U.S. General Services Administration
Interim IRA Low Embodied Carbon Material Requirements
May 16, 2023

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Preface

The Inflation Reduction Act of 2022 (IRA), Pub. L. No. 117-169, was enacted in August 2022. The IRA made the single largest investment in climate and energy in American history. The IRA will help the United States tackle the climate crisis, advance environmental justice, and secure our Nation's position as a world leader in domestic clean energy manufacturing. This law puts the United States on a pathway to achieving the Administration's climate goals, including a net zero operational emissions federal building portfolio by 2045, and net zero emissions procurement by 2050. IRA Section 60503 provides the U.S. General Services Administration (GSA) with $2.15 billion for acquisition and installation of construction materials and products with substantially lower levels of embodied greenhouse gas emissions as compared to estimated industry averages, as determined by the Administrator of the U.S. Environmental Protection Agency (EPA). EPA issued its Interim Determination in December 2022.

GSA is proceeding with an IRA Pilot Program to use IRA Section 60503 funding for a limited number of construction projects. Consistent with standard GSA practice and the Federal Acquisition Regulation, and having taken public input into consideration, GSA is using these Interim IRA Low Embodied Carbon Material Requirements in the Pilot Program. GSA intends to update its interim requirements using lessons learned from the Pilot Program.

These Interim IRA Low Embodied Carbon Material Requirements apply to IRA-funded purchases of four key construction materials: concrete (and cement), asphalt, steel, and glass. Construction product assemblies (such as window assemblies or rebar-reinforced concrete) qualify for IRA funding if at least 80% of the assembly's total cost or total weight comprises materials that meet these Requirements. These Interim IRA Low Embodied Carbon Material Requirements do not apply to all procurements and are only binding after a contracting officer exercises his or her discretion to incorporate IRA § 60503-qualifying materials or products into a procurement contract. Additionally, these Interim IRA LEC Materials Requirements do not supersede existing laws such as the Buy American Act of 1933 or the Trade Agreements Act of 1979. All materials and products procured for GSA projects must meet these laws. For IRA Section 60503-funded procurements, existing trade-related laws will be applied first, then GSA's Interim IRA LEC Material Requirements will be applied.

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Concrete

- **Material Type**
  - Concrete is a composite material consisting of a mixture of hydraulic "e.g. portland" cement, aggregates, and water, with or without admixtures, fibers, or other cementitious materials.
    - Concrete can be mixed at a job site, or "ready mixed" and batched for delivery from a central plant. Its wide-ranging applications include foundations, floors, walls, and roadways.
  - Construction product assemblies (such as rebar-reinforced concrete, or concrete made with qualifying cement) qualify for IRA funding if at least 80% of the assembly's total cost or total weight comprises materials that meet these Requirements.
    - Where provision of concrete that qualifies under these GSA IRA Limits is impractical, GSA's IRA Limits for cement may be applied to the cement being used in the concrete mix.
- **GSA IRA LEC Material Requirements**

	GSA IRA Limits for Low Embodied Carbon Concrete - May 16, 2023 (EPD-Reported GWPs, in kilograms of carbon dioxide equivalent per cubic meter - $kgCO_2e/ m^3$)		
Specified concrete strength class (compressive strength [f'c] in pounds per square inch [PSI])	**Top 20% Limit**	**Top 40% Limit**	**Better Than Average Limit**
≤2499	**228**	**261**	**277**
3000	**257**	**291**	**318**
4000	**284**	**326**	**352**
5000	**305**	**357**	**382**
6000	**319**	**374**	**407**
≥7200	**321**	**362**	**402**
Add 30% to these numbers for GWP limits where high early strength[1] concrete mixes are required for technical reasons.			

- **Compliance Documentation**
  - A product-specific Type III (third-party verified) Environmental Product Declaration (EPD) that: (i) is based on the PCR used to develop these limits: NSF International's Product Category Rule for Concrete (8/2021, version 2.1); and (ii) conforms with ISO 14025 and ISO 21930.
    - Where feasible, EPDs must also rely on facility-specific data, including for the supply chain's associated unit processes, such as concrete's upstream cement plant, rather

[1] "High early strength" is concrete that, through the use of additional cement, high-early-strength cement, or admixtures, has accelerated early-age strength development. High early strength concrete produced using additional cement should be avoided where possible, due to its higher embodied carbon. An affected project delivery team must obtain written approval from GSA's IRA PMO on whether high early strength concrete is necessary for technical reasons. This 30% allowance reflects input from building sustainability experts, general contractors, engineers, and ready-mix or cement producers.

than industry or manufacturer average data. If an EPD containing facility-specific data for the material's most greenhouse-gas intensive processes is unavailable, an EPD without such data that meets Compliance Documentation criteria (i) and (ii) is sufficient.

