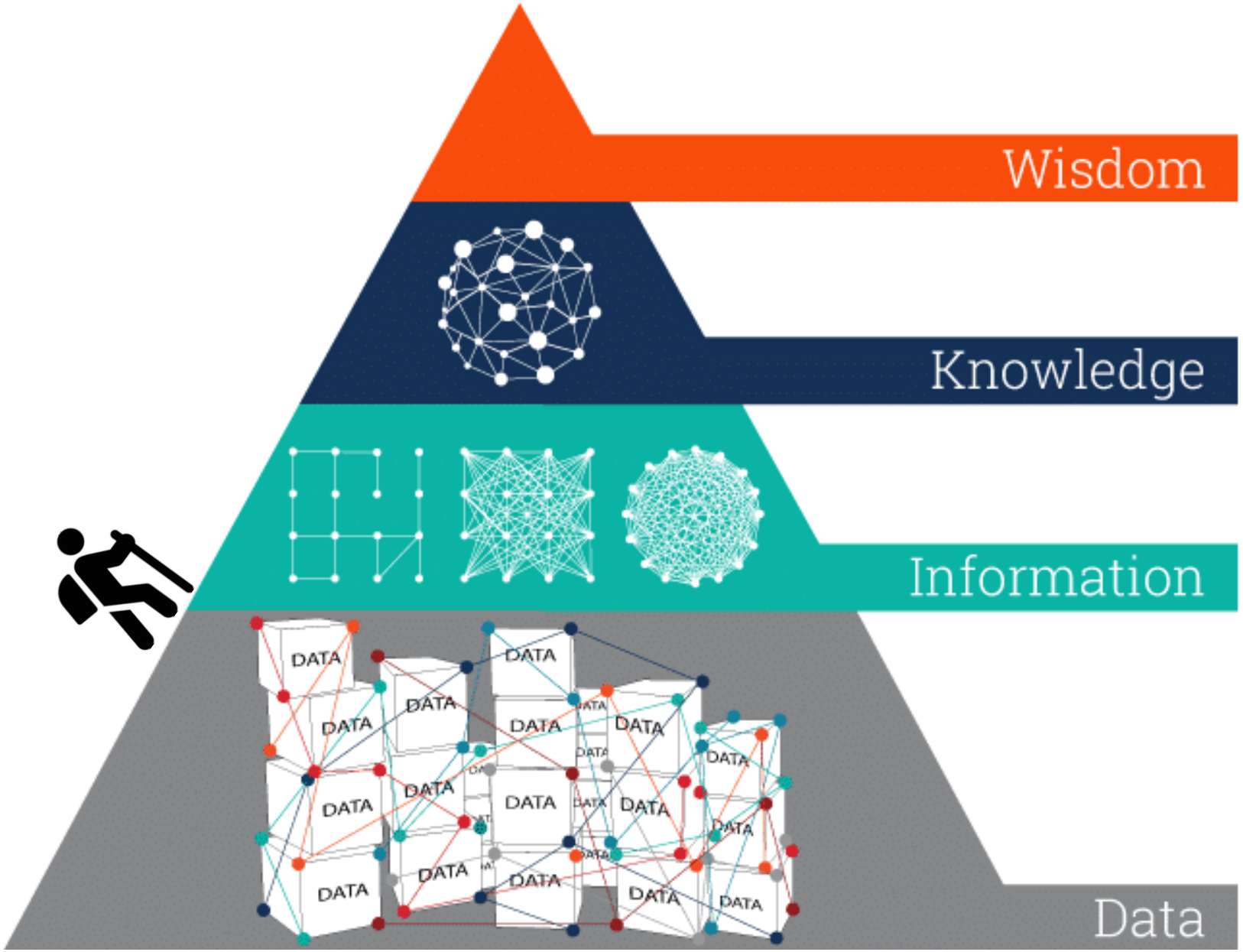


To finish the story of my journey through Digital EPDs and Digital EPD formats, WAP acquired C-Change Labs in October 2024.

“Scaling is about moving from one set of problems to another, bigger set of problems.”

Ben Horowitz, HBR

This is where we see openEPD



Information, Knowledge and Wisdom come from a more open system.

It's how we protect the EPD.

