

U.S. EPA C-MORE

Interim Digital Data Format for EPDs (December 2024)

Objectives: EPA is anticipating the collection of tens of thousands of environmental product declarations as part of the Grant Program: Reducing Embodied Greenhouse Gas Emissions for Construction Materials and Products and the U.S. EPA Label Program for Low Embodied Carbon Construction Materials. There is a need to establish a consistent digital data format to standardize and streamline information exchange between EPA and relevant data providers. This file serves to build upon other EPA work to improve the data quality of the EPD Ecosystem, including the U.S. EPA Criteria for Product Category Rules (PCRs) ([EPA's PCR Criteria](#)), U.S. EPA C-MORE Draft EPD Criteria for Data Quality and Transparency and other data quality improvement efforts found on [EPA's website](#). Future stakeholder feedback may result in changes to this digital data formatting requirement, in addition to potential use by other actors in the digital EPD space.

EPA's Interim Digital Data Format for EPDs is an extension of the existing [openEPD](#) protocol, an open-source format that is widely used by program operators and EPD software tools.

Audience: This document is intended to serve as a complementary document to the [EPA extension to openEPD](#). The EPA extension to openEPD, coupled with the core openEPD protocol itself, provides a list of digital data fields that EPA is anticipating collecting from EPDs as part of its EPD grant opportunity and carbon labeling program. Further, program operators and EPD software tool developers may use this document, and its supplemental list of data fields, as a standardized data format for digitally transferring EPD data to EPA.

Status: EPA is providing this document as an interim data format. EPA intends this document to be released for formal public comment in the coming months. As an interim stakeholder feedback phase, EPA welcomes comments on this interim document by emailing embodiedcarbon@epa.gov. Please include the title of this document in the email.

Overview of EPA's Digital Data Formatting Efforts

As part of EPA's efforts to standardize the reporting of product-level embodied greenhouse gas emissions data via EPDs, EPA has undertaken efforts to improve and standardize the transfer of data found within EPDs. This is critical for numerous EPA efforts, including but not limited to [EPA's Grant Program: Reducing Embodied Greenhouse Gas Emissions for Construction Materials and Products](#) which seeks to create thousands of EPDs for construction products and materials in the U.S. market and the EPA label program. Both efforts rely on EPA collecting EPDs across numerous industries to implement EPA's statutory mandates related to embodied greenhouse gas emissions and ensure that reporting on the use of public funds can be successfully accomplished.

The reason for the anticipated use of a digital format is to reduce the burden on construction material manufacturers and producers, LCA practitioners, and EPA staff in the management and analysis of environmental impact information. The EPA anticipates the adoption of a digital EPD format will improve data consistency, reduce errors in transmission and transcription and result in a more efficient, accurate and effective labeling program.

Furthermore, EPA anticipates that encouraging widespread use of a consistent digital format in the core material categories identified in EPA's C-MORE program will encourage the creation of a more consistent data ecosystem. It is anticipated that overall data quality improvements will be made in these core categories as supply-chain specific declarations become available in openEPD format for use as background datasets.

Collecting EPD data in structured form will allow EPA and other users to:

- Establish digital systems to handle EPDs and their respective data points at scale.
- Ease reporting requirements and check for compliance with specific policies.
- Inform the creation of benchmarks and thresholds.
- Identify and investigate data points of interest.
- Establish policies and procedures for updating data.
- Perform other analyses in support of effective policy implementation
- Coordinate with responsible parties to ensure data quality.

Digital Data Formats for EPDs

Recognizing the EPD ecosystem is transitioning towards machine-readable product declarations, EPA undertook a process to identify existing digital formats for the collection of EPD data. This included the review of the following existing EPD digital data formats:

- ILCD+EPD
- openEPD
- ISO 22057:2022

During EPA's review, input was received from the Federal Highway Administration and National Institute of Standards and Technology. After a review of the noted digital data formats, EPA determined that no existing digital data format would perfectly fit EPA's intended uses. However, openEPD was identified as a digital data format that could be built upon to fit EPA's needs.

