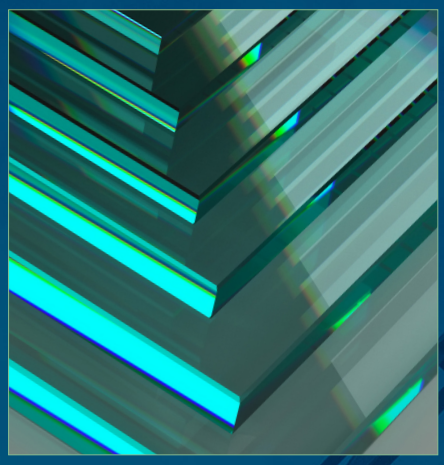

U.S. EPA Criteria for Product Category Rules (PCRs) to Support the Label Program for Low Embodied Carbon Construction Materials (EPA's PCR Criteria) (Version 1—2024)

Office of Chemical Safety and Pollution Prevention
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EPA

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Introduction

The Inflation Reduction Act, passed by Congress and signed into law in August 2022, leverages federal procurement and funding of buildings and infrastructure to catalyze markets for American-made construction materials with lower embodied carbon (also known as lower embodied greenhouse gas emissions). The following two sections of the Inflation Reduction Act provided the U.S. Environmental Protection Agency with $350 million:

- **Section 60112** of the Inflation Reduction Act of 2022 provided EPA $250 million to develop a program to support the development of reporting criteria for environmental product declarations and to enhance their standardization and transparency. These reporting criteria include measurements of the embodied GHG emissions of the material or product associated with all relevant stages of production, use and disposal. The reporting criteria also ensure the EPDs conform with international standards for construction materials and products.
- **Section 60116** of the Inflation Reduction Act of 2022 provided EPA $100 million to identify and label construction materials and products with substantially lower levels of embodied GHG emissions (associated with all relevant stages of the product's life cycle) than similar materials and products.

EPA has developed an approach for EPA's Label Program for Low Embodied Carbon Construction Materials ("Label Program Approach") per Section 60116 of the Inflation Reduction Act. The Label Program Approach includes three phases, which are material agnostic, applicable to any material, and allow materials to move through them at their own pace:

- **Phase I: Data Quality Improvement**. Standardizing and improving the quality of data used to calculate the embodied carbon associated with construction materials and report this information to the market via EPDs.
- **Phase II: Threshold Setting**. Determining thresholds that product types need to meet to be labeled under this program, based on robust EPDs and other credible and representative industry benchmarks and data.
- **Phase III: Labeling Materials and Products**. Labeling construction materials and products that meet thresholds set by EPA.

The primary goal of EPA's label program is to create an easy and reliable way for purchasers to identify and procure lower embodied carbon construction materials and products. During Phase I of the label program, EPA will review the product category rules that govern EPD development under material categories that are seeking to label their products to ensure they align with EPA's PCR Criteria. Also, as part of Phase I efforts, EPA is investing in improving secondary LCA data in coordination with other federal agencies.

The success and efficacy of the label program depends on EPA's ability to access and use representative, accurate and verifiable data to set thresholds for specific product types. As such, EPA's label program will build on the Agency's work under Inflation Reduction Act Section 60112 to support the development of EPDs and EPD reporting criteria and enhance their standardization and transparency. EPDs provide quantified environmental data related to the life cycle stages declared.

They are developed using PCRs, which provide a set of specific rules, requirements and guidelines for developing EPDs for one or more material categories or product types.[1]

This document outlines requirements and recommendations that PCRs must meet for applicable materials and products to be eligible under EPA's label program.[2] Program operators responsible for developing and maintaining PCRs, PCR committees and PCR review panels can use this document to ensure that their PCRs can be used to develop EPDs consistent with EPA's label program requirements. As much of this document is based on existing International Organization for Standardization standards, this document further clarifies and amplifies the existing standards and best practices in the marketplace.

EPA's PCR Criteria are divided into three distinct sets of criteria: "baseline" criteria that PCRs are required to meet now, baseline criteria that PCRs need to meet by 1/1/2026, and "leadership" criteria. The baseline criteria are the requirements that PCRs must conform with for the material category covered by the PCR to be eligible for EPA's label program. The baseline criteria are necessary to ensure consistency within the material category and enable EPA to use the resulting EPDs to develop product type thresholds for the label program. The leadership criteria are considered best practices and strategies to further improve standardization, data transparency and quality. While PCRs do not need to conform with leadership criteria at this time, EPA may consider requiring them as part of the baseline criteria in the future. EPA's PCR Criteria as a whole highlight the larger need for increased rigor in the field of PCRs and EPDs, while also recognizing the current state of the industry and relevant ISO standards.

Program operators and/or PCR committee members who would like EPA to assess PCRs against EPA's PCR Criteria should contact embodiedcarbon@epa.gov for more information on how to participate. EPA is currently prioritizing PCRs covering concrete, asphalt, steel and glass. EPA expects to complete the first round of assessments of PCRs covering key construction materials in fall 2024 and will continue to perform assessments in additional material categories, depending on program priorities and resources.

Challenges with Current PCRs and Standards

There is a lack of consistency in the data quality requirements and process development approaches program operators use to develop PCRs. Within the United States, PCRs are currently subject to ISO standards and technical specifications—namely ISO 14025:2006, ISO 21930:2017 and ISO/Technical Specification 14027:2017, as well as technical guidance documents. However, these standards, specifications and guidance documents do not adequately support the following:

- Transparency and consistency with respect to the scope of EPDs developed under the PCR
- Rigor and consistency in PCR review processes
- Transparency and consistency with respect to life cycle assessment–based data inputs and calculation methodologies
- Requirements for reference LCAs and LCAs that are developed for the PCR
- Procedural aspects of PCR development that are reconciled with voluntary consensus standard processes and other ecolabel program management concerns

[1] Note that PCRs are not "rules" in the EPA regulatory sense.
[2] This document focuses exclusively on PCRs. Additional requirements related to EPA's label program will be established separately; those requirements will include guidance relating to EPDs.

Development of EPA's PCR Criteria

As part of establishing the PCR Criteria, EPA received input from external stakeholders via EPA's Request for Information process and a public comment period for the PCR Criteria. These criteria are also a product of the Interagency Team on PCR Coordination, which includes representatives from numerous federal agencies.[3] While this document was authored by EPA's Office of Chemical Safety and Pollution Prevention, it represents substantial input from the following federal partners and reflects their expertise regarding EPDs and public procurement:

- The U.S. Department of Agriculture
- The U.S. Department of Defense
- The U.S. Department of Energy
- The U.S. Department of Transportation, Federal Highway Administration
- The Federal Emergency Management Agency
- The General Services Administration
- Numerous national laboratories (e.g., Pacific Northwest National Library, National Renewable Energy Laboratory, Department of Commerce's National Institutes of Standards and Technology).
- Other key EPA offices, including the Office of Air and Radiation, Office of Research and Development, and Office of Policy.

Context and Related Efforts

PCRs, as defined in the ISO 14025:2006 standard, are a requirement for the creation of Type III EPDs. PCRs provide material- and/or product category–specific rules, requirements and guidelines for calculating and reporting environmental data across a product's life cycle. Rules analogous to PCRs exist for other types of LCA-based product claims, such as product carbon footprints and product environmental footprints, and other forms of quantitative product environmental footprints. PCRs can support both business-to-business and business-to-consumer communication.[4]

National Efforts in Improving PCRs

Over the past decade, there have been several additional efforts to improve and standardize PCRs. In 2013, the Product Category Rule Development Initiative published "Guidance for PCR Development," in which Ingwersen et al. noted the need for standard PCR templates and to directly connect LCAs to the development of PCRs to ensure consistent environmental impact reporting within categories. In 2019, the American Center for Life Cycle Assessment released an ISO 21930 guidance document that was developed to address a need within the LCA community for clear, consistent guidance for interpreting non-life cycle impact assessment metrics during PCR and EPD development and application.

In 2022, ACLCA released an update to the "Guidance for PCR Development" titled "2022 ACLCA PCR Guidance—Process and Methods Toolkit." This ACLCA PCR Guidance consists of three checklists: one for the program operator, one for the PCR committee, and one for the PCR review panel. The checklists

[3] For information on where EPA and other federal agencies are participating in PCR committees, please visit our website: Product Category Rule Standards and Related Initiatives.
[4] Per the 2013 Guidance for PCR Development (Ingwersen et al., 2013).

outline specific criteria to follow when developing or updating PCRs, as well as how to determine conformance with each criterion. EPA is grateful for the efforts ACLCA and multiple other stakeholders have undertaken to develop the ACLCA PCR Guidance. Many of EPA's PCR criteria outlined here are based on and build upon the ACLCA PCR Guidance.

However, the 2022 ACLCA PCR Guidance was published prior to EPA's directive under the Inflation Reduction Act to develop a label program for low embodied carbon construction materials. While the 2022 ACLCA PCR Guidance suggests helpful improvements to standardize PCR content, format and development, it does not address certain aspects related to data quality and transparency. Therefore, EPA has developed these PCR Criteria to provide more prescriptive guidance to further enable the use of EPDs in public procurement and EPA's label program.

Concurrent with efforts in the United States to improve PCRs, trade associations, state and local governments, academic institutions, and architecture and engineering firms have invested significantly in developing PCRs. Over the past few years, private industry leaders have established PCRs for their respective product categories for North America. In some sectors, this has resulted in wide-scale adoption of EPDs for the disclosure of environmental impacts. This disclosure has enabled both public and private purchasers to estimate their impacts, conduct more thorough whole-project LCAs, and contribute to the development of various state and local government Buy Clean and sustainable procurement initiatives. Without this early private sector investment, efforts to standardize PCRs and EPDs would not be possible, and EPA appreciates efforts taken by these stakeholders and looks forward to continued collaboration via EPA's current Low Embodied Carbon Construction Materials Program efforts.

International Efforts in Improving PCRs

Some institutions outside the United States are undertaking efforts to globally standardize PCR practices and approaches, as well, including the Secretariat of the Clean Energy Ministerial's Industrial Deep Decarbonization Initiative, hosted by the United Nations Industrial Development Organization.[5] In April 2024, these efforts resulted in the release of the Secretariat's Guidance for PCR Harmonization, on which EPA provided input based on its stakeholder engagements relating to the PCR Criteria. This release illustrates how governments across the world are seeking to collaboratively standardize PCRs to consistently convey information about the embodied carbon associated with materials and products across geographic regions. While national governments may have different perspectives on certain items as they pertain to LCAs, PCRs and EPDs, EPA acknowledges that a key first step is to be involved in international standards development to learn from and improve upon domestic efforts. As such, EPA is also committed to engaging with relevant ISO Technical Advisory Groups to update foundational standards, such as ISO 21930:2017, to improve PCRs and EPDs as a whole.

EPA's EPD Assistance Grant Program

As part of Section 60112 of the Inflation Reduction Act of 2022, EPA's Grant Program: Reducing Embodied Greenhouse Gas Emissions for Construction Materials and Products has selected 38 businesses, universities and nonprofit organizations serving all 50 states to receive funding in fiscal year 2024. Selected projects fall under five broad categories:

[5] While the U.S. government participates in this effort, the outputs of this group, such as documents or other guidance, are not to be construed as endorsements or reflective of the official position of the U.S. government or the U.S. Environmental Protection Agency.

- **Robust Data for EPDs**: Projects that contribute new and/or improve critical data, analysis or feedback for producing robust EPDs
- **Robust Product Category Rule (PCR) Standard Development, PCRs, and Associated Conformity Assessment Systems**: Projects that encourage the development of robust, standardized PCRs, including identifying what data needs to be collected for EPDs, how that data should be collected, how it should be reported in EPDs, and what transparency and verification needs to be in place to ensure credible EPDs
- **Robust Tools & Resources to Support & Incentivize Development and Verification of EPDs**: Projects that contribute to the development of tools and resources to make it easier, faster and more cost effective to produce and disclose robust EPDs
- **EPD Development and Verification**: Projects that offer construction material and product manufacturers assistance in producing robust EPDs, or in which a construction material or product manufacturer is producing robust EPDs
- **Robust EPD Data Platforms and Integration**: Projects that support EPD reporting, availability and verification; support the standardization of disparate EPD systems; and support future EPD integration into construction design and procurement systems

These efforts will support an increase in the development of EPDs in line with EPA's PCR Criteria to meet the goals of the Inflation Reduction Act.

PCR Development Process Resources

EPA's Framework for the Assessment of Environmental Performance Standards and Ecolabels for Federal Purchasing (2024) may be used as a resource to further align PCR development processes with voluntary consensus standards processes and other ecolabel program management best practices. EPA uses this framework to assess product and service environmental performance standards. The framework includes criteria to verify if a standard's development process ensures openness, transparency, stakeholder balance and due process—all important to the federal government. Specifically, the Framework includes internationally accepted protocols for standards development organizations (e.g., ANSI Essential Requirements) and U.S. government laws and policies relevant to standardization, including Section 12(d) of the National Technology Transfer and Advancement Act, the Office of Management and Budget's Circular A-119, and the U.S. Government National Standards Strategy for Critical and Emerging Technology. Section I of EPA's Framework for the Assessment of Environmental Performance Standards and Ecolabels is a resource for aligning standards development procedures with U.S. government standards policy. Most PCR program operators have not yet fully adopted these approaches, even though they are voluntary consensus standards developers accredited by the American National Standards Institute. PCR program operators interested in technical assistance in better aligning with voluntary consensus standards approaches may contact EPA.

Future Use and Efforts

While EPA is primarily pulling from existing practices used in the global LCA community and ISO standards, the Agency acknowledges that there are numerous cross-sector harmonization challenges that this version of EPA's PCR Criteria does not currently address (e.g., consistency in allocation methods across product categories). It is EPA's position that true cross-sector harmonization cannot

occur without a voluntary consensus standard that incorporates stakeholders from various construction material sectors, governments, LCA practitioners and other relevant parties. EPA's PCR Criteria are intended to fill this gap until such a voluntary consensus standard and associated conformity assessment program is developed. EPA would welcome the use of the PCR Criteria as a starting point for such an effort.