DIKW Pyramid, Robert W. Lucky

“To protect the EPD, we need to make it easier for people to use the EPD”.

William Paddock, WAP

The Vision:

openEPD

One Global Digital EPD Format to Power Knowledge, Trust, and Action

Trust & Transparency

Quality markers to show verification & rigor

Transparency for mass balance, biogenic carbon, PCRs

Clear differentiation of credibility levels

Interoperability & Usability

Globally harmonized EPD & LCA format

Seamless integration across tools & regulators

Flexible design for evolving methods & laws

Unlocks benchmarking, insight & innovation

Governance & Stewardship

Neutral convening body for oversight

Transparent expansion of data typologies

Collaboration across tools, regulators & markets

Future-proof governance for global adoption

Three openEPD Priorities

Governance:

OpenEPD was the original DB structure behind EC3, but it lacked governance, advocacy, financial sustainability, and market integration needed to scale. We are working on Governance models to build a global, trusted digital EPD format.

Process:

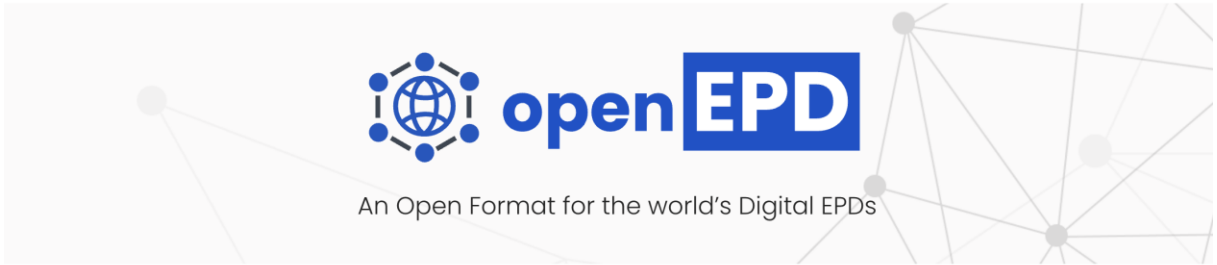
No convening body existed to steward the format, resolve conflicts, or build consensus across industries. We need a process for updates, additions, solutions and revisions. This will be defined through governance.

Format:

We need to answer the questions of what data do we want and what data do we need. We need stakeholder engagement and buy-in at a global level. Our digital EPD format should reflect what data we need and want.

Stewardship and Governance

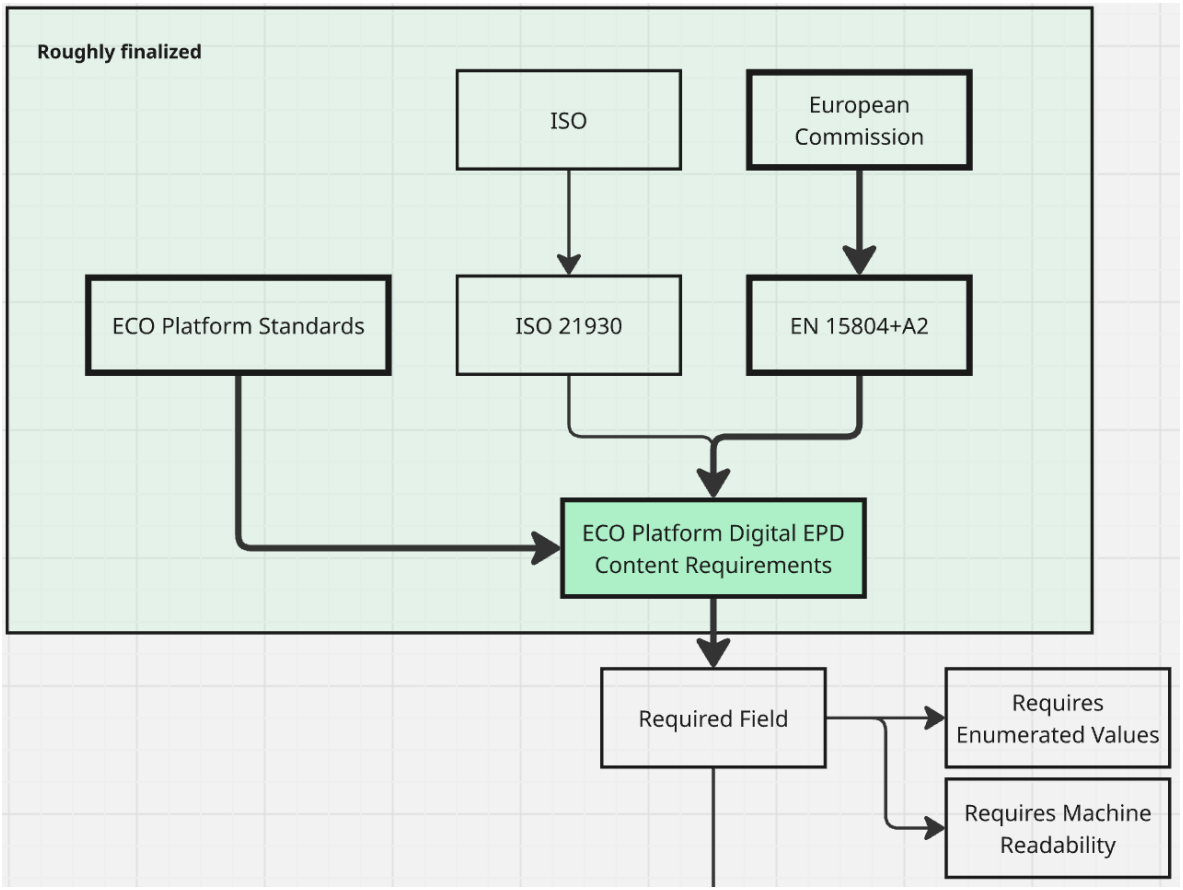
We are committed to openEPD as a public good