- ENERGY STAR Energy Performance Score for supplying cement plant, the manufacturing plant name(s) and location(s), and the data period of the Energy Performance Score(s) at the time of purchase. Please see "ENERGY STAR Energy Performance Score Explained" at bottom for more information.

Cement

- **Material Type**
  - Cement is the basic ingredient of concrete. Cement (including portland and portland-limestone cement) is manufactured through the chemical combination of ingredients including calcium, silicon, aluminum, and iron. When heated at high temperatures in kilns, some elements are driven off in the form of gasses, while others unite to form a new substance called clinker. Clinker is cooled, ground, and mixed with small amounts of gypsum and limestone to make cement.
    - When cement creates a paste with water that binds with sand and rock "aggregates" to harden, it forms concrete. Cement is transported to ready-mix concrete companies to be used in concrete for a wide variety of construction purposes.
- **GSA IRA LEC Material Requirements**
  - Where provision of concrete that qualifies under these GSA IRA Limits is practical, GSA's IRA Limits for Low Embodied Concrete must be used.
  - Where provision of concrete that qualifies under these GSA IRA Limits is impractical, GSA's IRA Limits for cement may be applied to the cement being used in the concrete mix.
    - A concrete EPD accounts for the whole mix design, including quantitative impacts of specific cements, aggregates, and admixtures.
    - If a concrete EPD is provided to demonstrate compliance, a cement EPD doesn't need to be submitted to GSA. Cement is an input to concrete mixes, and its GWP is accounted for in the concrete EPD.
    - Construction product assemblies can also qualify for IRA funding where at least 80% of the assembly's total cost or total weight comprises IRA-qualifying material such as low embodied carbon cement.

GSA IRA Limits for Low Embodied Carbon Cement - May 16, 2023 (EPD-Reported GWPs, in kilograms of carbon dioxide equivalent per metric ton - $kgCO_2e/ t$)		
Top 20% Limit	**Top 40% Limit**	**Better Than Average Limit**
751	**819**	**858**

- **Compliance Documentation**
  - A product-specific Type III (third-party verified) Environmental Product Declaration (EPD) that: (i) is based on the PCR used to develop these limits: NSF International's Product Category Rule for Portland, Blended, Masonry, Mortar, and Plastic (Stucco) Cements (9/2021, version 3.2; or 5/2020, version 3.0); and (ii) conforms with ISO 14025 and ISO 21930.
    - Where feasible, EPDs must also rely on facility-specific data, including for the supply chain's associated unit processes, rather than industry or manufacturer average data. If an EPD containing facility-specific data for the material's most greenhouse-gas intensive processes is unavailable, an EPD without such data that meets Compliance Documentation criteria (i) and (ii) is sufficient.
  - ENERGY STAR Energy Performance Score for the cement plant, the manufacturing plant name(s) and location(s), and the data period of the Energy Performance Score(s) at the time of purchase. Please see "ENERGY STAR Energy Performance Score Explained" at bottom for more information.

Concrete Masonry Units

- **Material Type**
  - Concrete masonry units (CMUs) are standard-sized rectangular blocks used in building construction, sometimes referred to as cinder blocks.
    - Other types of manufactured concrete can include concrete brick, concrete pavers and slabs, segmental concrete retaining walls, manufactured veneer stone, and concrete roof tiles.
- **GSA IRA LEC Material Requirements**

GSA IRA Limits for Low Embodied Carbon Concrete Masonry Units - May 16, 2023 (EPD-Reported GWPs, in kilograms of carbon dioxide equivalent per cubic meter - $kgCO_2e/ m^3$)		
Top 20% Limit	**Top 40% Limit**	**Better Than Average Limit**
217	**256**	**290**