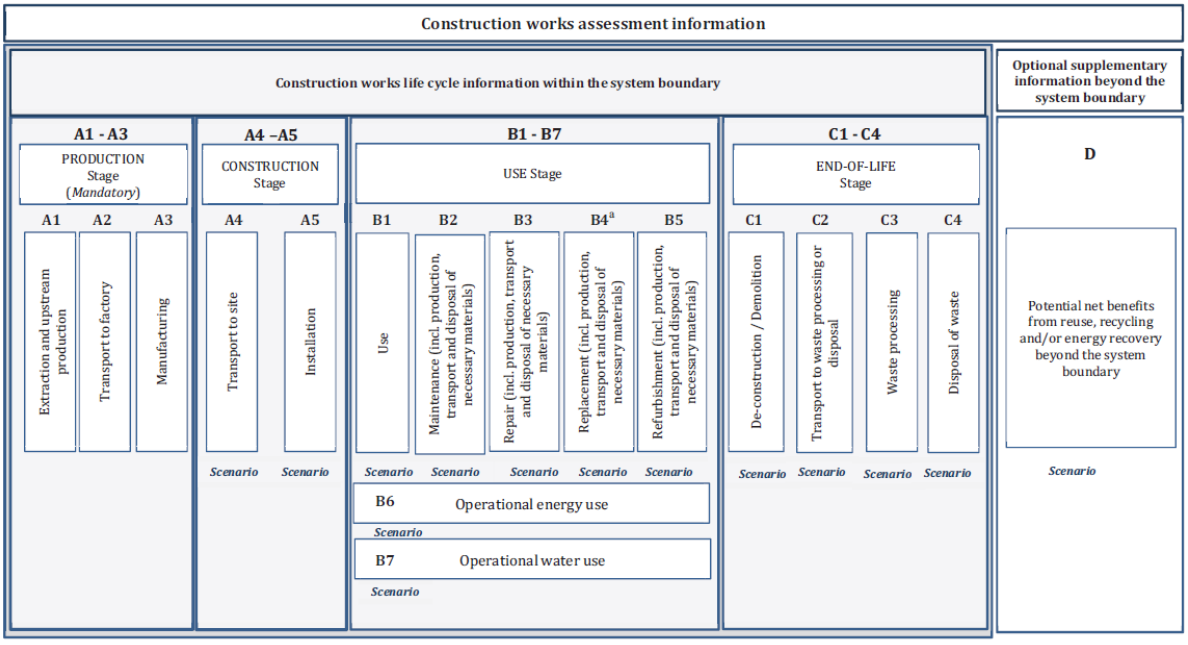
As these and other efforts evolve due to the rapidly growing use of PCRs and EPDs, EPA will consider updating or sunsetting the PCR Criteria as needed to reflect changes in the market.

LCA Context

To help readers of this document identify connections within EPA's PCR Criteria to key existing standards, here is an overview of LCA and PCR elements specified in existing standards and where these elements are covered in this document.

Life Cycle Stages and Information Modules

The impacts associated with a product depend on the scope of the LCA that calculated them. Scopes vary across LCAs but can often encompass life cycle stages such as production, use and end-of-life treatment. Each of these major stages can comprise multiple processes. ISO 21930:2017 delineates and defines broad and universal life cycle stages for construction EPDs (see Figure 1).



[a] Replacement information module (B4) not applicable at the product level.

Figure 1: Life Cycle Stages and Modules for Construction Works Assessment Information from ISO 21930:2017, Section 5.2.1 (see Figure 2 of ISO 21930:2017).[6]

In ISO 21930:2017, module A1–A3 encompass the mandatory production stage: A1, extraction and upstream production; A2, transport to factory; and A3, manufacturing. The other stages are A4–A5

[6] ISO 21930:2017 Section 3.1.8 defines "scenario" as a "collection of assumptions and information relevant to possible future events".

(construction stage), B1–B7 (use stage), C1–C4 (end-of-life stage), and D (potential net benefits from reuse, recycling or energy recovery). PCR committees can use these ISO stages—as well as industry-specific process-level knowledge—to establish standard scopes for the PCRs and the LCAs developed under them. LCA scopes can also include other specified characteristics, such as the defined functional or reference units, type of LCA (e.g., product-specific, industry average), and reported environmental indicator categories. For EPDs to be comparable, the LCAs underpinning them must align in their scopes. When LCA scopes differ, certain products' EPDs may inadvertently appear to perform better or worse than alternatives, potentially leading to issues when using these data for public procurement. As such, Section 1 of EPA's PCR Criteria focuses on ensuring that PCRs used to develop EPDs for the label program have a clearly established scope.

LCA(s) Supporting PCRs

It is important to differentiate LCA(s) supporting PCRs from underlying LCAs that individual EPDs are based on. PCRs represent the rules for how to calculate the LCA-based data reported in an EPD within a given product category. To ensure comparability among EPDs within a given product category, PCRs must effectively anticipate product category–specific strategies that practitioners follow when developing EPDs. Thus, one or more LCA(s) must be used to inform the PCR development process. As outlined in Section 6.7.1 of ISO 14025:2006, program operators and other interested parties should collect and/or produce appropriate LCA(s) that inform development of the PCR (see Figure 2 and Figure 3). This LCA supporting the PCR should communicate the datasets it relied upon, evaluate and provide reasoning for industry-specific modeling decisions, and detail how it handled routine LCA activities (e.g., allocation, limitations, managing assumptions). LCA(s) that support the PCR thus play an important role in PCR development as outlined by ISO 14025:2006. Section 2 of EPA's PCR Criteria therefore seeks to evaluate the relationship between the PCR and its supporting LCA(s).

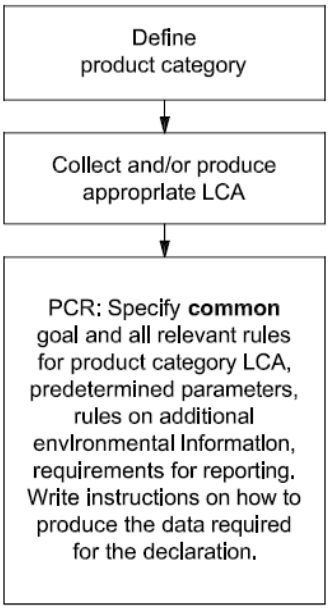
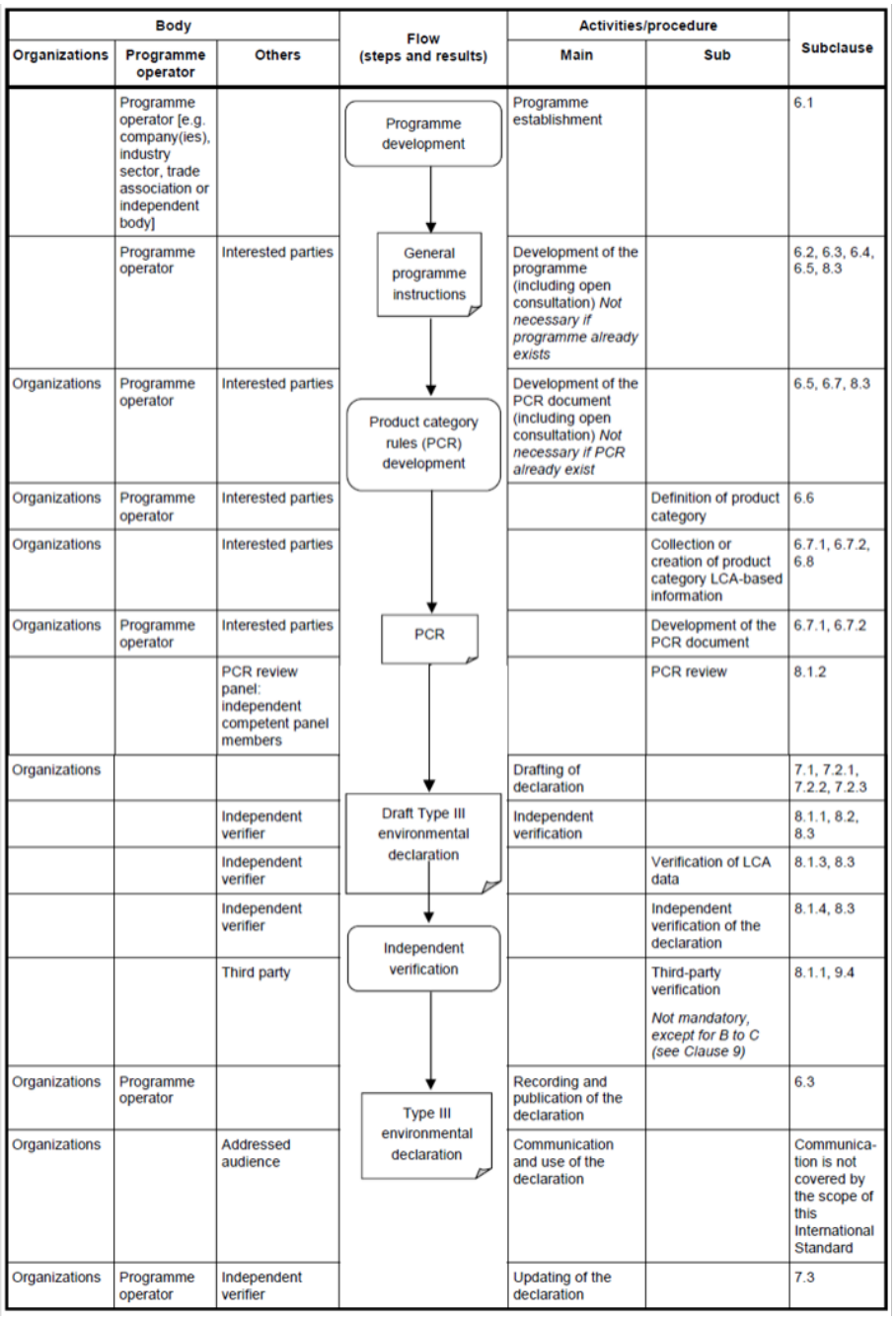


Figure 2: Steps in Preparation of a PCR Document from ISO 14025:2006, Section 6.7.1 (See Figure 1 Within ISO 14025:2006).



Body			Flow (steps and results)	Activities/procedure		Subclause
Organizations	Programme operator	Others		Main	Sub	
	Programme operator [e.g. company(ies), industry sector, trade association or independent body]		Programme development	Programme establishment		6.1
	Programme operator	Interested parties	General programme instructions	Development of the programme (including open consultation) *Not necessary if programme already exists*		6.2, 6.3, 6.4, 6.5, 8.3
Organizations	Programme operator	Interested parties	Product category rules (PCR) development	Development of the PCR document (including open consultation) *Not necessary if PCR already exist*		6.5, 6.7, 8.3
Organizations	Programme operator	Interested parties			Definition of product category	6.6
Organizations		Interested parties			Collection or creation of product category LCA-based information	6.7.1, 6.7.2, 6.8
Organizations	Programme operator	Interested parties	PCR		Development of the PCR document	6.7.1, 6.7.2
		PCR review panel: independent competent panel members			PCR review	8.1.2
Organizations			Draft Type III environmental declaration	Drafting of declaration		7.1, 7.2.1, 7.2.2, 7.2.3
		Independent verifier		Independent verification		8.1.1, 8.2, 8.3
		Independent verifier			Verification of LCA data	8.1.3, 8.3
		Independent verifier			Independent verification of the declaration	8.1.4, 8.3
		Third party	Independent verification		Third-party verification *Not mandatory, except for B to C (see Clause 9)*	8.1.1, 9.4
Organizations	Programme operator			Recording and publication of the declaration		6.3
Organizations		Addressed audience	Type III environmental declaration	Communication and use of the declaration		Communication is not covered by the scope of this International Standard
Organizations	Programme operator	Independent verifier		Updating of the declaration		7.3

Figure 3: Type III Environmental Declaration Program Development and Operation Scheme from ISO 14025:2006, Annex A, Table A.1.

Comparability of Product LCAs

Impact assessment results can vary between life cycle datasets representing the same activities and scopes due to several factors, such as data source, comprehensiveness of inventory data, inventory collection methods, geographic or temporal discrepancies, allocation methods, or even the impact assessment method used. Beyond guidance on use of life cycle inventory datasets, PCRs can affect the comparability of LCAs in how they instruct practitioners to develop foreground data. ISO 14025:2006 Section 6.7.2 outlines key requirements for the comparability of product LCAs developed from PCRs.

For example, each LCA must contain a functional unit, system boundary and data description, among other items. To ensure that LCA practitioners produce comparable LCAs and corresponding EPDs with ease, Section 3 of EPA's PCR Criteria focuses on ensuring comparability and consistency of EPDs and their LCAs by evaluating how PCRs manage data prescription, quality and collection.

EPA's PCR Criteria

The tables that follow in Sections 1.1 through 3.3 provide each PCR criterion—stating the criterion number, the criterion text (i.e., how to fulfill that criterion), the related ACLCA PCR criterion and ISO reference(s), and/or other notes as applicable. EPA is not mandating that PCRs meet these criteria in a regulatory sense. Rather, material categories seeking to participate in EPA's labeling program will be required to have PCRs that conform with the baseline set of criteria outlined within this document. This is to ensure a transparent, fair, technically sound, level playing field for all construction materials and products seeking to participate in EPA's label program.

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ISO/ References
Criterion ID	Baseline or leadership criterion designation	Description and specification of the criterion text	Any standards, guidance or other references used to construct the criterion text

1. PCR Scope and Reference Disclosure

When creating a new PCR or updating an existing PCR, it is critical to ensure that the scope indicates the product types covered by the PCR, as well as the reporting requirements for EPDs based on the PCR. This section outlines specific requirements for PCR scopes.