- WAP is developing an openEPD governance model
- Prior efforts: openEPD Forum
  - Government, LCA practitioner, software developer engagement
- Shared responsibility for evolving content
- Global responsibility to NA, EU, RoW
  - Opportunities for alignment
- Collaboration with Global Regulators, Consortiums, and Industry associations
- **Noncompetitive**

Process: ECO Platform DDR v2.0 (2026)

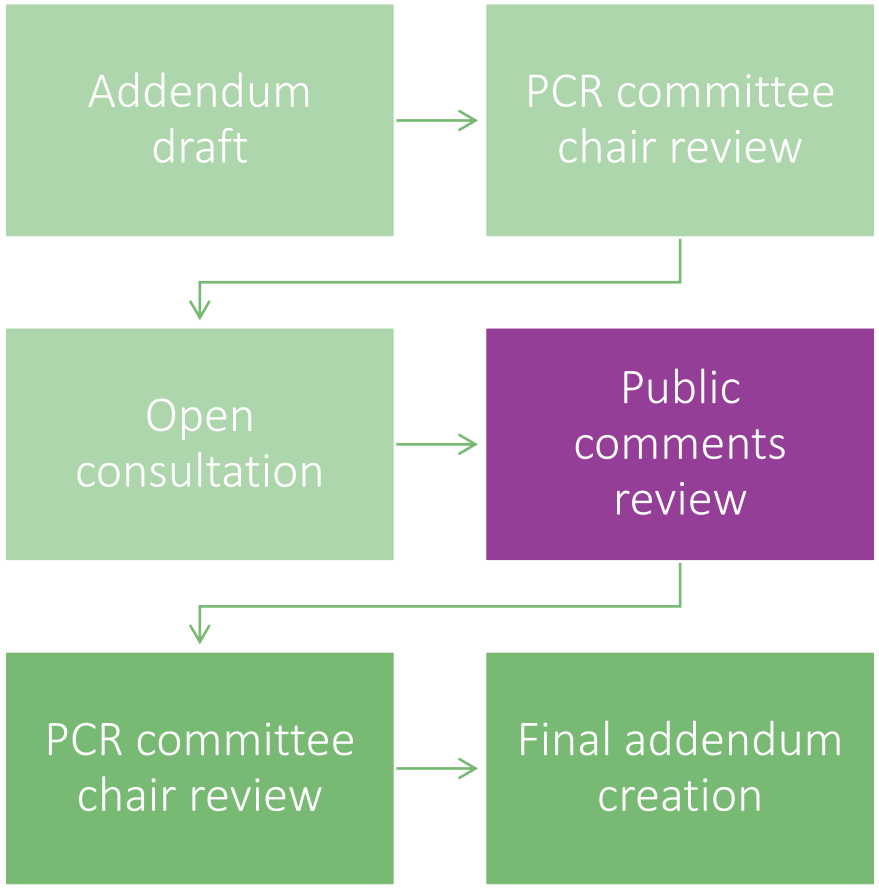
Opening and refining digital requirements in Europe



