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SUBJECT: COVER MEMO - EPA's Interim Determination for GSA & DOT/FHWA on low greenhouse gas construction materials under IRA Sections 60503 and 60506

In the attached interim determination, EPA prioritizes materials/products that have the highest global warming potential (GWP) impact in the *production* stage. EPA recognizes that the Inflation Reduction Act (IRA) directs consideration of the greenhouse gas emission impacts related to the use and disposal stages, as well, and that there are significant climate mitigation opportunities in taking these stages into account. Later phases of this work will consider how best to accommodate a broader approach.

For purposes of this interim determination, based on best available information, EPA interprets "substantially lower" as meaning a global warming potential (GWP) that is in the best performing 20% (Top 20%, or lowest 20% in embodied greenhouse gas emissions), when compared to similar materials/products. If no materials/products in the Top 20% are available in a project's location, then a material/product qualifies for funding under IRA section 60503 or 60506 per this interim determination if its GWP is in the Top 40% (lowest 40% in embodied greenhouse gas emissions). If materials/products in the Top 40% are not available in a project's location, then a material/product qualifies for funding under IRA section 60503 or 60506 per this interim determination if its GWP is better than the estimated industry average. Additionally, providers of qualifying materials/products are required to report the supplying plant's ENERGY STAR Energy Performance Score (EPS) where an Energy Performance Indicator is available.

The expectation is that this Environmental Product Declaration (EPD) based approach and the definition of "substantially lower embodied greenhouse gas emissions" will be reassessed and critically reviewed through stakeholder input over time. Some industry-wide EPDs have minimal transparency into the temporal, technological, and geographic representativeness of the background datasets that have the highest impacts to a materials/product's GWP. This needs to be better understood. But, using industry-wide EPDs or a population of existing product-specific EPDs as the source of determining thresholds aligns with:

- How states or other entities that have low embodied procurement requirements identify performance thresholds.[1]
- IRA Section 60116, which requires EPA to identify "estimated industry averages" based on EPDs and/or state determinations.
- Federal Buy Clean efforts, including GSA current standards.
- Approaches used by private-sector certifications and standards including LEED v4.1.

[1] EPA has drafted a landscape scan of state and other entities' approaches, which EPA plans to publish on our website in the coming months. Almost all entities rely on industry wide EPDs. Some set the threshold at or around the median. Others are more lenient by setting it around the lower 75th percentile for GWP performance (i.e., 75% of products qualify). However, these programs are typically not directed toward spending additional funding on "substantially lower" embodied carbon materials.

EPA's interim determination does not address what type of material should be used in a project (e.g., mass timber replacing steel, or copper compared to aluminum) but rather is limited to "like to like" comparisons. EPA applauds GSA's continued use of Whole Building Life Cycle Assessments (WBLCA) and portfolio-wide analyses to determine building construction/material type and priority investment for deep decarbonization and climate impact reductions from efficiency, mitigation, adaptation, and resiliency strategies. EPA also applauds FHWA's development of references and tools that promote the use of life cycle assessment throughout the pavement life cycle and encourages similar whole project approaches to determine the best opportunities for environmental protection for other DOT infrastructure assets.

EPA expects that the experience and results from implementing this determination in FY2023 will inform EPA's new programs to improve measurement and reporting of embodied greenhouse gas emissions (IRA Section 60112) and to provide carbon labeling (IRA Section 60116) for construction materials/products. To this end, we ask that GSA and DOT/FHWA assist EPA in fully understanding the GHG metrics, cost implications, procurement lessons, and other key data points associated with your agencies' implementation. EPA would like to work with GSA and DOT/FHWA on refining the data collection to ensure it is useful for decision making in support of our mutual goals. The following is a preliminary list of information that would support this objective. EPA is sensitive to the potential burden of collecting and managing this data and appreciates the opportunity to collaborate with GSA and FHWA to finalize this list:

*EPD-related data for each **newly manufactured** material/product procured with IRA funds:*

- Type and subtype (e.g., steel, rebar)
- Product performance specifications (actual specs to collect to be determined for each product category)
- EPD Type (e.g., industry average, manufacturer specific, facility specific, supply chain specific)
- EPD Owner
- EPD Publisher
- Manufacturer (A3)
- Manufacturing plant name and location (A3)
- Source of A1 data, if provided; indicate if data come from industry average, a company average or facility specific source. Regardless, indicate the name and location of source
    - Concrete-Provide name and location of cement plant
    - Glass-Provide name and location of glass plant
    - Steel-Provide name and location of steel mill
- Date EPD published
- Date EPD expires
- Reporting period of primary data
- Product kg CO2-equivalent (total from EPD life cycle phases combined)
- Product kg CO2-equivalent from phase A1 (if provided)
- Product kg CO2-equivalent from phase A2 (if provided)
- Product kg CO2-equivalent from phase A3 (if provided)
- Product kg CO2-equivalent range (min/max, standard deviation, or other measure of range) (if provided by the EPD)
- Source of global warming potential values (e.g., IPCC AR-4, 100-year)
- Product Category Rule (PCR) under which EPD was published (Program operator, PCR name, version, expiration date)
- Whether EPD indicates if PCR conforms to ACLCA Guidelines
- Life Cycle Assessment (LCA) software tool used (if applicable)