1.1. Scope of PCR

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ISO/ References
1.1.A	B	The product category scope of the LCA(s) used for the PCR shall be within the scope of the PCR. The scope of the LCA(s) used for the PCR shall serve as the justification of the PCR and its functional (or declared) unit (see Section 2.1.A for PCR reference to the supporting LCA).	ACLCA 2-9; ISO 14025:2006 Clause 3.14, 6.6, 6.7.2; ISO/TS 14027:2017 Clause 6.5.2, 6.5.3
1.1.B	B	The PCR shall include a clearly defined and measurable functional or declared unit.	ACLCA 2-11; ISO 21930:2017 Clause 7.1.2, 7.1.3
1.1.C	B	The PCR shall indicate the types of EPDs that are allowed with respect to life cycle stages covered, with potential options including cradle-to-gate (A1–A3), cradle-to-gate with options (A1–A3, plus other identified information modules), or cradle-to-grave (A1–C4). The PCR should indicate which life cycle information modules are included for a given EPD type. See ISO 21930:2017 Clause 5.2.2 for more information.	ACLCA 2-10; ISO 21930:2017 Clause 5.2.1, 5.2.2

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ISO/ References
1.1.D	B	PCRs that allow EPDs to report information modules beyond cradle-to-gate (either cradle-to-gate with options or cradle-to-grave) shall include scenarios for each life cycle stage beyond the gate that is allowed. When appropriate, the PCR should prescribe a different set of assumptions, parameters and technical information for different product types covered in the PCR. The scenarios should clearly indicate which product type the scenario is connected to, its expected service life, and all other relevant assumptions for each product type. *Note: If the scope of the PCR remains as only capturing information modules A1 to A3, then this item is satisfied provided that the PCR clearly identifies that additional modules and stages are excluded from being reported on EPDs that are developed under the PCR.*	ACLCA 2-16
1.1.E	B	The PCR shall outline which EPD types may be developed with respect to data specificity and state the specific data requirements for each type. Any other terminology describing types of EPDs should be discouraged if it is not included within the PCR. At a minimum, the PCRs must enable the creation of Type III, product-specific EPDs from a singular production or manufacturing facility that are third-party verified against the PCR it was made under (also known as product- and facility-specific EPDs). *Note: EPA understands that there is variation in the nomenclature associated with EPD types and that this is impeding cross PCR alignment and compliance with local, state and federal procurement language. EPA is also aware of efforts to establish a consistent typology for EPDs and will continue to evaluate these efforts for potential future incorporation into this criterion.*	ACLCA 2-12; ISO 21930:2017 Annex B
1.1.F	B	The PCR shall require that an EPD disclose its EPD type with respect to data specificity. For average EPDs, refer to ISO 21930:2017 Annex B for terminology related to types of average EPDs.	ACLCA 2-12; ISO 21930:2017 Annex B

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ISO/ References
1.1.G	B	The PCR shall require that at a minimum, a cradle-to-gate (A1–A3) system boundary (and any deviation) is explicitly specified and justified.	ACLCA 2-14; ISO 14044:2006 Clause 4.2.3.3.1; ISO 14025:2006 6.7.2b, 6.7.2c, 6.7.2j, 7.2.5; ISO/TS 14027:2017 6.5.3b, 6.5.6
1.1.H	B	The PCR shall include criteria for deviation from the prescribed scenarios and require that any such deviation be disclosed in the EPD.	ACLCA 2-16
Section 1.1—Leadership Criteria			
1.1.I	L	The PCR should communicate requirements listing additional environmental information including, but not limited to: • Impacts on GHGs from biogenic carbon • Impacts on GHGs without energy attribute certificates[7] • Impacts on GHGs from Module D • Additional ENERGY STAR information (see Appendix C for more information)	ACLCA 2-29, 2-39; ISO 21930:2017 Clause 8.4; ISO 14025:2006 Clause 7.2.3, 7.2.4; ISO/TS 14027:2017 Clause 6.6

[7] For example, assume the embodied GHGs for a product with location-based electricity accounting is 100 kg CO_2e/unit, and electricity accounts for 20% of that. The manufacturing plant purchases EACs for half of its electricity purchases resulting in the product's embodied GHGs being 90 CO_2e/unit. The lifecycle impact results in the main part of the EPD would disclose a GWP (see footnote 16) of 100 with a note explaining that it was calculated using market-based electricity accounting. The Additional Environmental Information section of the EPD would additionally report that 90 CO_2e/unit is the GWP when location-based electricity accounting is used.

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ISO/ References
		These data will be communicated in a separate additional environmental information section (either qualitative or quantitative information) and reference the methods and format used to report additional environmental information.[8]	
1.1.J	L	The PCR should require market-based accounting of impact indicators in the quantification of impacts section of an EPD when EACs have been procured. In such cases, location-based accounting of impact indicators shall be reported in the "Additional Environmental Information" section of the EPD.	See Appendix D for more information on EACs and renewable energy certificates.

[8] EPA is aware that there may be emerging methodologies that may seek to be added to PCRs, such as alternative chain of custody methodologies. While EPA is not endorsing the use of emerging methods, the inclusion of this text is intended to drive consistent and reliable reporting. As such, if the PCR committee outlines the use of emerging methodologies which may result in shifts in the environmental impacts of a product, the PCR should disclose the use of such mechanism and include a detailed description of the alternative chain of custody approach including the specific methodology used to attribute GHG emissions and any impact to the product GHG emissions reported in the EPD. Such emerging methodologies must not conflict with the existing requirements of ISO 14025:2006, and ISO 21930:2017.

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ISO/ References
1.1.K	L	The PCR should require the inclusion of a unique identifier on all EPDs that are made under it. This should contain the following information: • Entity producing the EPD (not the EPD owner) • EPD Owner • PCR Name and version number • Year of EPD publishing • EPD numeric count • EPD version number PCRs are encouraged (but are not required) to use the following Unique Identifier naming convention: • *[Name of Entity Producing EPD]_[EPD Owner]_[PCR Name and Version number]_[Year of EPD publishing]_[EPD numeric count]_[EPD version number]* For Example: • *ABC Tool Developer_ABC Producer_PCR-for-widgets_1.0_2024_00001_v001*	This criterion will help with provide transparency into the EPDs version which will aid implementors for conformity assessment efforts.
1.2. PCR Reference and Review Disclosure			
1.2.A	B	The PCR shall thoroughly document the use of an existing PCR as an informative document in any adaptation of an existing PCR. The creation of a new PCR that is part of the supply chain or is affected by an existing PCR shall also comply with this criterion. Include the program operator name, existing PCR name and product category classification; link to the existing PCR; and provide justification for adapting the existing PCR.	ACLCA 2-2; ISO/TS 14027:2017 Clause 6.4.3;

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ISO/ References
1.2.B	B	The PCR shall list the referenced standards the PCR is in conformance with and link to relevant program instructions. This should include year of publication of the referenced standards. Specifically, the PCR shall be in conformance with the following standards: • ISO 21930:2017 • ISO 14025:2006 *Note: Effective January 1, 2026, the PCR shall also be in conformance with ISO/TS 14027:2017.*	ACLCA 2-6
1.2.C	B	The PCR shall list the specific standards it conforms to. *Note: Effective January 1, 2026, the PCR shall list any upstream and downstream PCRs it aligns with.*[9] *In cases where the PCR does not align with upstream and downstream PCRs in areas of allocation (including recycling/recycled content allocation), cut-off criteria, required secondary datasets, carbon capture utilization and storage, biogenic carbon accounting, and any other aspect as determined by the PCR committee, the PCR shall identify and explain such deviations.* *Note: See Criterion 2.1.J for more information on allocation and harmonization with upstream and downstream PCRs.*	ACLCA 2-8; ISO/TS 14027:2017 Clause 6.5.5
1.2.D	B	For PCRs that go out to review after the publishing of this document, a review panel shall conduct a PCR review in accordance with ISO 14025:2006 and ISO/TS 14027:2017. *Note: Effective January 1, 2026, a PCR review panel shall use ISO/TS 14071:2014 to organize and conduct the PCR review. The signed PCR review statement from the PCR review panel shall indicate whether the review was done in accordance with ISO/TS 14071:2014.*	ISO 14025:2006, Clause 5.7, 6.3.H, 6.3.I, 6.4.J, 8.1.2, 8.2; ISO/TS 14027:2017, Clause 7; ISO/TS 14071:2014

[9] Upstream and downstream PCRs are not required to conform with EPA's PCR Criteria for products for the PCR under considerations to be eligible for the label program.

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ISO/ References
Section 1.2—Leadership Criteria			
1.2.E	L	Program operators should adopt requirements for PCR review panel members and EPD verifiers within its General Program Instructions that are consistent with EPA's Recommended PCR reviewer and EPD verifier qualifications as shown in Appendix E.	ISO 14025:2006, Clause 6.4.J, 8.1.2, 8.1.4, 8.2; ISO/TS 14071:2014 Annex B
1.2.F	L	The PCR should include a link to the program operator's website for the PCR committee's documented public response to each comment received.	ACLCA 2-3
1.2.G	L	The PCR should include a permanent link to each of the previous editions of the PCR. The PCR may also include a summary of changes made from the previous version.	This criterion will connect the resulting PCR to prior versions for transparency into edits made between versions.

2. Criteria Addressing LCAs in PCRs

To ensure consistent environmental impact reporting in EPDs, it is necessary to build a PCR using either an LCA produced for that PCR[10] or a reference LCA. These differ based on when they were conducted. An LCA produced for a PCR is generated in conjunction with the PCR development, while a reference LCA precedes the development of a PCR.[11] Having LCAs produced for PCRs is in accordance with ISO 14025:2006,[12] Section 6.7.1, in which a PCR committee determines the PCR scope, conducts an LCA(s), and outlines rules for consistent modeling within the product category. Given this, LCAs produced for PCRs are preferable due to their synergies with the PCR; these LCAs lead to mutually beneficial outcomes in both efforts and are consistent with ISO 14025:2006. When fully implemented, the criteria below will lead to LCAs that algin in scope regarding covered products, impact assessments, system boundaries, allocation rules, prescribed flows and other items covered within this section. However, due to time constraints with implementing EPA's label program and industry investments to date, EPA is not favoring a PCR that has LCAs produced for it over a PCR that uses a reference LCA. Section 2.1 applies to both types of LCAs (collectively referred to as "LCAs used for PCRs"), while Section 2.2 details additional requirements for "reference LCAs" only.

[10] "An LCA produced for a PCR" constitutes the underlying LCA as defined in the "Terminology" section of this document under "LCA produced for the PCR (underlying LCA)."
[11] This section only addresses LCAs used in support of the PCR process and is not applicable to LCAs completed for each individual manufacturer EPD.
[12] See ISO 14025:2006, Section 6.7.1, Figure 1, and Annex A-1.

2.1. LCA Criteria (for Both Reference LCAs and LCAs Produced for the PCR)

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ISO/ References
2.1.A	B	The PCR shall be linked to an ISO 14040:2006/ISO 14044:2006 conformant attributional LCA(s) and other relevant studies that inform the modeling of all product types within the scope of the PCR. The LCA(s) shall meet the requirements of ISO 14044:2006, alongside other pertinent standards and will have been either critically reviewed by a third party or undergone an internal verification, either by the PCR committee or appointed independent LCA expert.[13]	ACLCA 2-5; ISO 14040:2006; ISO 14044:2006; ISO 14025:2006 Clause 6.7.1, 6.7.2, 8.1.3, 8.2.1, 8.2.2; ISO/TS 14027:2017 Clause 5.1, 6.1, 6.5.3, 7.1d ISO/TS 14071:2014
2.1.B	B	The LCA report must be publicly posted and accessible via a web link included in the PCR. The publicly posted LCA(s) shall include the required minimum nonconfidential information outlined in Clause 5 of ISO 14040:2006. Additionally, the LCI data within the LCA(s) used for the PCR may be aggregated to protect the confidentiality of manufacturer-specific details.	This criterion will ensure the LCA is disclosed.
2.1.C	B	Both the LCA(s) used for the PCR and the PCR shall specify appropriate functional (or declared) unit(s), scope of the study, inventory collection methods, impact assessment, any allocation assumptions/rules, and additional information/rules. The functional (or declared) unit can include at least two parameters to further define the product such as area, mass and volume.	ACLCA 2-8; ISO 14044:2006; ISO/TS 14027:2017 Clause 6.5

[13] ISO 14025:2006 requires PCRs to be based on one or more LCAs (in accordance with the ISO 14040 series of standards) and other relevant studies. These documents are collectively referred to as the LCA(s) used for the PCR throughout this PCR Criteria document.

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ISO/ References
2.1.D	B	The PCR shall specify all core LCIA indicators for ISO-compliant LCAs and EPDs; specifically listing the indicator with the LCIA characterization methodology and provide a reference to the LCIA characterization methodology. At a minimum, this should include LCIA indicators outlined in Table 5 of ISO 21930:2017. Alternatively, the PCR shall specify additional information requirements for which relevant inventory information shall be collected. *Note: The PCR is encouraged, but not required, to specify at least one LCIA method that includes characterization factors for calculating results for each impact category and each geographical region covered by the PCR.*	ACLCA 2-19; 2-37 ISO 14025:2006 Clause 7.2.2, 7.2.3; ISO/TS 14027:2017 Clause 6.5.4, 6.5.5, 6.6; ISO 21930:2017 Table 5, Clause 7, Clause 9.5
2.1.E	B	The PCR shall specify, based on the LCA(s) used for the PCR, all the inventory data, by process, to be collected. Inclusion and cut-off criteria to inform these lists shall be determined based on results of the LCA. The PCR committee shall communicate their methods for performing cut-off analyses in the PCR. In cases where the LCA(s) used for the PCR is not aligned with the PCR in terms of allocation or required secondary datasets, decisions such as excluded parameters that fall below the cut-off criteria shall be evaluated to ensure consistency with the allocation approach and required secondary datasets in the PCR.	ACLCA 2-8, 2-20; ISO 14025:2006 Clause 6.7.1; ISO/TS 14027:2017 Clause 6.5, 6.6
2.1.F	B	The PCR shall specify all parameters of assumed scenarios for major (as determined by the LCA(s) in support of the PCR) use (B1–B5) and end-of-life (C1–C4) stages to ensure comparability and consistency of results. PCRs may allow for deviations from the default parameters and in such cases must specify the evidence that is required to justify a deviation.	ACLCA 2-27
2.1.G	B	The PCR shall specify which processes for relevant manufacturing steps are to be subdivided. The PCR shall also provide guidelines on how the subdivision should be performed, including the necessary primary data requirements, as informed by the LCA(s) used for the PCR.	ACLCA 2-32; ISO 14025:2006 Clause 6.7.1c, 6.7.2c; ISO/TS 14027:2017 Clause 6.5.3; ISO 21930:2017 Clause 7.2.5.5