- Format agnostic
- Focus on EN15804+A2
- Checklist for adopting formats
- Eliminating need for PDF
- Start digitalization of EPD ecosystem
- Increase machine readability
- Future work to include tools, databasing, verification, etc.

Process: ACLCA Digital EPD Guidance

Creating and defining digital requirements in North America



- Addendum in development to further **aid in harmonizing PCRs and digital EPDs**.
- Working group members from:
  - Industry
  - Program Operators
  - Consulting
  - Governmental

Process: Future Change Management

For those using openEPD to create digital EPDs, how do we manage updates and improvements?

OpenEPD Digital Format — Change Management Process

Proposal

Stakeholders submit change requests to governing body.

Review & Consensus

Working group evaluates proposals and builds agreement.

Version Release

New version published with changelog & migration guidance.

Developer Communication

Software providers notified with docs, tools, & webinars.

Adoption & Feedback

Providers update systems, feedback loops into proposals.

Format: Socializing what we need Digital EPDs to do?

(Apart from complying with the PCR)

- Be based on a core data structure
- Document a single product's impact or compliance - *PDF is good enough*
- Combine with 100 other products in a building or project profile
- Combine with 1000 other products to build a company profile
- Help make procurement decisions
- Analyze in bulk to find errors and patterns
- Help designers make design decisions in a CAD tool

Therefore, we need:

- **Open** formats that anyone can produce
- **Interoperable** formats that any system can read
- **Extensible** to meet PCR and stakeholder requirements

Case Study: 'Wifi' or 'USB'

Format: Socializing Digital as EPD creation vs. Representation.

Goal: **The digital file becomes the document of record**

Digital First Creation

Must be able to pass verification

Must be able to create a compliant PDF document

Must be made compatible with target standards & PCRs

Should provide consistency guarantees

Capable of sharing key attribute data

Format: Socializing Digital EPDs as the Future

However, …

- EPDs vary by region, program operator, and PCR
- The market still likes the PDF - for example LEED still requires the PDF
- EPDs from multiple sources need to be readable into tools and databases
- Companies likely will need to publish to multiple digital formats
- Other formats are added over time (e.g., PACT) that will overlap
- Most Regulators don't call out that Digital is Acceptable (USEPA did)

Therefore, we need:

- Adaptable, open formats
- Easily referenceable
- Secure data exchange

And we still have much to solve together!

Format: Socializing Digital EPDs as the Future

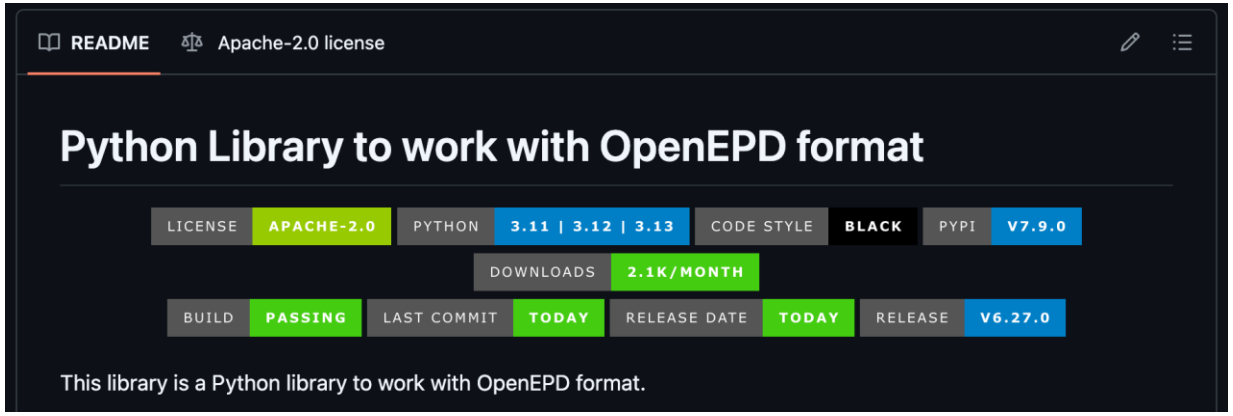
What data do we want?