- **Compliance Documentation**
  - A product-specific Type III (third-party verified) Environmental Product Declaration (EPD) that: (i) is based on a PCR for the applicable product category that was active when the EPD was issued, and which was used to develop these limits: ASTM International's PCR for Precast Concrete (5/2021, version 3.0) or UL's Part B: Concrete Masonry and Segmental Concrete Paving Product EPD Requirements (3/2022, version 1.1); and (ii) conforms with ISO 14025 and ISO 21930.
    - Where feasible, EPDs must also rely on facility-specific data, including for the supply chain's associated unit processes, such as concrete's upstream cement plant, rather than industry or manufacturer average data. If an EPD containing facility-specific data for the material's most greenhouse-gas intensive processes is unavailable, an EPD without such data that meets Compliance Documentation criteria (i) and (ii) is sufficient.
  - ENERGY STAR Energy Performance Score for supplying cement plant, the manufacturing plant name(s) and location(s), and the data period of the Energy Performance Score(s) at the time of purchase. Please see "ENERGY STAR Energy Performance Score Explained" at bottom for more information.

Asphalt

- **Material Type**
  - Asphalt concrete is a mixture mainly composed of mineral aggregates, asphalt binder, and additives.
    - Aggregates and asphalt binder are typically heated at an asphalt plant, mixed according to precise formulas, and loaded into trucks for transport to paving sites.
- **GSA IRA LEC Material Requirements**

GSA IRA Limits for Low Embodied Carbon Asphalt - May 16, 2023 (EPD-Reported GWPs, in kilograms of carbon dioxide equivalent per metric ton - $kgCO_2e/ t$)		
Top 20% Limit	**Top 40% Limit**	**Better Than Average Limit**
55.4	**64.8**	**72.6**

- **Compliance Documentation**
  - A product-specific Type III (third-party verified) EPD that: (i) is based on the PCR used to develop these limits: the National Asphalt Paving Association's Product Category Rule for Asphalt Mixtures, (4/2022, version 2.0); and (ii) conforms with ISO 14025 and ISO 21930.
    - Where feasible, EPDs must also rely on facility-specific data, including for the supply chain's associated unit processes, such as asphalt binder production, rather than industry or manufacturer average data. If an EPD containing facility-specific data for the material's most greenhouse-gas intensive processes is unavailable, an EPD without such data that meets Compliance Documentation criteria (i) and (ii) is sufficient.

Steel

- **Material Type**
  - Steel is an alloy of iron and carbon. It often contains small quantities of silicon, phosphorus, sulfur, and oxygen. Steel can be repeatedly recycled without losing its properties, and may contain high recycled content. Steel products are often plated or coated, e.g. zinc-galvanized.
    - Steel can be made into product categories including hot rolled structural steel, fabricated steel plate, fabricated hollow steel structural sections (cold-formed welded steel tubing produced in round, square, and rectangular shapes), steel reinforcing bars (rebar), and cold-formed steel framing.
  - Construction product assemblies (such as fabricated steel products including handrails, conduit, ductwork, pipes, metal raceways, etc.) qualify for IRA funding if at least 80% of the assembly's total cost or total weight comprises materials that meet these Requirements.
- **GSA IRA LEC Material Requirements**

	GSA IRA Limits for Low Embodied Carbon Steel - May 16, 2023 (EPD-Reported GWPs, in kilograms of carbon dioxide equivalent per metric ton - $kgCO_2e/t$)		
Steel Product Category	**Top 20% Limit**	**Top 40% Limit**	**Better Than Average Limit**
Rebar (fabricated)	**728**	**794**	**850**
Rebar (unfabricated)	**611**	**716**	**760**
Hollow Structural Sections (fabricated)	**1,778**	**1,854**	**1,898**
Hollow Structural Sections from Electric Arc Furnaces (unfabricated)	**1,580**	**1,620**	**1,652**
Hollow Structural Sections from Integrated Mills* (unfabricated)	**TBD**	**TBD**	**TBD**
Hot-Rolled Sections (fabricated)	**1,022**	**1,128**	**1,163**
Hot-Rolled Sections (unfabricated)	**686**	**713**	**869**
Cold-Formed and Galvanized (stud, track, framing, etc.)	**2,228**	**2,324**	**2,408**
Structural Steel Plate from Electric Arc Furnaces (unfabricated)	**987**	**1,152**	**1,190**

Structural Steel Plate from Integrated Mills* (unfabricated)	**TBD**	**TBD**	**TBD**

- *GSA recognizes merit in separate GWP limits for integrated mill and electric arc furnace steel production methods in these product categories. Once adequate data is available (e.g. from EPDs), GSA plans to develop and issue one or more limits for materials made via integrated steel mills.