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ISO/ References
2.1.H	B	The PCR shall prescribe ISO 21930:2017–compliant rules for allocation between product systems (across the system boundary) and designate whether Module D may be optionally reported in the EPD. If Module D is prescribed for inclusion by the PCR committee, the PCR shall prescribe detailed calculation rules for any quantitative metrics reported therein and require that results of Module D are reported separately.	ACLCA 2-36; ISO 21930:2017 Clause 5.2.1, 7.2.6, 9.4.7
2.1.I	B	The PCR shall specify where allocation by physical relationship is applied, specify the relevant underlying physical relationships to be considered, and establish or refer to the relevant allocation rules.	ACLCA 2-33; ISO 14025:2006 Clause 6.7.1c, 6.7.2c; ISO/TS 14027:2017 Clause 6.5.3; ISO 21930:2017 Clause 7.2.5.2, 7.2.5.5
2.1.J	B	The PCR shall define allocation procedures for reuse, recycling, and waste handling, and for scenarios for treating waste generation during the product life cycle based on the requirements in ISO 14044:2006 Clause 4.3.4 and ISO 21930:2017 Clause 7.1.7.2.7. If the PCR committee determines that a coproduct or byproduct exists, the PCR shall demonstrate steps taken to reach harmonization across PCR boundaries, such as reaching out to the impacted PCR committees to work toward cross-PCR harmonization. If the PCR committee is unable to reach harmonization with related PCRs but is aware of other PCRs' differing approaches, it shall report the alternative allocation procedures used by upstream and downstream PCRs.	ACLCA 2-34; ISO 14044:2006 Clause 4.3.4; ISO 21930:2017 Clause 7.1.7.2.7
2.1.K	B	The PCR shall not use system expansion as a method for avoiding allocation for construction products that may involve the production of coproducts. Rather, the PCR shall prescribe an ISO 21930:2017–compliant method of allocation based on the LCA used for the PCR.	ACLCA 2-35; ISO 14044:2006 Clause 4.3.4.2; ISO 21930:2017 Clause 7.2.5.4

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ISO/ References
2.1.L	B	If an LCA report is produced for the PCR as part of the PCR development process, the LCA produced for the PCR shall outline any gaps or data variations within its report and the PCR shall outline these within the PCR itself. *Note: EPA acknowledges that there may be emission data variability in the associated primary and/or secondary data that can impede cross PCR alignment and the effective use of EPDs as a procurement tool. EPA is aware of efforts to identify or define data variability in EPDs, and currently is not in a position to endorse analysis or calculation methodologies for data disclosure for LCAs, PCRs or EPDs.*	ACLCA 2-41; ISO 14044:2006 Clause 4.4.4.2; ISO 14025:2006 6.7.1b
2.1.M	B	The PCR shall include a system diagram(s) that represents all unit processes in scope for the LCA used for the PCR. In cases where a product is typically manufactured across several facilities, the system diagram(s) shall clearly visualize the separate facilities and identify the various LCA modules for which impacts will be reported.	This criterion ensures that PCRs clearly outline which unit processes are being modeled based on the LCA used for the PCR. This enables a clear disclosure of modeling scope to end users.
2.1.N	B	The PCR shall require EPDs to clearly disclose limitations to comparability as informed by the LCA(s) used for the PCR.	ISO 14044:2006 Clause 4.5; ISO 21930:2017 Clause 5.5
Section 2.1—Leadership Criteria			
2.1.O	L	The PCR should use the LCIA indicator list outlined by EPA (please visit EPA's website for the most recent file) until an update to the Tool for Reduction and Assessment of Chemicals and Other Environmental Impacts (TRACI 3.0) is released. Once TRACI 3.0 is published, EPA encourages all PCRs to switch to TRACI 3.0 for LCIA indicators outlined in Table 5 of ISO 21930:2017, in lieu of TRACI 2.1.	This criterion will help reach consistency in IPCC global warming potential factors used throughout PCRs.

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ISO/ References
2.1.P	L	The PCR should list assumptions and limitations associated with findings from the LCA used for the PCR. At minimum these should include assumptions outlined in ISO 14044:2006 Clause 4.5.2.1 and LCIA limitations outlined in ISO 14040:2006 Clause 5.4.3.	ACLCA 2-40; ISO 14044:2006 Clause 4.5.2.3; ISO 14040:2006 Clause 5.4.3

2.2. Reference LCA Criteria (Only Applicable If an LCA Is Not Produced for the PCR)

Criteria #	B/L	Criterion	ISO References
2.2	B	If a PCR uses a reference LCA in lieu of an LCA produced for the PCR, the reference LCA shall meet the following criteria, in addition to the relevant baseline criteria identified in 2.1: a. Is publicly accessible. b. Was published within five years prior to the open call for participants of the PCR. c. Meets all relevant ISO standards that are outlined in this document (ISO 14040:2006, ISO 14044:2006, ISO 21930:2017, ISO/TS 14027:2017, ISO 14025:2006). d. Has a scope aligned with that of the PCR. e. Conforms to ISO 14044:2006 regarding LCAs. f. Is attributional. g. Conforms to the allocation rules of ISO 21930:2017.	ISO 14044:2006; ISO 14040:2006; ISO/TS 14027:2017; ISO 14025:2006; ISO 21930:2017 Clause 7

3. Specification of Data

To ensure the standardization and transparency of data reporting for EPDs, it is necessary to establish a standard of practice for the specification of data within a PCR.

3.1 Data Collection Specification

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ISO/ References
3.1.A	B	The PCR shall prescribe minimum required primary data collection practices and data quality, as determined by the PCR committee and informed by the LCA(s) used for the PCR. Primary data requirements shall be mapped to the appropriate unit processes within the product system. All data shall be provided in standard SI units in addition to any other unit(s) of measure specified by the PCR.	ACLCA 2-13, 2-18; ISO 14044:2006 4.2.3.3; ISO/TS 14027:2017 Clause 6.5.3; ISO 21930:2017 Clause 7.1.9
3.1.B	B	The PCR shall clearly specify the scope and data quality for secondary data and include recommendations for free-to-use and publicly accessible datasets or databases facilitating this process.	ACLCA 2-18; ISO 21930:2017 Clause 7.1.9
3.1.C	B	The PCR shall specify mandatory primary data that are to be collected for every foreground process in the product system under the control of the organization making the product claim. The PCR shall also specify that data specific to the investigated product scope and supply chain shall be used over generic data unless such specific data are not available. The PCR's specifications of the type of data to be used shall be supported by LCA that supports and aligns with the scope of the PCR.	ACLCA 2-24

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ISO/ References
Section 3.1—Leadership Criteria			
3.1.D	L	The PCR should specify the type of data to be collected and appropriate methods for primary data collection (e.g., metered utilities, standard formulas, direct measurements). The PCR may provide templates to facilitate harmonized data collection, metadata recording and results reporting (e.g., measured, calculated, estimated). If the specified data collection means are unachievable for a specific EPD developer, the PCR should designate that the developer records the data collection method(s) utilized in the data description.	ACLCA 2-26; ISO 14025:2006 Clause 6.7.2

3.2 Specification of Primary and Secondary Data

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ISO/ References
3.2.A	B	Effective January 1, 2026, the LCA(s) used for the PCR shall include a complete data quality assessment for both primary and secondary data, including the specification of which DQA method was used. *Note: EPA understands that completing a DQA may be an intensive task for the LCA practitioner tasked with conducting an LCA produced for the PCR. Further, if an existing reference LCA is being used instead of producing an LCA for the PCR, it may not be clear if a sufficient DQA is included. Additionally, given that there is no consensus on which DQA methodology should be used, it can be challenging to determine if a DQA that was previously conducted is sufficient, resulting in potential confusion and ambiguity in terms of data quality. To address this, and to help program operators, PCR committees and the LCA community, EPA has established a DQA Methodology.*[14] *EPA's DQA Methodology is not required for compliance with Criterion*	ACLCA 2-22; ISO 21930:2017 Clause 7.1.9; ISO 14044:2006 Clause 4.2.3.6; ISO 14025:2006 Clause 6.7.2; ISO/TS 14027:2017 Clause 6.2

[14] EPA's DQA Methodology is available for use by other dataset providers and users. More information on the DQA Methodology, and how the federal government is investing in improvements to free-to-use and publicly accessible datasets, can be found within Appendix A and on EPA's website.

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ISO/ References
		3.2.A, but it may be used to achieve compliance. The use of EPA's DQA Methodology will ensure compliance with Criterion 3.2.H (leadership). *To aid stakeholders, EPA can conduct a DQA upon request for any PCR that covers the United States and uses ISO 21930:2017 as its core PCR document, subject to available resources. Please reach out to embodiedcarbon@epa.gov with any questions.*	
3.2.B	B	Specific data (i.e., from upstream EPDs) that are representative of the raw material supply chain shall be used where possible. Where using specific data is not possible, PCRs shall prescribe free-to-use and publicly accessible secondary datasets. PCRs shall prescribe a unique free-to-use and publicly available secondary dataset for each of the following flows: • Electricity • Fuels • Transportation • Other unit processes in which secondary data are required by the PCR *Note: Effective January 1, 2026, PCRs shall prescribe the use of EPA-designated free-to-use and publicly available datasets for the flows identified within this criterion.*[15] *Prior to this date, PCRs that are being updated shall provide a commitment to use public datasets in the future if they are not already using public data. If a PCR uses private datasets, the PCR shall outline why public datasets are not adequate for the flows the PCR is seeking to model.*	This criterion addresses the considerations outlined in Appendix F on commercial terms in standards.

[15] EPA is actively working to improve free-to-use and publicly accessible datasets. At a minimum, this will include efforts relating to electricity, fuels and transportation flows. More information on how the federal government is investing in improvements to free-to-use and publicly accessible datasets can be found in Appendix A and on EPA's website.

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ISO/ References
3.2.C	B	For PCRs that cover geographic areas outside the United States or model processes that occur outside the geographic boundaries of the United States, the PCR committee shall propose appropriate secondary datasets for each specific geographic area or for technologies beyond the scope of the specified datasets for relevant supply chains.	ACLCA 2-18
3.2.D	B	PCRs that do not prescribe specific secondary datasets shall require that EPDs disclose the name, source reporting period, publication date and version associated with any secondary data used in the resulting EPD.	This criterion supports the disclosure of collected data for end-user comparability/verification.
3.2.E	B	Effective January 1, 2026, the PCR shall require that EPDs use facility-specific data for any upstream input that individually contributes 75% or more to the disclosed GWP-100 in the aggregated A1–A3 information modules,[16] as identified by the LCA produced for the PCR or reference LCA, unless no such specific data are available in the current market.	ACLCA 2-25
3.2.F	B	Effective January 1, 2026, the PCR shall provide conservative[17] default values (including supporting justification from the LCA produced for the PCR) for scenario data of the specified processes where no data are available for the EPD developer. No values should be left blank or n/a (not applicable).	ACLCA 2-28

[16] The term "GWP" is used in EPDs, PCRs, and Buy Clean policies for construction products as an impact category to report on embodied GHG emissions (per ISO 21930:2017, Section 7.3, Table 5). In the ISO context, "GWP" is conveyed in CO_2e/unit of product/material to denote the product level GHG emission intensities. We note this usage is inconsistent with how GWP is defined by the Intergovernmental Panel on Climate Change (IPCC) and in other GHG accounting efforts, including national reporting by Parties to the Paris Agreement. Per IPCC, GWP is an index measuring the radiative forcing following an emission of a unit mass of a given substance, accumulated over a chosen time horizon, relative to that of the reference substance, carbon dioxide (CO_2). For more information on the definition and use of the term, "GWP" (Global Warming Potential), please see https://www.epa.gov/ghgemissions/understanding-global-warming-potentials.

[17] A conservative default value is one in which the PCR committee selects the worst yet realistic value after evaluating all available data (from domain-specific experience and results from the LCA produced for the PCR or referenced).

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ISO/ References
3.2.G	B	The PCR shall outline a list of primary data sources, secondary data sources and default LCIA method(s) such that it is clear which flows are to be modeled using which data source. This should take the form of a chart for end users to read and apply. EPA recommends including a chart with the characteristics shown in Table G-1 of Appendix G.	ACLCA 2-31, Appendix G
Section 3.2—Leadership Criteria			
3.2.H	L	The LCA produced for the PCR should include a complete DQA for both primary and secondary data using EPA's DQA Methodology.	ACLCA 2-22; ISO 21930:2017 Clause 7.1.9; ISO 14044:2006 Clause 4.2.3.6; ISO 14025:2006 Clause 6.7.2; ISO/TS 14027:2017 Clause 6.2
3.2.I	L	The PCR should require the inclusion of a data source disclosure chart for EPDs such that it is clear which flows were modeled using which data source (i.e., a specific secondary set). This should take the form of a chart for end users to read and apply. EPA recommends including a chart with the characteristics shown in Table G-2 of Appendix G. *Note: This chart should not include confidential information, and should only list the data source, such as a product- and facility specific EPD, or a specific secondary dataset.*	This criterion will aid in comparability of EPDs by ensure that EPDs reflective of products that meet the same functional use can be compared through aligned data sources for the foreground system modeling.
3.2.J	L	The PCR should require that EPDs use facility-specific data for any upstream input that individually contributes 50% or more to the disclosed GWP-100 in the aggregated A1–A3 information modules,[18] as identified by the LCA produced for the PCR the underlying or reference LCA that supports and aligns with the scope of the PCR, unless no such specific data are available in the current market.	ACLCA 2-25

[18] See footnote 16.

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ISO/ References
3.2.K	L	The PCR should identify and prescribe relevant upstream PCRs for use in the modeling of impact of constituent products within the scope of the PCR being establish and/or updated.	This criterion will help aid the upstream and downstream harmonization of PCRs.

3.3 Facility Emission Data Specification

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ References
3.3.A	B	Effective January 1, 2026, the PCR shall specify that industry average EPDs shall follow ISO 21678:2020 for reference values type of benchmark and shall, at a minimum: a. Include the minimum scope of life cycle stages required by the PCR, and provide the data by informational modules separately (e.g., A1, A2, A3). b. Define similar product types[19] and provide the rationale for such product types within the product category. c. Discuss market coverage for representativeness. d. Where feasible and practical, benchmarks should be production volume weighted, in other words, reflect a combination of the LCIA indicators of a product and the amount of the product used. It is recommended to use and average from one to three years of production volumes. e. Include a statistical analysis, including the mean, standard deviation, median, quintile distribution, level of confidence (including margin of error), and confidence interval for the LCIA indicators outlined in Table 5 of ISO 21930:2017. This would include the number of data points (sample size) used in the calculation of the statistical analysis per product type identified. Additionally, the industry average EPD should explicitly state which statistical distribution (e.g., normal, exponential) is being used to derive the confidence interval and a justification for use of that distribution. The industry average EPD should also include a description of the effect of any missing data on the results. The PCR shall include the methodology for developing industry average EPDs that addresses how collected data from participating parties are to be aggregated using	ISO 21678:2020; ISO 21930:2017, Clause 5.2.1, 7.3, Table 5 This criterion helps ensure a standardized industry average methodology across sectors. This supports public agency staff working with multiple materials within a construction project.