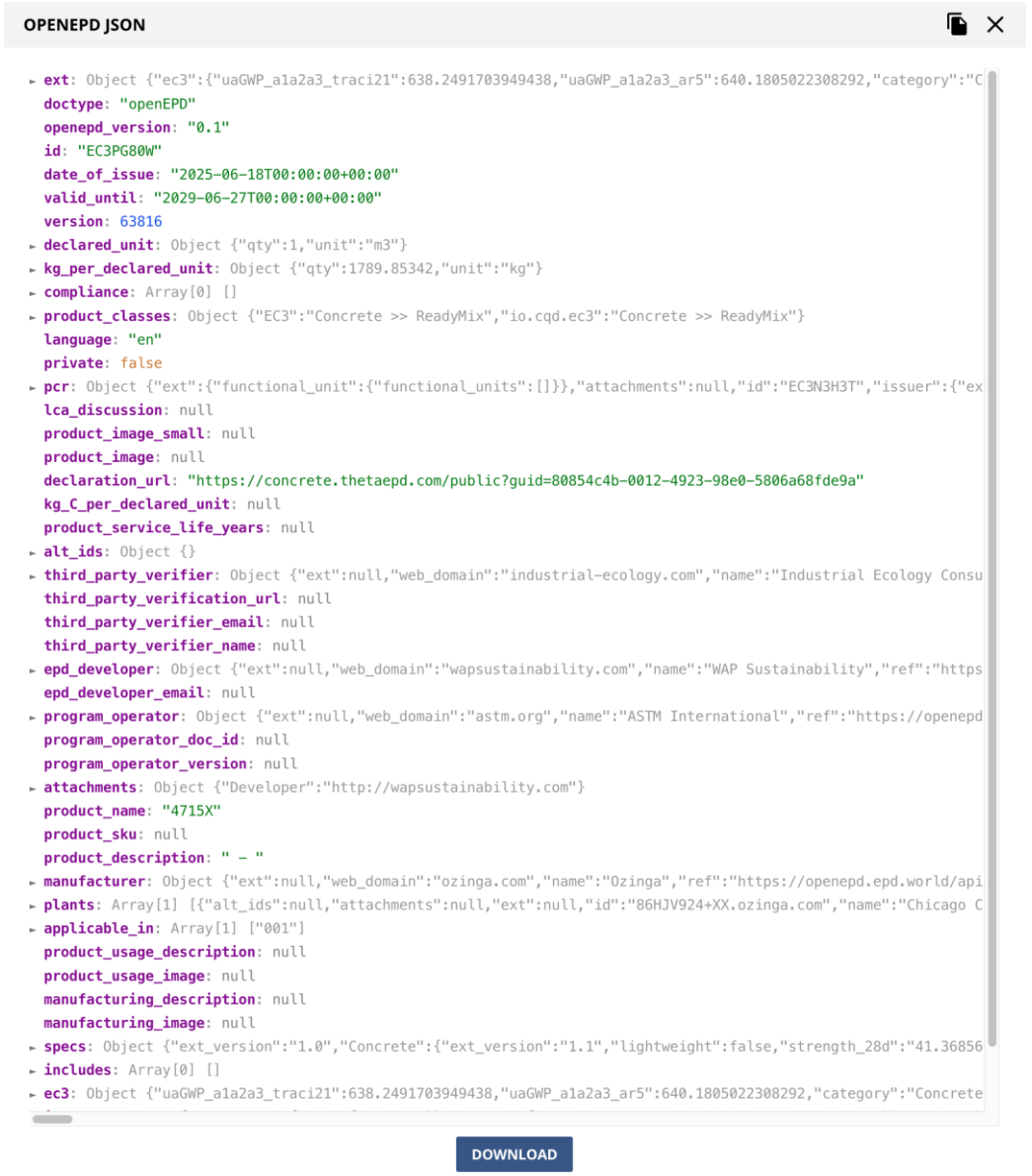
What data do we need?