As a result of this process, EPA has established an interim digital data format for EPDs in the form of an EPA extension to openEPD for the collection, storage and analysis of environmental impact assessment results.

Relevant features of openEPD include:

- The ability to capture EPD information in a manner compatible with relevant ISO standards in a consistent JSON format,
- The availability of extensive documentation including an OpenAPI specification and an open-source reference implementation at <https://open-epd-forum.org>,
- Provision of an unambiguous way to identify the owner, publisher, verifier, PCR, facility and product associated with each EPD along with the EPD version,
- Structured category-specific extensions for cement, steel, concrete and asphalt, among others,
- Ability to capture material design and performance properties relevant to benchmarking, threshold setting, and labeling activities and
- An extension system allowing specification-compliant third-party augmentation of the format with additional data fields.

EPA anticipates more widespread adoption of openEPD within the United States EPD ecosystem based on these features.

Development of an EPA extension to openEPD

EPA has identified a range of key information whose presence in an EPD, in a standard and structured format, are important to EPA and the public's use of EPDs in procurement research, and other policy considerations related to embodied greenhouse gas emissions. This effort was informed through a [previous public comment period](#) associated with the EPA's PCR Criteria, while EPA also consulted with a select group of stakeholders consisting of EPD software developers and other federal agencies.

Extensions to openEPD can be defined by any third party so long as the extension name does not conflict with that of any existing published extension. Compatibility with the openEPD format requires that all systems that ingest openEPD be able to do so while handling any extension provided as part of the document.

EPA has developed an openEPD extension (ext/us_epa) that EPD producers may use to capture additional information of interest. EPA anticipates implementing database(s) of EPDs containing standard openEPD fields and the additional fields in the EPA extension. Some core openEPD fields and some EPA extension fields are anticipated to be required for EPD submission to EPA systems.

Some key considerations taken in the development of the extension include:

- Ensuring that the digital representation of EPDs transferred to EPA accurately reflects the data found in the corresponding standards-compliant EPD,
- Capturing data about the plant, product and supply chain specificity of the EPD in order to evaluate compliance with existing and emerging Buy Clean policies,
- Capturing data useful in assessing the comparability of EPDs, including
 - The software tool(s) used for LCA performance and EPD creation,
 - The background databases used to calculate life cycle impact assessments,
 - How the impacts of electrical power consumption were calculated, particularly regarding tradable energy attributes such as EACs,
 - Implementing the ACLCA Guidance for handling of Renewable Energy Certificates, other EACs, and onsite generation,
 - The timeliness of the background and primary data used,
 - Explicit reporting of hazardous substances per clause 8.4.1 in ISO 21930:2017 and
 - Explicitly capturing key elements of the EPD's LCA discussion.

An interim technical specification for ext/us_epa can be found here:

https://www.epa.gov/system/files/documents/2024-12/c-more_interim_digital_data_format_epds.xlsx

Once included in the reference implementation, detailed technical documentation in openAPI standard format will be published at open-epd-forum.org.

References

International Organization for Standardization. (August 2017). ISO 21930:2017—Sustainability in Buildings and Civil Engineering Works—Core Rules for Environmental Product Declarations of Construction Products and Services. <https://www.iso.org/standard/61694.html>.

International Organization for Standardization. (April 2022). ISO 22057:2022—Sustainability in buildings and civil engineering works — Data templates for the use of environmental product declarations (EPDs) for construction products in building information modelling (BIM). <https://www.iso.org/standard/72463.html>.

U.S. Environmental Protection Agency. (August 2024). U.S. EPA Criteria for Product Category Rules (PCRs) to Support the Label Program for Low Embodied Carbon Construction Materials (EPA's PCR Criteria) (Version 1—2024). https://www.epa.gov/system/files/documents/2024-10/final-pcr-criteria_8-7-24_5081_0.pdf