[19] Similar product types are defined as materials/products within the same product category (e.g., concrete, glass, asphalt mixture, steel) that meet the same requirements (function and/or performance). Product category refers to the group of construction products, construction elements, or integrated technical systems covered under the PCR.

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ References
		a weighted average (vertical or horizontal) approach. Any disaggregation of impact indicators regionally should be accompanied in the industry average EPD with an explanation on how regional boundaries were determined.	
3.3.B	B	The PCR shall provide guidance on how to cover purchasing and use of EACs, specifically for procuring electricity via RECs for facility emissions reporting. As part of the PCRs guidance, the PCR may also, but is not required to, consider the following: a. Determine the renewable share at the corporate, facility or product level. b. Identify the facility/facilities and product(s) to apply contractual instruments to and determine annual production volumes. c. Determine whether the contractual instrument is applicable. d. Use a balance sheet to allocate contractual instruments to annual production. e. Model allocated electricity covered by RECs. f. Model allocated electricity not covered by RECs using a consumption grid. g. Retire the RECs and ensure the reported GWP[20] does not differ more than 10% for the duration of the EPD validity. The PCR may consider following Criterion 3.3.F and Appendix D from EPA, or ACLCA's Guidance for Quantifying Renewable Electricity Instruments in Environmental Product Declarations (EPDs) from May 2023.	ACLCA's Guidance for Quantifying Renewable Electricity Instruments in Environmental Product Declarations (EPDs) from May 2023

[20] See footnote 16.

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ References
Section 3.3—Leadership Criteria			
3.3.C	L	The PCR should require the EPD to disclose the ENERGY STAR Energy Performance Score in the additional environmental information section of the EPD when an Energy Performance Indicator is available for the manufacturing plant(s) in which the product or constituent upstream product was manufactured. *Note: See Appendix C for recommended text to include in PCRs to address this criterion.*	ACLCA 2-25 For more information on how the ENERGY STAR Score differs from embodied carbon visit the consult the ENERGY STAR Energy Performance Score Fact Sheet. For information on how to obtain a score visit www.energystar.gov/epis.
3.3.D	L	If facility-specific data are not available for the upstream unit processes, and such a facility is required to report to EPA's GHGRP, The PCR should require the EPD to disclose in its additional environmental information section the carbon intensity of the manufacturing plant (e.g., GHGs emitted per metric ton of product manufactured) from which the product types, and/or the quartile[21] in which the manufacturing plant resides. Carbon intensity shall be calculated by dividing the emissions reported to EPA's GHGRP by plant production. Emission and production data must be from the same reporting period using the most recent year of data.	ACLCA 2-25

[21] Quartile benchmarks exist for the following materials:

- Cement: https://www.epa.gov/system/files/documents/2021-10/cement-carbon-intensities-fact-sheet.pdf
- Flat glass: https://www.epa.gov/system/files/documents/2022-06/2019%20Flat%20Glass%20Plant%20Carbon%20Intensities%20Fact%20Sheet.pdf
- Fiberglass insulation: https://www.epa.gov/system/files/documents/2022-06/2019%20Fiberglass%20Plant%20Carbon%20Intensities%20Fact%20Sheet%20.pdf

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ References
3.3.E	L	The PCR should require that the pre-consumer and post-consumer recycled content of a product be separately disclosed in the EPD. Further, the PCR should require that the allocation method used for recycling be disclosed in the EPD. *Note: See Appendix H for recommended text to include in PCRs to address this criterion.*	ISO 21930:2017, Clause 7.2.4, 7.2.6; ASTM E3199-22; See Appendix H for more information.
3.3.F	L	The PCR should provide guidance on how to cover purchasing and use of EACs, specifically for procuring electricity via RECs for facility emissions reporting. PCRs should require that: • For manufacturing plants located in the United States, only EACs generated from sources in the United States may be used. • EACs accounted in the LCA must be the same reporting period as the reporting period for other energy data. • EACs come from generators that were placed into service within the past 15 years. • The electricity accounting methodology (location-based versus market-based) be disclosed on the EPD when presenting the LCA results. • A manufacturer must attest in writing that EACs allocated to a particular facility or product have and will not be sold or transferred after a claim has been made. A manufacturer must document controls it has put in place to manage EAC allocation within its operating boundary. • In cases where EACs are retired on behalf a specific facility or for a manufacturing process within a facility, an EAC retirement report, which references the manufacturing facility's name, must be produced which references the manufacturer's name in the retirement report and documentation related to the EAC allocation within the manufacturers operational footprint must be produced and verified.	See Appendix D for more information on EACs and RECs.

Criteria #	B/L	Criterion	ACLCA PCR Guidance/ References
		• EAC-based electricity must use LCI data based on the same LCI models used for grid electricity. Facility-specific generation models should be employed to match the carbon intensity of the EAC electricity generators. If facility-specific models are not available, regional models of the same energy source generation type may be used. The same values for grid line losses used in the electricity grid LCI shall be applied to EAC-based electricity LCIs. • The EPD verifier must verify that the manufacturer owns the EACs and has not sold or transferred them after a claim against them has been made. • EACs with Green-e certification (or another EPA-approved EAC certification) must be used when EACs are included in the calculation of life cycle impacts.	

Appendix A: Overview of EPA's Efforts to Improve Free-to-Use and Publicly Accessible Secondary Datasets within the United States

Throughout EPA's PCR Criteria, there are multiple references to the use of free-to-use and publicly accessible secondary datasets for PCRs that cover the United States. As part of this effort, EPA has outlined the risks associated with the use of proprietary datasets (see Appendix F of this document). While these challenges are present, so are the concerns associated with the existing state of free-to-use and publicly accessible secondary datasets, primarily in reference to those found within the U.S. Federal LCA Commons. As part of EPA's efforts to implement Sections 60112 and 60116 of the Inflation Reduction Act of 2022, EPA is committed to improving and directly investing in free-to-use and publicly accessible datasets for reference in PCRs. These efforts have already begun over the course of 2024, with EPA undertaking multiple different efforts to address the existing data gaps and useability concerns associated with the FLCAC. As such, EPA is providing multiple documents (many of which are referenced within the PCR Criteria) to aid in the outline of efforts that EPA is taking, and efforts relating to data quality within PCRs. All the documents listed below are published on EPA's website and will provide context for efforts associated with the improvement of the FLCAC.

- *A Vision and Plan to Improve Secondary Life Cycle Assessment Data Used in Environmental Product Declarations*
- *Memorandum of Understanding Among the U.S. Department of Energy (DOE), U.S. Environmental Protection Agency (EPA), U.S. Department of Agriculture (USDA), U.S. Department of Transportation (DOT), and the National Institute of Standards and Technology (NIST) on the Federal Life Cycle Assessment (LCA) Commons*
- *Life Cycle Inventory Data Gap Assessment*
- *Data Quality Assessment Method for Secondary Data to Support the Label Program for Low Embodied Carbon Construction Materials (Version 1) (EPA's DQA Methodology)*
- *Data Quality Assessment Method Template (Version 1)*
- *Product Category Rule Standards and Related Initiatives*

Appendix B: List of Criteria

Baseline List of Criteria	Baseline, Effective January 1, 2026	Leadership
1.1.A	1.2.B (see note)	1.1.I
1.1.B	1.2.C (see note)	1.1.J
1.1.C	1.2.D (see note)	1.1.K
1.1.D	3.2.A	1.2.E
1.1.E	3.2.B (see note)	1.2.F
1.1.F	3.2.E	1.2.G
1.1.G	3.2.F	2.1.O
1.1.H	3.3.A	2.1.P
1.2.A		3.1.D
1.2.B		3.2.H
1.2.C		3.2.I
1.2.D		3.2.J
2.1.A		3.2.K
2.1.B		3.3.C
2.1.C		3.3.D
2.1.D		3.3.E
2.1.E		3.3.F
2.1.F		
2.1.G		
2.1.H		
2.1.I		
2.1.J		
2.1.K		
2.1.L		
2.1.M		
2.1.N		
2.2		
3.1.A		
3.1.B		
3.1.C		
3.2.B		
3.2.C		
3.2.D		
3.2.G		
3.3.B		

Appendix C: Recommended Text Associated with ENERGY STAR

The U.S. EPA's ENERGY STAR program facilitates several activities recognizing companies and plants that have noteworthy accomplishments in managing and reducing energy use in their operations. Reducing energy use is a primary method of reducing carbon dioxide emissions, particularly if on-site fuel consumption is minimized. EPA recommends the following text be included in PCRs:

Recommended Text Associated with Criterion 1.1.I

Plant Certification

The U.S. Environmental Protection Agency (EPA) provides ENERGY STAR certification to manufacturing plants that are the most energy efficient plants in their sector. An http://www.energystar.gov/plants is in the top quartile of energy efficiency, when compared to similar plants and often emits less carbon dioxide than similar plants. ENERGY STAR Certified Plants are subject to additional criteria defined in the ENERGY STAR program and verification by EPA.

An EPD may indicate whether a plant in the associated product's supply chain has achieved Plant Certification within the allowable EPD data collection period. The following information shall be provided:

- *Plant name and location.*
- *The year(s) in which the refinery achieved ENERGY STAR certification.*
- *Website link to a www.epa.gov or www.energystar.gov webpage that shows whether a plant has achieved ENERGY STAR certification. The recommended link at the time of publishing this PCR is https://www.energystar.gov/buildings/certified_buildings_and_plants.*

Challenge for Industry

The ENERGY STAR http://www.energystar.gov/industrychallenge recognizes manufacturers that have achieved a reduction of 10 percent or more in energy intensity within a five-year period.

An EPD published under this PCR may indicate that the manufacturing plant(s) has achieved the ENERGY STAR Challenge for Industry within the allowable EPD data collection period. If so, the following information shall be provided:

- *Facility name and location.*
- *The year in which the Challenge for Industry was achieved.*
- *The percent reduction in energy intensity that was achieved.*
- *Website link to www.epa.gov or www.energystar.gov webpage that shows whether a plant has achieved the Challenge for Industry. The recommended link at the time of publishing this PCR is https://www.energystar.gov/industrial_plants/earn-recognition/energy_star_challenge_industry2/challenge-achieved.*

Partner of the Year Award

U.S. EPA Partner of the Year Award recipients are businesses recognized by EPA for having made outstanding contributions to protecting the environment through superior energy efficiency

achievements, documented proven energy savings, and established a corporate energy management program that encompasses key elements identified by ENERGY STAR.

An EPD published under this PCR may indicate that the company that owns the manufacturing plant(s) has achieved the ENERGY STAR Partner of the Year Award within the allowable EPD data collection period. The following information may be provided:

- *The year(s) in which the ENERGY STAR Partner of the Year Award was achieved.*
- *Website link to a www.epa.gov or www.energystar.gov webpage that shows whether a company has achieved the Partner of the Year Award. The recommended link at the time of publishing this PCR is https://www.energystar.gov/about/how-energy-star-works/our-partners/awards.*

Recommended Text Associated with Criterion 3.3.C

ENERGY STAR Score

EPA has developed ENERGY STAR Energy Performance Scores to benchmark the energy efficiency of certain manufacturing plants. Energy Performance Scores measure how energy efficient a manufacturing plant's operations are when compared to similar plants and uses a 1–100 scale to score the plant's energy performance. A score of 50 reflects average performance, 1 reflects lowest performance, and 100 reflects highest performance.

The ENERGY STAR Score must be reported for the [select all that are applicable to the product's supply chain: integrated steel mill, flat/float glass manufacturing facility, cement plant, [and] asphalt mix plant] in the product's supply chain using the following format:

- *Name and location of manufacturing plant: [name of manufacturing plant; city, state]*
- *ENERGY STAR Score: [##]*
- *Reporting period: [month/year–month/year]*
  - *ENERGY STAR Scores are based on 12 consecutive months of energy- and production-related data. This field discloses the 12-month period of data used to determine the ENERGY STAR Score. The reporting period, to the extent possible, should align with the data period used for producing the EPD or include a more recent 12-month period.*
- *EPI model version: [version x.x year]*
  - *The model used to calculate ENERGY STAR Scores is periodically updated. Include the version number found at the top of the Energy Performance Indicator used to calculate the score.*
- *ENERGY STAR Certification (if applicable): [Certification year(s)]*

Note: At the time of publication, EPIs are available for integrated steel mills, float/flat glass manufacturing plants and cement plants. An EPI is being developed for asphalt mix plants. This section will be updated as EPIs are developed for additional industrial sectors.

For more information on how to obtain a score visit the webpage: https://www.energystar.gov/industrial_plants/measure-track-and-benchmark/energy-star-energy For more information on how the ENERGY STAR Score differs from embodied carbon visit the webpage: *https://www.energystar.gov/buildings/tools-and-resources/disclosing-energy-star-score-low-embodied-carbon-programs*

Appendix D: Additional Information on EACs and RECs

Technical Considerations

Energy attribute certificates are contractual instruments that convey information (i.e., attributes) about a unit of energy, including the resource used to create the energy and the emissions associated with its production and use.[22] EACs can take a variety of forms, including renewable energy certificates, zero-emissions credits and renewable thermal certificates. EACs are used throughout the renewable energy economy to substantiate claims related to corporate GHG reporting, contractual mechanisms for renewable electricity purchases (e.g., power purchase agreements) and other programs.

Note that these criteria are written in the context of renewable electricity and the related energy instruments, such as RECs, used in the U.S. market to verify contractual claims of electricity use. The criteria do not address the use of EAC applications related to direct fuel use or non-renewable sources of energy.