openEPD

Data structure intended for machine readability and openEPD creation via epd.world

- JSON-based
- OpenAPI 3.0 compatible
- Extension system
- Broad adoption

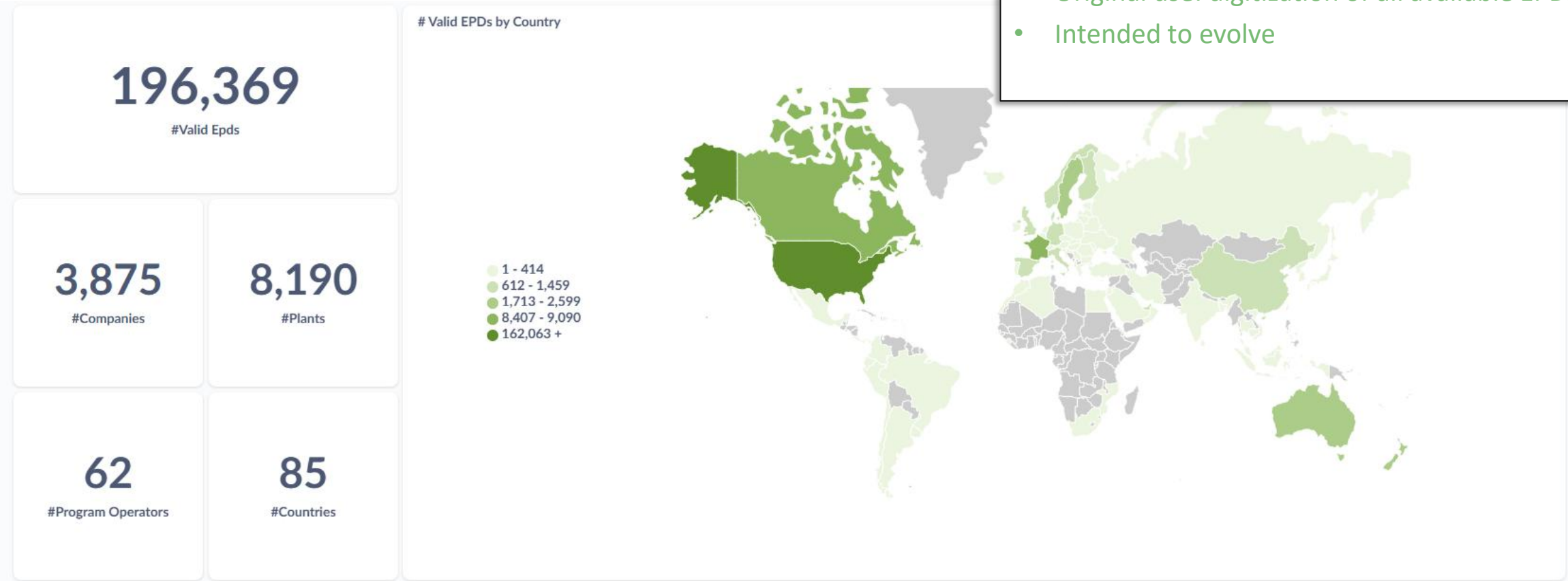




Standards and Compatibility

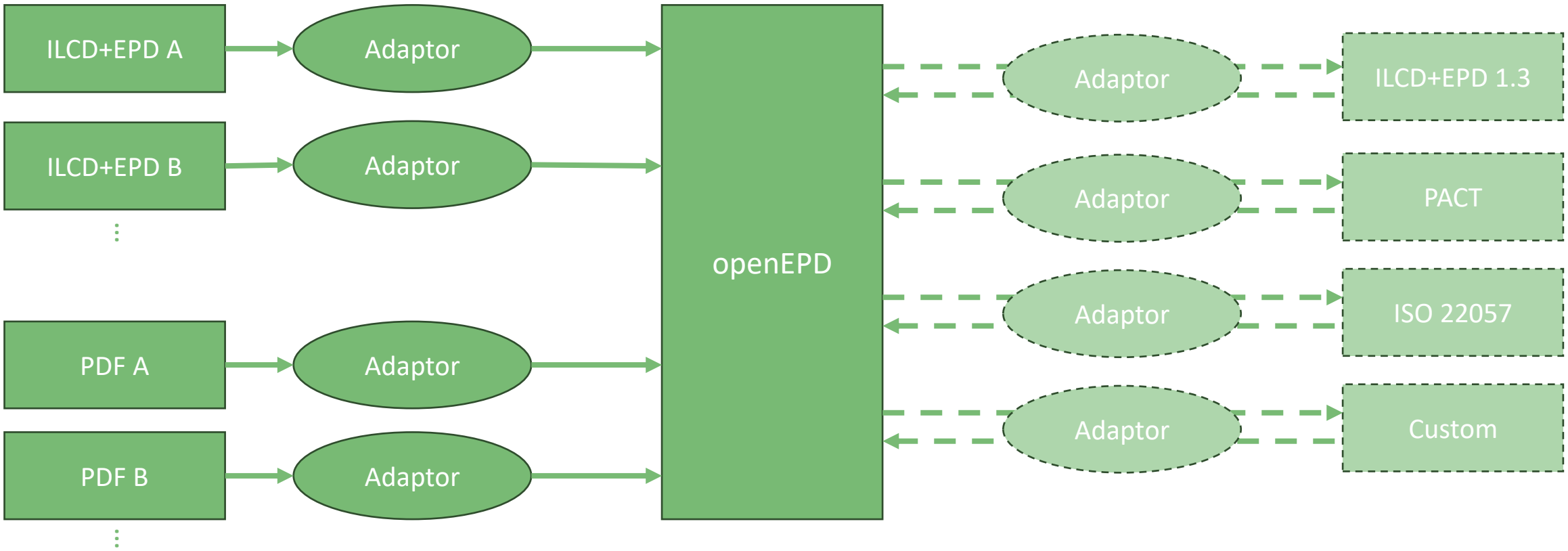
OpenEPD is built. It just needs to be supported.

- Designed to be compatible with ISO 14025, EN 15804, ISO 21930
- Original use: digitization of all available EPDs
- Intended to evolve