- **Compliance Documentation**
  - A product-specific Type III (third-party verified) EPD that: (i) is based on the PCRs used to develop these limits: UL's PCR Guidance for Building-Related Products and Services, Part B: Designated Steel Construction Product EPD Requirements (8/2020, version 2.0) or SCS Global Services' PCR for Designated Steel Construction Products (5/2015, version 1.0); and (ii) conforms with ISO 14025 and ISO 21930.
    - Where feasible, EPDs must also rely on facility-specific data, including for the supply chain's associated unit processes, such as fabricated steel's upstream steel mill(s), rather than industry or manufacturer average data. If an EPD containing facility-specific data for the material's most greenhouse-gas intensive processes is unavailable, an EPD without such data that meets Compliance Documentation criteria (i) and (ii) is sufficient.
  - If steel originates from an integrated steel mill: ENERGY STAR Energy Performance Score for supplying integrated steel mill, the manufacturing plant name(s) and location(s), and the data period of the Energy Performance Score(s) at the time of purchase. Please see "ENERGY STAR Energy Performance Score Explained" at bottom for more information.

Glass

- **Material Type**
  - Flat glass is made from molten material consisting of a combination of silica sand, limestone, soda ash, dolomite and glass cullet spread onto sheets on a plane to produce flat, float, rolled, plate or sheet glass. Flat glass is sometimes bent after production of the plane sheet. The general term "flat glass" describes all glass produced in a flat form, such as float glass, sheet glass, plate glass and rolled glass.
    - Flat glass can be heat- or surface-treated to make processed glass, or built into assemblies such as insulating glass units (IGUs), laminated glazing units, and vacuum insulating glazing. Flat glass assemblies are often part of curtain walls, storefronts, transparent walls, window units, skylights, canopies, doors, and solar panels.
  - Construction product assemblies (such as processed glass fabricated from flat glass, or insulating glass units containing flat glass) qualify for IRA funding if at least 80% of the assembly's total cost or total weight comprises materials that meet these Requirements.
- **GSA IRA LEC Material Requirements**

	GSA IRA Limits for Low Embodied Carbon Glass - May 16, 2023 (EPD-Reported GWPs, in kilograms of carbon dioxide equivalent per metric ton - $kgCO_2e$ kg/ t)		
Glass Product Category[2]	**Top 20% Limit**	**Top 40% Limit**	**Better Than Average Limit**
Flat Glass (per metric ton)	**1,331**	**1,370**	**1,401**

- **Compliance Documentation**
  - A product-specific Type III (third-party verified) EPD that: (i) is based on the PCR used to develop these limits: the NSF International/ National Glass Association Flat Glass PCR (9/2020, version 2.0; or 3/2013, version 1.0); and (ii) conforms with ISO 14025 and ISO 21930.
    - Where feasible, EPDs must also be based on supply chain-specific data for associated unit processes, such as facility-specific data for processed glass's upstream glass plants, rather than industry or manufacturer average data. If an EPD containing facility-specific data for the material's most greenhouse-gas intensive processes is unavailable, an EPD without such data that meets Compliance Documentation criteria (i) and (ii) is sufficient.
  - ENERGY STAR Energy Performance Score for supplying flat/float glass plant, the manufacturing plant name(s) and location(s), and the data period of the Energy Performance Score(s) at the time of purchase. Please see "ENERGY STAR Energy Performance Score Explained" at bottom for more information.

[2] Based on input from the glass industry about inconsistent data from the limited set of processed glass and insulating glazing unit EPDs as of early 2023, GSA is only issuing GWP limits for unfabricated flat glass at this time.

ENERGY STAR Energy Performance Score Explained

ENERGY STAR Energy Performance Scores (EPS) show how efficiently a manufacturing plant uses energy on a 100-point scale. A score of 50 reflects average performance, 1 shows poor performance, and 100 reflects highest performance.

Contractors obtain Energy Performance Scores by requesting producers of cement, glass, asphalt mix, and steel (from integrated mills only) to provide the score. Or, contractors may request it from material suppliers (e.g. concrete producers).

Manufacturers of cement, glass and steel produce a plant's score by inputting 12 months of energy and production data in the industry-specific Energy Performance Indicator (EPI) tool available at www.energystar.gov/epis. The score will show on the Statement of Energy Performance section of the EPI.

Energy Performance Scores can currently be produced for cement, flat glass, and integrated steel mills. An EPS for asphalt mix plants is expected to be available by September 2023. EPA will notify GSA when to begin requesting asphalt mix plant scores.