The Greenhouse Gas Protocol is a widely accepted international framework for emissions accounting. The protocol comprises a set of standards and guidance also known as scope 2, and includes guidance on accounting for emissions associated with purchased electricity. Under the protocol's scope 2 guidance, companies are required to account for their emissions using two separate methods, referred to as dual reporting.[23] The first method, the location-based method, seeks to account for a company's emissions based on where the company's electricity consumption occurs. The second method, the market-based method, seeks to account for emissions associated with the contractual choices a company makes for specified sources of electricity. The market-based method relies on market-based instruments, such as EACs, to verify a consumer's contractual procurement of electricity from specified resources. EACs are an internationally accepted mechanism for allocating generation across a shared electricity grid and for representing the emissions associated with electricity. In other countries, EAC instruments may be referred to by different names. For example, a REC is a type of EAC produced from renewable resources.

The type of accounting methodology used determines the amount of embodied carbon disclosed in an EPD and the data on which public agencies will base decisions. LCAs and EPDs have only recently started following the conventional approach of using location-based accounting of electricity emissions. The demand for lower embodied carbon materials has prompted the market to consider additional pathways, including procuring renewable electricity, to distinguish their products and account for their investments in carbon disclosures. While standards and guidance exist for reporting renewable electricity at the organizational level, there has been less focus on developing an approach for incorporating renewable electricity into LCAs.

[22] An EAC is a contractual instrument that conveys information (attributes) about a unit of energy, including the resource used to create the energy and the emissions associated with its production and use. For more information, see https://www.epa.gov/green-power-markets/energy-attribute-certificates-eacs and https://www.epa.gov/system/files/documents/2024-02/energy_attribute_certificates.pdf.

[23] Sotos, M. (2015). Section 1.5.1: New Reporting Requirements. In: GHG Protocol Scope 2 Guidance. World Resources Institute. https://ghgprotocol.org/scope-2-guidance.

EPA is supportive of current efforts to create renewable electricity guidelines for PCRs. ACLCA provides guidance in its Open Standard addendum on *Quantifying Renewable Electricity Instruments in Environmental Product Declarations*.[24] This addendum is being updated.

EPA has assessed current guidelines and prescribed additional requirements to ensure the methodological integrity of incorporating market-based accounting in LCAs that support EPDs for EPA's label program. These criteria are outlined in sections 1.1.I, 3.3.B and 3.3.F of EPA's PCR Criteria. This appendix provides additional context and justification for these criteria.

In the long term, EPA envisions a standard and an accompanying conformity assessment protocol for using EACs that informs market-based electricity accounting approaches in product-level LCAs. As the practices for accounting for renewable electricity evolve, the standards related to EPDs will also have to evolve. For example, a standard would need to consider the emerging trend toward more granular matching of generation to consumption through schemes such as 24/7 hourly matching.[25]

In the interim, for methodological consistency within PCRs and EPA's label program, a consistent approach should be used when calculating electricity emissions.

Criteria from Section 3.3.F

Practices for calculating renewable electricity in EPDs are expected to conform with corporate accounting standards, scope 2 guidance, and best practices when applicable.

Purchase of Electricity Within Market Boundaries

- ***Criterion***: For manufacturing plants located in the United States, only EACs generated from sources in the United States may be used.
- ***Justification***: EPA expects that EACs will be generated in the same market where electricity consumption occurs. Furthermore, EPA expects that the market boundary will be defined based on a regulatory and legal basis that prevents double counting. Currently, some programs and policies define North America as a single market, including the ACLCA Open Standard (Section 2.2.1 of *Quantifying Renewable Electricity Instruments in Environmental Product Declarations*). However, unlike the European Union and its member states,[26] the United States, Canada and Mexico do not have a compact in place to provide reciprocal acknowledgement of EACs across national boundaries. The lack of reciprocal acknowledgement presents a potential for double counting. Therefore, EPA expects that manufacturers only purchase EACs from within the United States to serve consumption occurring in the United States. This conforms with EPA's interpretation of international standards and guidance related to scope 2 accounting[27] of purchased electricity as well as other federal policy positions.[28] Trends in the market indicate

[24] American Center for Life Cycle Assessment. (2023). Guidance for Quantifying Renewable Electricity Instruments in Environmental Product Declarations (EPDs). https://aclca.org/wp-content/uploads/2022-ACLCA-PCR-Open-Standard_Addendum_Quantifying-Renewable-Electricity-Instruments-in-EPDs_FINAL_061323.pdf.
[25] U.S. EPA. (February 6, 2024). 24/7 Hourly Matching of Electricity. https://www.epa.gov/green-power-markets/247-hourly-matching-electricity.
[26] European Union members are directed through the Measuring Instruments Directive (MID) and European standards that define the cooperation between European member states. https://single-market-economy.ec.europa.eu/single-market/european-standards/harmonised-standards/measuring-instruments-mid_en and https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32019L0944&qid=1721059062914.
[27] International standards and guidance: https://ghgprotocol.org/scope-2-guidance.
[28] Federal policy positions: https://www.epa.gov/sites/default/files/2020-12/documents/electricityemissions.pdf and https://www.epa.gov/sites/default/files/2016-01/documents/gpp_partnership_reqs.pdf.

that generation matched to consumption on a geographical basis may become more narrowly aligned within international accounting and reporting standards, which would require future adjustments under this requirement.

Temporal Reporting Eligibility of Generation Matched to Consumption

- ***Criterion:*** EACs accounted for in the LCA must have the same reporting period as the reporting period for other energy data.
- ***Justification:*** The GHG Protocol Scope 2 Guidance explains that the contractual instruments used shall "be issued and redeemed as close as possible to the period of energy consumption to which the instrument is applied."[29] For EPDs, EPA expects that electricity reported under a 12-month reporting period must be generated during that reporting period. Trends in the market indicate that electricity generation and consumption should match with regard to when and where they occurred.

Vintage Eligibility of Generators

- ***Criterion:*** EACs come from generators that were placed into service within the past 15 years.
- ***Justification:*** EPA expects that all generation comes from generators that were placed into service within the past 15 years. This expectation aligns with the ACLCA renewable electricity addendum and Green-e Framework for Renewable Energy Certification.[30] This eligibility period supports a term of contract that allows projects and project investors ample time to recoup their investments through a supply contract. Standards that are developed to address EACs in LCAs may establish a newer generator vintage date. However, these standards should consider a grandfathering clause beyond the eligibility date such that the generation in the out years of the contract is eligible for the manufacturer. Trends in the market suggest that the eligibility of vintage generators may also change as the term for a return on investment decreases, which would require future adjustments under this requirement.

Disclosure of Accounting Methodology

- ***Criterion:*** The electricity accounting methodology (location-based versus market-based) shall be disclosed on the EPD when presenting the LCA results.
- ***Justification:*** There is no standardized terminology used in EPDs for characterizing the methodology when EACs are or are not accounted for in the calculation of LCI results. To align with other accounting methodologies, EPA recommends that the terms "location-based" and "market-based" accounting be used. These terms should be used on the EPD to describe the electricity accounting methodology used. Definitions are as follows:
- ***Location-based accounting:*** A method to quantify scope 2 GHG emissions[31] based on average energy generation emission factors for defined locations, including local, subnational or national

[29] World Resources Institute. (2015). Greenhouse Gas Protocol Scope 2 Guidance: An Amendment to the Greenhouse Gas Protocol Corporate Standard. https://ghgprotocol.org/sites/default/files/2023-03/Scope%202%20Guidance.pdf.
[30] Green-e. (2017). Green-e Framework for Renewable Energy Certification. Version 1.0. https://www.green-e.org/docs/energy/framework/Green-e%20Framework%20for%20Renewable%20Energy%20Certification.pdf.
[31] "Scope 2 emissions" refers to the indirect emissions from a reporting entity's generation and consumption of purchased or acquired electricity, steam, heat or cooling.

boundaries. This definition is consistent with the one in the Scope 2 Standard of the GHG Protocol.

- ***Market-based accounting:*** A method to quantify scope 2 GHG emissions based on GHG emissions emitted by the generators from which the reporter contractually purchases electricity bundled with instruments, or unbundled instruments on their own. This definition is consistent with the one in the Scope 2 Standard of the GHG Protocol.

All purchased electricity used in corporate manufacturing activities should align with the electricity purchased and reported under scope 2 corporate accounting practices.

Allocation Documentation

- ***Criteria:*** A manufacturer must attest in writing that EACs allocated to a particular facility or product have not been and will not be sold or transferred after a claim has been made. A manufacturer must document controls it has put in place to manage EAC allocation within its operating boundary.
- ***Justification:*** The ACLCA renewable electricity addendum requires that LCA reports include a balance sheet to allocate contractual instruments to annual production. It permits EACs to be to the entirety or a portion of a facility's production volume. EPA will be developing a white paper on best practices in allocating EACs within a corporate footprint and verification recommendations, which can enhance existing EAC accounting efforts. Because corporations often buy renewable electricity at a corporate level, a credible and transparent process for allocating EACs within a corporate operational footprint will be necessary and to avoid double counting. EPA also recommends the creation of a standard and accompanying conformity assessment protocol for using EACs that inform market-based electricity accounting approaches in product-level LCAs. In the interim, manufacturer allocation procedure documentation provides transparency and a paper trail outlining EAC allocation. Such documentation should explain how an organization will guarantee that the EACs being attributed to a product in the EPD will not be attributed to other products or activities and describe what internal accounting controls have been put in place.

Facility-Specific Allocation

- ***Criterion***: In cases where EACs are retired on behalf a specific facility or for a manufacturing process within a facility, an EAC retirement report, which references the manufacturing facility's name, must be produced. Documentation related to the EAC allocation within the manufacturer's operational footprint must also be produced and verified.
- ***Justification:*** An organization owns an EAC, and EACs are retired by organizations, not products. EAC retirement reports can indicate whether the EAC was retired for a particular facility.[32] These retirement reports are not set up to indicate whether they are associated with a particular product. In the interim, manufacturers who intend to include EACs in embodied carbon accounting are expected to name the facility as part of the retirement process. Tracking systems provide customizable "notes" fields so users can identify the intent of allocation in an EAC

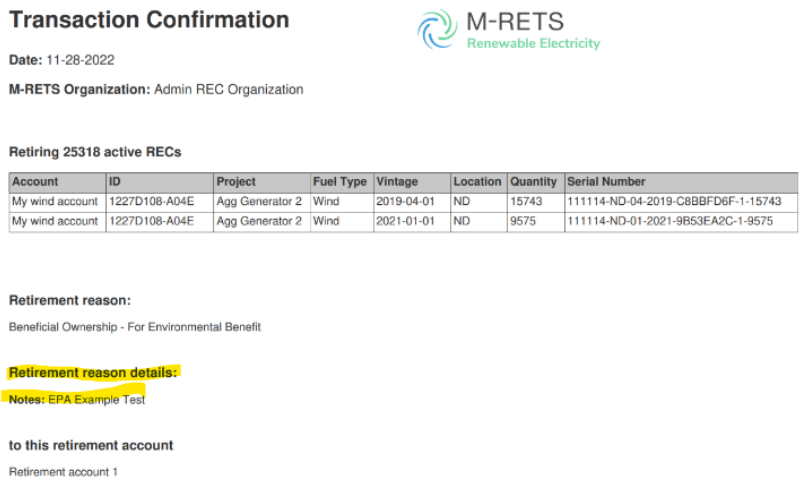
[32] Procurement of clean electricity through retail programs, products or tariffs may not be able to produce retirement reports that allocate specific EACs to customers or verify retirement to a specific manufacturer facility. In these cases, purchasing third-party-certified products ensures that the manufacturer has had EACs retired on its behalf. In some cases, the verification and allocation of EACs may need to be documented outside of EAC tracking system reports.

retirement report. EAC ownership and retirement can be demonstrated through the following means:

- A purchase contract between the supplier and the manufacturer detailing conveyance or ownership of the associated EACs (if the EACs are not self-generated)
- A tracking system EAC retirement report that includes:
  - Documentation that the EACs were retired for the manufacturer
  - A notation in the tracking system of the EAC's intended allocation to the manufacturer's operational footprint

Tracking system retirement processes provide a field for the EAC owner to indicate the "retirement reason," which can be used for naming the facility. This field is editable. See an example of this field in Figure D-1 below.

If the intended allocation of EACs cannot be noted in the retirement report, the manufacturer will have to provide this documentation separately, including EAC unique identification numbers, so a verifier can ensure that EACs are not double claimed.



Transaction Confirmation

M-RETS
Renewable Electricity

Date: 11-28-2022

M-RETS Organization: Admin REC Organization

Retiring 25318 active RECs

Account	ID	Project	Fuel Type	Vintage	Location	Quantity	Serial Number
My wind account	1227D108-A04E	Agg Generator 2	Wind	2019-04-01	ND	15743	111114-ND-04-2019-C8BBFD6F-1-15743
My wind account	1227D108-A04E	Agg Generator 2	Wind	2021-01-01	ND	9575	111114-ND-01-2021-9B53EA2C-1-9575

Retirement reason:

Beneficial Ownership - For Environmental Benefit

Retirement reason details:

Notes: EPA Example Test

to this retirement account

Retirement account 1

Figure D-1. Example EAC Retirement Report.

Aligning with an LCI

- ***Criteria:*** EAC-based electricity must use LCI data based on the same LCI models used for grid electricity. Facility-specific generation models should be employed to match the carbon intensity of the EAC electricity generators. If facility-specific models are not available, regional models of the same energy source generation type may be used. The same values for grid line losses used in the electricity grid LCI shall be applied to EAC-based electricity LCIs.
- ***Justification:*** An EAC retirement report is not formatted to contain all the relevant information to be consumable in an LCA. As such, a protocol for associating the carbon intensity of an EAC to an LCI is needed to ensure consistent application of EACs within LCAs.

Verification of Consumed Generation

- ***Criterion:*** The EPD verifier must verify that the manufacturer owns the EACs and has not sold or transferred them after a claim against them has been made.
- ***Justification:*** Manufacturers making private investments in renewable electricity sources should be able to claim those private investments in specified electricity sources using available market-based accounting approaches. EPA expects that a manufacturer's claims of consumption from specific generating sources must be verified and validated with EACs and reviewed by an impartial third party involved in the verification of the EPD. This expectation aligns with international standards and practices, such as the GHG Protocol, and meets U.S. Federal Trade Commission guidance related to commercial marketing claims around the sale and use of renewable electricity.[33] The EPD verifier must verify that the manufacturer owns the EACs and has not sold or transferred them after a claim against them has been made. This can be demonstrated through the review of a clean electricity procurement contract supported by an EAC retirement report. EAC tracking registries can also verify manufacturer EAC retirement and claims. The documentation must match the assumed fuel pathways of the underlying LCA analysis. The LCA verifier must also consider adding to the LCA report the circumstances (such as increased electricity demand) under which the manufacturer must update the EPD to account for a potential change in embodied carbon results.