openEPD: Proven compatibility

196,000 EPDs and counting

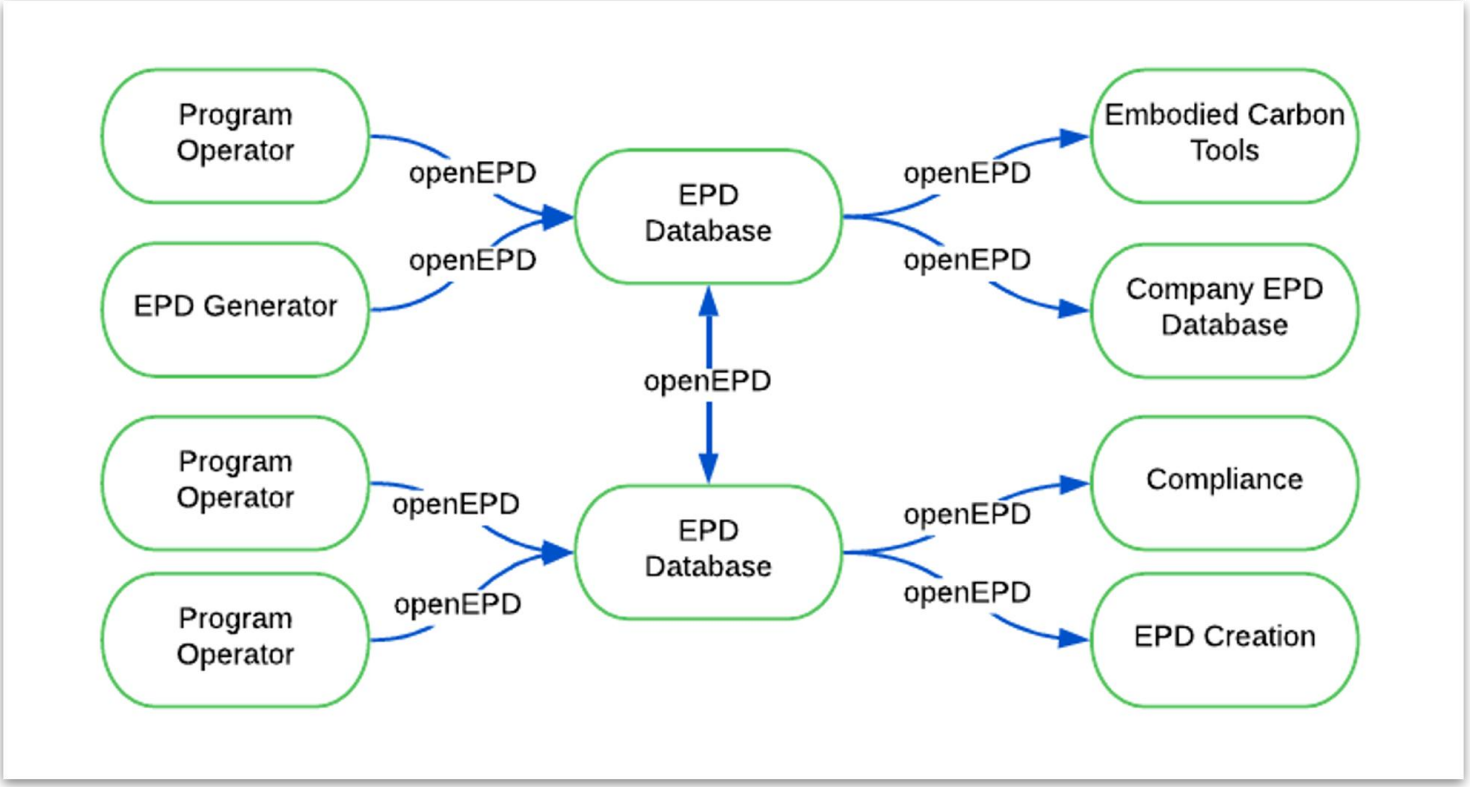


The ability to standardize has been proven

Standard interchange is possible!

Goal: Data Interoperability

Create data flows throughout the ecosystem to support Digital EPD Infrastructure



- OpenAPI 3.0 compliant
- Lightweight, ~10kb per EPD
- Reference implementation
  - Python based
  - Open-source
  - Type checking
  - Reference API

A common interface will allow for easy communication of data.

Licensing

Open-source, free-to-use

The technical specifications are freely and openly licensed under the Apache License 2.0.

The name and logo may be used to refer to openEPD compliant systems, to the openEPD specification, and to the open-epd-forum.org website.

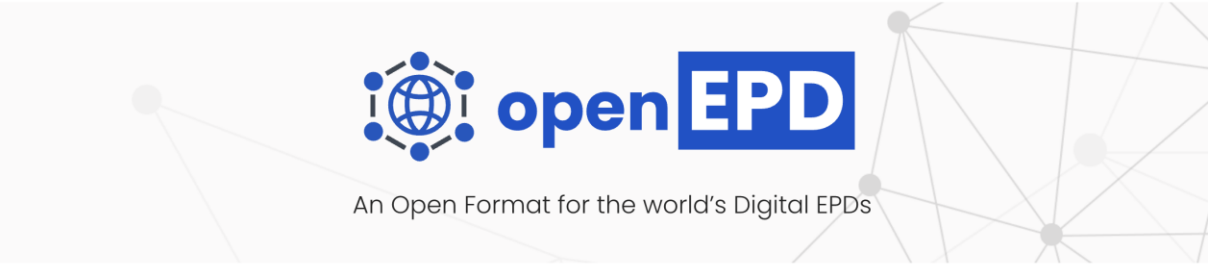
Further governance, membership and revenue models are being explored, collaborated, and likely something for the future. We want to build this with others.

Thank you!

Maintaining openEPD as a public good

Ben Ciavola, Ph.D.
Managing Director, Software & Data
ben@wapsustainability.com

William Paddock
Co-Founder & CEO
william@wapsustainability.com



openEPD is an open data format for passing digital third-party verified Environmental Product Declarations (EPDs) among Program Operators, EPD Databases, Life Cycle Analysis tools, design tools, reporting, and procurement.

Unlike print or PDF EPDs, openEPD provides a shared and precise format to express and refer to EPDs in ways that modern databases can use. openEPD can be used alongside a printable document, or can generate printable EPDs.

Contact me about

- openEPD news & updates
- openEPD standards calls
- Accessing EPDs via openEPD
- Publishing EPDs via openEPD