Green-e

- ***Criteria:*** EACs with Green-e certification (or another EPA-approved EAC certification) must be used when EACs are included in the calculation of life cycle impacts.
- ***Justification:*** Green-e–certified EACs[34] ensure that the manufacturer is claiming use of generation from resources that meet national standards for quality and content, the certifier has validated that the purchase is backed by contracts, and EAC retirement has been executed. For certain supply pathways related to retail renewable electricity programs and products, Green-e certification is particularly important because an electricity content label is required to validate specific fuel inputs to the LCA. EPA recommends Green-e as a consumer best practice. EPA's ENERGY STAR Next Gen label, which has renewable energy procurement criteria, recognizes Green-e as a pathway to validate the environmental attributes of RECs being applied to the label.[35] Manufacturers can also have bilateral, project-specific contracts certified under Green-e Direct.

The next section of this appendix presents a set of questions that procurement agencies and users of EPA's label program can ask EPD generators.

[33] Federal Trade Commission. (October 11, 2012). Guides for the Use of Environmental Marketing Claims. https://www.ftc.gov/sites/default/files/attachments/press-releases/ftc-issues-revised-green-guides/greenguides.pdf.
[34] Center for Resource Solutions. (July 7, 2017). Green-e Framework for Renewable Energy Certification. Version 1.0. https://www.green-e.org/docs/energy/framework/Green-e%20Framework%20for%20Renewable%20Energy%20Certification.pdf.
[35] U.S. EPA. (April 2024). Technical Reference: ENERGY STAR NextGen GHGi Targets. https://www.energystar.gov/sites/default/files/2024-04/Updated_Technical_Reference_NextGen_04222024%20508C.pdf.

Recommended Questions for Verifying and Auditing EPDs with EACs and Improving Future Guideline Development

The following are recommended topics that an EPD or LCA verifier could include as part of their verification of an EPD or LCA. These questions can also be used by a procurement program to audit renewable energy procurement practices if the manufacturers are the same as those used to produce an EPD submitted to their program. These questions are being provided for reference only and are not a part of the baseline or leadership criteria.

- Obtain a copy of the LCA Report associated with the EPD.
  - Per ISO 14025: 2006, "the independent verifier shall generate a report documenting the verification process, while adhering to the obligations of 8.3 covering rules for data confidentiality. This report shall be available to any person upon request."
- Confirm the inclusion of Table 3 from the ACLCA Open Standard addendum. See Figure D-2.
- In addition, verify the following information:
  - The legal entity that procures and claims the EACs with electricity consumption is the same as the entity reflected on the EPD.
  - If EACs are allocated at the facility level, the facility name is noted in the EAC retirement report.
  - The start and end dates of the 12-month period of reported energy consumption used in the LCA align with the retirement report.
  - That EACs come from generators that were placed into service within the past 15 years.
  - Whenever the GWP[36] is presented on an EPD, there is a note explaining whether location-based or market-based accounting is used.
  - EAC generation aligns with the same 12-month reporting period as electricity consumption.
  - The reported generation of the EAC is from the same market as where electricity consumption occurs. The maximum interpretation of the market boundary is the United States.
  - The resource mix of a retail contract, between the "promise" and "actual" certification product labels, has a variance of no more than 5 percent. This aligns with the Green-e National Standard.
  - Whether a reserve buffer to accommodate variable generation of overproduction and underproduction exists.
  - The proportion of EACs allocated to the specified manufacturing facility and product aligns with the prescribed allocation methodology.
  - EACs are Green-e certified, or another EPA-approved EAC certification is used.
  - EAC-based electricity uses LCI data based on the same LCI models used for grid electricity.
  - For any portion of electricity not covered by EACs, the LCI was used for modelling consumption as appropriate.

[36] See footnote 16.

- The methodology the organization follows for allocating EACs across its plant and product portfolio is documented and appropriate.
- The organization explains how it will guarantee that the EACs being attributed to the product in the EPD will not be attributed to other products or activities. For example, an organization should explain whether internal accounting mechanisms and controls have been put in place.
- Written documentation that the manufacturer will not allocate EACs to a particular facility or product has not been and will not be sold or transferred after a claim has been made.
- The percentage of electricity consumed at the plant that is covered by EACs relative to total annual electricity consumption of the plant is the same as the percentage in the published EPD (if validating that renewable energy procurement practices have remained the same after an EPD was published).

Ask the manufacturer to provide evidence that 1) the energy procurement contract with the vendor was in effect for the energy and production data reporting period for conducting the LCA, 2) the contract is in delivery status, and 3) the EACs have been retired for the reporting period of the EPD through the present.

Ask the manufacturer to provide an EAC retirement report with a description of the allocation of EACs within the corporate footprint to a particular facility and product line.

On an annual basis (or set schedule determined by the program), confirm that the purchase and allocation of EACs proportional to production volume corresponds to the amounts and approach used to allocate the EACs in the published EPD.

Table 3. Renewable energy certificate details for inclusion in the LCA background report

Renewable energy certificate technical scenario		
Parameter	**Unit**	**Value**
Renewable generator project name:		
Tracking system ID (unique generator ID):		
Renewable facility/generator owner:		
Renewable facility/generator location:	State / province	
Project vintage (build date):	Year	
Project generation date (year first produced renewable energy):	Year	
Nameplate capacity of project:	MW	
Certificate type:		
Certificate unique ID:		
Month and year of renewable energy generation:	Month / year	
Month and year certificate issued:	Month / year	
Utility to which the project is interconnected:		

Figure D-1. Example EAC Retirement Report.

Appendix E: EPA's Recommended PCR Reviewer and EPD Verifier Qualifications

EPA is establishing recommendations for PCR reviewer and EPD verifier qualifications. These qualifications include independence and relevant competencies, such as industry- and product-specific knowledge and knowledge of relevant standards related to LCA and EPDs. These recommendations align with the requirements of ISO 14025:2006. Program operators responsible for developing PCRs and/or EPDs are encouraged to adopt these recommended qualifications within their General Program Instructions.

PCR Review Panel Qualifications

The PCR review panel shall be made up of at least three independent external experts. An independent external expert is a competent person who is not employed (full-time or part-time) with the program operator responsible for developing the PCR. The chair of the PCR review panel shall also be independent of the industries producing and supplying the products covered by the product category or their suppliers.

The combined competencies of the PCR review panel should include knowledge and proficiency in:

- Product and product-related environmental aspects for the relevant sector.
- LCA methodology and practice.
- The relevant standards in the fields of environmental declarations and LCA (i.e., ISO 14025:2006, ISO/TS 14027:2017, ISO 14040:2006, ISO 14044:2006, ISO/TS 14071:2014 and ISO 21930:2017).
- The regulatory framework within the scope of the PCR.
- The EPD program(s) in which the PCR is intended to be used.

The program operator shall require each PCR review panel member to have a signed self-declaration of reviewer independence and competencies (see example declaration on the next page).

Example Declaration for PCR Review Panel Member

I, the signatory, hereby declare that:

- *I am not a full-time or part-time employee of the program operator.*
- *I have not been involved in defining the scope or carrying out any of the work to develop the product category rule (PCR) at hand (i.e., I have not been part of the PCR committee).*
- *I do not have a vested financial, political or other significant interest in the outcome of the PCR.*
- *If serving as the chair of the PCR review panel, I am not a full-time or part-time employee of a manufacturer producing the products covered by the product category or of their suppliers.*

My competencies relevant to the PCR review at hand include knowledge of and proficiency in (check all that apply):

- ❑ *The product category that is the subject of the PCR and its associated environmental aspects.*
- ❑ *LCA methodology and practice.*
- ❑ *ISO 14025:2006, ISO/TS 14027:2017 and ISO 21930:2017.*
- ❑ *ISO 14040:2006, ISO 14044:2006 and ISO/TS 14071:2014.*
- ❑ *The regulatory framework within the scope of the PCR.*
- ❑ *The environmental product declaration (EPD) program(s) in which this PCR is intended to be used.*

I declare that the above statements are truthful and complete. I will immediately notify all parties involved—including the program operator and other PCR reviewers, as applicable—if the validity of any of these statements changes during the course of the review process.

Date:

Name (print):

Signature:

EPD Verifier Qualifications

The EPD shall be verified by a competent independent external EPD verifier. An independent external verifier is a person who:

- Is not employed (full-time or part-time) with the commissioner or practitioner of the LCA study.
- Was not otherwise involved in the execution of the LCA that is used during development of the EPD.
- Has not been otherwise involved in the development of the EPD.

The EPD verifier shall have competence in LCA and/or EPD development, indicated by evidence of knowledge of the relevant sector, product and product-related environmental aspects as well as—at a minimum—one of the following:

- Employment with (full-time or part-time) or contractual agreement with an organization that has been accredited according to ISO 14025:2006 by an accreditation body that operates in accordance with ISO/IEC 17011:2017 and is an International Accreditation Forum Multilateral Recognition Agreement signatory for ISO/IEC 17029:2019 or ISO/IEC 17065:2012.
- ACLCA Life Cycle Assessment Certified Professional status, with two letters of reference.

- Demonstration of five years of relevant LCA and/or EPD experience with two letters of reference.

The program operator shall require that the EPD verifier have a signed self-declaration of verifier independence and competencies (see example declaration below).

Example Declaration for EPD Verifier

I, the signatory, hereby declare that:

- *I am not a full-time or part-time employee of the commissioner or practitioner of the life cycle assessment (LCA) study and was not otherwise involved in the execution of the LCA.*
- *I was not involved in the development of the environmental product declaration (EPD).*
- *I have no other conflicts of interest resulting from my position.*
- *I do not have a vested financial, political or other significant interest in the outcome of the LCA study or EPD.*

My competencies relevant to the EPD verification at hand include knowledge of and proficiency in:

- *The sector, product and product-related environmental aspects associated with the product addressed by the EPD.*
- *Process and product knowledge of the product category addressed by the product category rule (PCR) used to develop the EPD.*
- *LCA methodology and practice.*
- *ISO 14025:2006, ISO 14040:2006, ISO 14044:2006, ISO/TS 14071:2014 and ISO 21930:2017.*
- *The regulatory framework within which the EPD has been prepared.*
- *The EPD program(s) under which this EPD is being developed.*

I declare that the above statements are truthful and complete. I will immediately notify all parties involved—including the organization developing the EPD and the EPD owner, as applicable—if the validity of any of these statements changes during the course of the review process.

Date:

Name (print):

Signature:

Appendix F: Reasoning for Preference of Use of Free-to-Use and Publicly Accessible Datasets in LCAs

Federal Government Use of Standards

Consistent with Section 12(d) of the National Technology Transfer and Advancement Act and related federal policies, federal government agencies like EPA have a long track record of participating in and using standards developed through processes led by the private sector. See the EPA Voluntary Consensus Standards website for additional information. Many of these private sector standards are developed using procedures that have been accredited against the ANSI Essential Requirements. The ANSI Essential Requirements help standards bodies demonstrate that their processes meet the criteria for voluntary consensus standards. Section 12(d) of the NTTAA and related federal policies establish a preference for using voluntary consensus standards in lieu of government standards.

The ANSI Essential Requirements also help prevent violation of U.S. antitrust law or other anticompetitive behavior in developing standards. Of note is Article 3.2 of the ANSI Essential Requirements, which addresses commercial terms and conditions. Article 3.2 generally prohibits including terms or conditions that are primarily contractual or commercial in nature, as opposed to technical, engineering or scientific in nature. Prohibited items include incorporating contractual requirements (3.2.1); endorsing or requiring the use of proprietary products or services (3.2.2); or endorsing or requiring the use of particular conformity assessment bodies, testing facilities or training organizations (3.2.3). This prohibition against including commercial terms is echoed in competition law guidelines published by ISO and the International Electrotechnical Commission.

EPA has a strong preference that the organizations developing PCR standards align their processes with the attributes of voluntary consensus standards over the coming years. This preference is consistent with Section 12(d) of the NTTAA and related federal policies, and with EPA's approach in the Framework for Assessing Environmental Performance Standards and Ecolabels for Federal Purchasing. EPA recognizes that doing so will take time, and that it may not be practical for all program operators and PCR committees. However, at a minimum, it is essential that organizations developing PCR standards comply with relevant antitrust and anticompetition laws. However, under any circumstances, it is essential that organizations developing PCR standards comply with relevant antitrust and anticompetition laws.

In addition to creating potential antitrust and anticompetition risks, having commercial terms in PCRs could create risks for federal agencies seeking to use PCRs to support procurement decisions.

Risks to Federal Agencies When Commercial Terms (Including Proprietary Datasets) Are Used in PCRs

The Inflation Reduction Act directed federal agencies to use EPDs to inform procurement of low embodied carbon construction materials. However, federal agencies have a shared concern surrounding the replicability of EPD results. These concerns all focus on EPDs that are associated with materials and products that are directly purchased and directly delivered to federally funded construction sites. When PCRs require the use of proprietary datasets, federal agencies are forced to purchase access to the specified proprietary secondary datasets to accurately replicate results. To

confirm manufacturer claims regarding embodied carbon of construction materials, federal agencies follow PCRs, which are currently outlining three approaches associated with secondary datasets:

1. Prescription of proprietary datasets.
2. Prescription of public datasets.
3. No guidance on which specific datasets to use.

Risk of Prescription of Proprietary Datasets

- Contrary to ANSI Essential Requirements.
- Contrary to OMB A-119 and the NTTAA.
- Potentially contrary to the three major antitrust laws that affect standard setting (the Sherman Act, the Clayton Act and the Federal Trade Commission Act).
- No standard to evaluate fitness of modeling (at the present time).

Risk of Prescription of Free-to-Use and Public Datasets

- Not consistently funded; however, EPA is entering into a nonfinancial commitment Memorandum of Understanding with other agencies for the Federal LCA Commons.
- No standard to evaluate fitness of modeling.

Risk of No Guidance on Which Specific Datasets to Use

- Lack of consistency of EPD impact calculations, resulting in an inability to compare results for threshold setting.

While the federal government has outlined challenges associated with commercial terms, it is the PCR developers' responsibility to ensure their own compliance with U.S. antitrust law.

For more information on how EPA is addressing the concerns and risks associated with the prescription of free-to-use and publicly accessible datasets, please see Appendix A. PCR program operators interested in technical assistance in better aligning with voluntary consensus standards approaches may contact EPA by visiting EPA's website.

Appendix G: Recommended Charts to Include in PCRs

Appendix G.1: Recommended Data Disclosure Charts for PCRs

Below is an example data disclosure chart for secondary data sources specified in PCRs. This includes the following considerations:

A. The specified secondary datasets shall be free-to-use and publicly accessible to all users of the PCR in order to create EPDs.[37] EPA will allow program operators to specify selected datasets until January 1, 2026 (see Criterion 3.2.B for more information). After that date, the PCR must be updated to prescribe EPA-designated public datasets for processes that occur within the United States of America, where available.

B. Temporal, geographical and technological coverage of the secondary data shall be compatible with the scope of the PCR.

C. System boundaries shall be equivalent, and reference flows shall be adaptable to the product system specified in the PCR.

D. The secondary data's sources, year of publication and reporting period shall be cited.

E. Allocation procedures used for secondary data shall be appropriate for the system under study.

These specifications shall be tied to specific flows as outlined in bullet "C" above (system boundaries). Furthermore, all flows shall be listed within comprehensive lists tied to each LCA module being reported on under the scope of the PCR. These flows shall be identified via the LCA that supports and aligns with the scope of the PCR.

EXAMPLE Table G-1. Data Disclosure Chart for Secondary Data Sources Specified in PCRs

Material/Process Category[a]	Material/Process Name[b]	Secondary Inventory Dataset Name[c]	Dataset Geographic Region[d]	Year Dataset Represents	Reference[e]
Transport	Transport Mode A	Exact dataset name	Most granular region specified and country	Year or range of years	Full reference, including LCI database version number and year; link to underlying public dataset
	Transport Mode B				

[37] EPA is actively working to improve free-to-use and publicly accessible datasets. At a minimum, this will include efforts relating to electricity, fuels, and transportation flows. More information on how the federal government is investing in improvements to free-to-use and publicly accessible datasets can be found in Appendix A and on EPA's website.

Material/Process Category[a]	Material/Process Name[b]	Secondary Inventory Dataset Name[c]	Dataset Geographic Region[d]	Year Dataset Represents	Reference[e]
Energy					
Material					

[a] Add rows to include additional material/process categories.

[b] Add rows to include additional specifications for secondary LCI data.

[c] Specify the exact LCI dataset name as it appears in reference, e.g., "Transport, combination truck, long-haul, diesel powered, Southeast."

[d] Specify the most granular region available and country (e.g., Southeast, United States). If country-level data are not available, provide broader region (e.g., North America, global).

[e] Include year secondary dataset published and version number of dataset and LCI database (if available), e.g., U.S. Life Cycle Inventory Database_2024_Q1_V1. National Renewable Energy Laboratory. Dataset available at: https://www.lcacommons.gov/lca-collaboration/National_Renewable_Energy_Laboratory/USLCI_Database_Public/dataset/PROCESS/a17f251a-de94-3933-b3b1-61aef7df590d.

Appendix G.2: Recommended Data Disclosure Charts for EPDs

Below contains an example data disclosure chart for data sources used to produce EPDs from their relevant PCRs.

EXAMPLE: Table G-1. Data Disclosure Chart for Data Sources Used for Resulting EPDs

Module	Material/Unit	Data Source	Data Source Geographic Coverage	Year(s)
A1	Material A	Association X industry average EPD	North America	2020
A1	Material B	Product- and facility-specific EPD (include name)	Specific facility	2021
A1	Material C	LCI dataset for Y (provide dataset name, version and process)	United States	2019
A2	Transportation	LCI dataset for Z (provide dataset name, version and process)	United States	2018
A3	Production facility emission source	Company X	Specific facility	2023

Appendix H: Additional Information and Recommended Text Associated with Recycled Content Disclosure Requirements

EPA has determined through the development of the ReCon Tool and other research that there is a correlation between the recycled content included in a product and the embodied carbon emissions associated with that product, after accounting for pertinent factors such as material type, material mass and regionality. EPA recommends that recycled content and the allocation approach used be disclosed in EPDs to further investigate the correlation.

The following is recommended PCR text associated with Criterion 3.3.E.

> *The manufacturer will report the pre- and post-consumer recycled content for the product. Differentiating between the two is important because sources, recovery methods, required processing and associated impacts for pre- and post-consumer recycling will vary. Additionally, post-consumer recycling supports diverting material from landfills and incineration since the material would have otherwise reached its end use. Refer to the Terms and Definitions section of this document for more on pre- and post-consumer recycled content.*
>
> *The manufacturer will report whether the recycled content is facility specific, whether it has been third-party verified and if so, under which standard.*
>
> *The EPD must disclose which allocation approach was used.*
>
> *In cases where an input from an upstream manufacturer contains recycled content, the percent of recycled content for the product being reflected in the current EPD must be adjusted. For example:*
>
> - *A product is composed of 60 percent material input A and 40 percent material input B.*
> - *Material input A contains 30 percent recycled content, and material input B contains 100 percent recycled content.*
> - *Therefore, the recycled content percentage of the product can be calculated as follows:*
>   *(0.30 × 0.60) + (1.00 × 0.40) = 0.58 = 58%*
>
> *If the percentage of recycled content for an upstream input cannot be determined, the user must assume 0 percent recycled content for the upstream input. The results may be qualified as "at least." For example:*
>
> - *A product is composed of 60 percent material input A and 40 percent material input B.*
> - *It is unknown how much recycled content is contained in material input A. Material input B contains 100 percent recycled content.*
> - *Therefore, the minimum recycled content percentage of the final product can be calculated as follows:*
>   *(0.00 × 0.60) + (1.00 × 0.40) = 0.40 = 40%*
> - *In other words, the product contains at least 40 percent recycled content.*

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Terminology

Allocation: Partitioning the input or output flows of a process or a product system between the product system under study and one or more other product systems. This definition is consistent with the one in ISO 14044:2006.

Byproduct: A coproduct from a process that is incidental or not intentionally produced and that cannot be avoided. Note: Wastes are not byproducts. This definition is consistent with the one in ISO 21930:2017.

Construction material: The supplies used in building. This definition is consistent with the one in EPA's Enterprise Vocabulary.

Coproduct: Any of two or more products coming from the same unit process or product system. This is consistent with the definition in ISO 14044:2006.

Cradle-to-gate: A type of EPD regarding the life cycle stages covered in which the production stage is reported on and includes the following A1 to A3 information modules: extraction and upstream production (raw material supply), transport to factory, and manufacturing. This definition is consistent with the one in ISO 21930:2017, Section 5.2.2.

Cradle-to-grave: A type of EPD regarding the life cycle stages covered in which the production stage (A1 to A3) and all the information modules from the construction stage (A4 to A5), use stage (B1 to B7), and end-of-life stage (C1 to C4) are reported on. This definition is consistent with the one in ISO 21930:2017, Section 5.2.2.

Declared unit: Quantity of a construction material used as a reference unit in an EPD based on an LCA for the expression of environmental information needed in information modules. This definition is based on the one in ISO 21930:2017.

Downstream PCR: A PCR that is covering a system or process carried out after the designated system or process associated with the given PCR. This definition is based on the definition of the term "Downstream Process" found in ISO 21930:2017.

End-of-life: The stage for a construction material that starts when it is replaced, dismantled or deconstructed from the construction works and does not provide any further functionality. The end-of-life LCA stage includes information modules C1 to C4. This definition is based on the one outlined in ISO 21930:2017.

Environmental product declaration (EPD): An environmental claim providing quantified environmental data using predetermined parameters and, where relevant, additional environmental information. An EPD also includes additional product and company information. This definition is consistent with the one in ISO 14025:2006.

Foreground data: Data contained within the process(es) a manufacturer is modeling for its product system.

Functional unit: The unit of comparison that assures that the products being compared provide an equivalent level of function or service.

Gate: The point at which a construction product or material leaves the factory before it becomes an input into a subsequent manufacturing process or before it is transported to a distributor, another factory or a construction site. This definition is consistent with the one in ISO 21930:2017.

Global Warming Potential (GWP): The term "GWP" is used in EPDs, PCRs, and Buy Clean policies for construction products as an impact category to report on embodied GHG emissions (per ISO 21930:2017, Section 7.3, Table 5). In the ISO context, "GWP" is conveyed in CO_2e/unit of product/material to denote the product level GHG emission intensities. We note this usage is inconsistent with how GWP is defined by the Intergovernmental Panel on Climate Change (IPCC) and in other GHG accounting efforts, including national reporting by Parties to the Paris Agreement. Per IPCC, GWP is an index measuring the radiative forcing following an emission of a unit mass of a given substance, accumulated over a chosen time horizon, relative to that of the reference substance, carbon dioxide (CO_2). For more information on the definition and use of the term, "GWP" (Global Warming Potential), please see https://www.epa.gov/ghgemissions/understanding-global-warming-potentials.

Gross GHGs: The total amount of greenhouse gases emitted into the atmosphere.

LCA produced for the PCR (underlying LCA): An LCA conducted during the establishment or update of a PCR that aligns with the scope of the PCR and is used as the basis for claims and determinations made within the PCR.

Life cycle: All consecutive and interlinked stages in the life of the object under consideration. This definition is consistent with the one in ISO 21930:2017.

Life cycle assessment (LCA): The compilation and evaluation of the inputs, outputs and potential environmental impacts of a product system throughout its life cycle. This definition is consistent with the one in ISO 14044:2006.

Life cycle impact assessment (LCIA): The phase of LCA aimed at understanding and evaluating the magnitude and significance of the potential environmental impacts for a product system throughout the life cycle. This definition is consistent with the one in ISO 21930:2017.

Life cycle inventory (LCI): The phase of life cycle assessment involving the compilation and qualification of inputs and outputs for a product throughout its life cycle. This definition is consistent with the one in ISO 14044:2006.

Location-based accounting: A method to quantify scope 2 GHG emissions based on average energy generation emission factors for defined locations, including local, subnational or national boundaries. This definition is consistent with the one in the Scope 2 Standard of the GHG Protocol.

Market-based accounting: A method to quantify scope 2 GHG emissions based on GHG emissions emitted by the generators from which the reporter contractually purchases electricity bundled with instruments, or unbundled instruments on their own. This definition is consistent with the one in the Scope 2 Standard of the GHG Protocol.

Material category: A group of construction products, construction elements or integrated technical systems that can fulfill equivalent functions.

Post-consumer recycled content: Proportion, by mass, of recycled material generated by households or by commercial, industrial and institutional facilities in their role as end users of the product that can no longer be used for its intended purpose. This content includes returns of material from the distribution chain. This definition is consistent with the one in ISO 14021:2016.

Pre-consumer recycled content: Proportion, by mass, of recycled material diverted from the waste stream during a manufacturing process. Excluded from this definition is reutilization of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it. This definition is consistent with the one in ISO 14021:2016.

Primary data: Data determined by direct measurement, estimation or calculation based on specific original source measurements for the specific system under investigation. This definition is based upon the one in ISO 21930:2017.

Product category rules (PCRs): A set of specific rules, requirements and guidelines for developing EPDs for one or more product categories. This definition is consistent with the one in ISO 14025:2006.

Product category rule committee (PCR committee): Group of interested parties tasked by the program operator with drafting and finalizing the product category rules. This definition is consistent with the one in ISO/TS 14027:2017.

Product type: A specific breakdown within a material category that adds specificity to what subgroup of a material category is being referred to in a given context.

Program operator: The body or bodies that conduct an EPD program. A program operator can be a company or group of companies, industrial sector or trade association, public authority or agency, or an independent scientific body or other organization. Program operators are typically the organizations that develop PCRs. This definition is based on the one in ISO 14025:2006.

Reference LCA: An LCA conducted prior to establishing or updating a PCR that aligns with the scope of the PCR and is used as the basis for claims and determinations made within the PCR.

Scope 2 emissions: The indirect emissions from the generation of purchase or acquired electricity, steam, heat or cooling consumed by the reporting entity.

Secondary data: Data indirectly determined through measurement, estimation or calculation and not based on specific original source measurements. This can include data that is originally developed using primary data sources, but is further aggregated to represent average processes or products. This definition is based on the one in ISO 21930:2017.

Type III environmental product declaration (Type III EPD): An environmental claim that provides quantified environmental data using predetermined parameters and, where relevant, additional environmental information. This definition is consistent with the one in ISO 14025:2006.

Unit process: Smallest element considered in the LCI for which input and output data are quantified. This definition is consistent with the one in ISO 14040:2006.

Upstream product category rule (upstream PCR): A PCR covering a system or process that is carried out before the designated system or process associated with the given PCR. This definition is based on the definition of the term “Upstream Process” found in ISO 21930:2017.

Waste: Substances or objects that the holder intends or is required to dispose of. This definition is consistent with the one in ISO 14044:2006.

List of Abbreviations

Abbreviation	Full Description
ACLCA	American Center for Life Cycle Assessment
ANSI	American National Standards Institute
CO_2e	carbon dioxide equivalent
DOD	Department of Defense
DOE	Department of Energy
DOT-FHWA	Department of Transportation–Federal Highway Administration
DQA	data quality assessment
EAC	energy attribute certificate
EPA	Environmental Protection Agency
EPD	environmental product declaration
EPI	Energy Performance Indicator
FEMA	Federal Emergency Management Agency
FLCAC	Federal LCA Commons
GHG	greenhouse gas
GHGRP	Greenhouse Gas Reporting Program
GSA	General Services Administration
GWP	global warming potential
IDDI	Industrial Deep Decarbonization Initiative
IEC	International Electrotechnical Commission
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
LCA	life cycle assessment
LCI	life cycle inventory
LCIA	life cycle impact assessment
NTTAA	National Technology Transfer and Advancement Act
OMB	Office of Management and Budget
PCR	product category rule
REC	renewable energy certificate
SI	International System of Units
TS	Technical Specification
UNIDO	United Nations Industrial Development Organization
U.S.	United States of America
USDA	United States Department of Agriculture