- Third party verifier
- Quantity procured
- Procurement period for when the EPD was collected (during bid, prior to installation, following installation, etc.)
- GWP thresholds for the 20th and 40th percentiles, and industry average against which the product is being compared.
- GWP threshold parameters (e.g., 3000 psi concrete for NAFTA countries)
- Source and date threshold established (e.g., name of database threshold established on x/x/2023)

Manufacturing plant energy performance-related information

- Plant name and location where cement, glass, asphalt mix or steel (produced at integrated mills only) was manufactured*
- Energy performance score**
- Reporting period of underlying data used to produce the score
- Volume of any construction product procured for the project but especially concrete (by type), glass, asphalt mix, and steel (e.g., cubic yards of concrete, square meters of glass, tons of steel, cubic yards of asphalt mix, etc.)
- Dollar value and date of product procured for the project

**Applies to steel if steel originates from an integrated steel mill, and will apply to asphalt when the asphalt Energy Performance Indicator becomes available – EPA will notify GSA and FHWA when to share this information for asphalt mix purchases.*
*** ENERGY STAR Industrial is evaluating EPS development for new sectors with high-volume purchases.*

*Data for **salvaged and reused** materials procured with IRA funds:*

- Estimates on funding needs for associated services (deconstruction, refurbishment, storage, transport, installation)
- Regional differentiation requirements for implementation (e.g., lack of infrastructure in some parts of the country, termite damage, etc.)
- Materials/products that are best/least suited for these approaches as part of your current spending plans
- Estimated weight of materials, by material type, reused
- Embodied greenhouse gas emissions savings calculations per project and calculator tool(s) used
- Dollar amount spent on salvaged materials from Federal projects and from external suppliers

EPA is interested in exploring the potential for other materials/products and other approaches (e.g., biobased, recycled content, ecolabels, more durable alternatives) to substantially reduce the embodied greenhouse gas emissions of federal construction projects and includes additional recommendations in these areas in the **Addendum**.

Finally, it is important to ensure that there is a fair and efficient mechanism to receive and respond to industry complaints related to the EPA determinations. We would like to meet with GSA and DOT/FHWA staff to explore how existing processes can be used or augmented for these new IRA programs.

EPA looks forward to partnering with GSA and DOT/FHWA to advance low embodied carbon construction and realize the climate goals of the Inflation Reduction Act!

Addendum – Construction Materials/Products for Further Exploration

Potential Phase 2 high <u>production</u> phase GWP materials: - Aluminum (building facades, window frames, etc.) - Insulation (fiberglass, mineral wool, foam based on blowing agents with higher GWPs, etc.) - Gypsum board, wallboard - Roofing materials	Producers of these materials should be informed that they could be considered in future phases of the Federal Buy Clean Initiative and EPA's IRA Sections 60503 and 60506 determination to give them time to prepare EPDs as well as consider seeking relevant certifications ahead of time. EPA is aware of growing architectural community consensus around ways to address embodied carbon in high impact potential material categories (e.g., https://materialspalette.org/palette/). EPA recommends that GSA and DOT/FHWA consider these approaches in procurement and, if implemented, provide EPA insights on how they are contributing to lowering the embodied carbon of your agencies' construction projects.
Biobased materials with inherently lower lifecycle carbon due to <u>sequestration</u> in the growth phase: -Mass timber - Straw, hemp, and other biobased materials -other TBD	EPA is not prepared to make a determination on these materials. EPA requests that GSA, FHWA, and the US Forest Service work together to develop a consensus perspective on what biobased/wood/lumber materials/products could qualify for EPA's consideration in any subsequent determination on these types of materials. *EPA strongly encourages sustainable forestry practices, beyond what is required by US law, be taken into account.* EPA is aware of growing architectural community consensus around ways to address embodied carbon via sequestering materials (e.g., https://materialspalette.org/palette/). EPA recommends that GSA and DOT/FHWA consider these approaches in procurement and, if implemented, provide EPA insights on how they are contributing to lowering the embodied carbon of your agencies' construction projects.
Products that reduce carbon in the <u>use</u> phase of a building/ transportation project: - Renewable energy technology products	All renewable energy technology products are recommended. Consistent with FAR requirements, PV modules and inverters shall be EPEAT registered when there is sufficient product availability (epeat.net). To achieve procurement of the lowest embodied carbon PV modules and inverters, ask for products or ask service providers to procure products which meet the optional low embodied carbon criterion, which will be added to the EPEAT system in FY23.
Materials/products that reduce carbon in the <u>use</u> phase of a building/transportation project: FEMP designated / ENERGY STAR certified: - HVAC/chillers - water heaters - windows - insulation - lighting	Given the lower use phase carbon emissions associated with these energy efficient products, ENERGY STAR certified and/or FEMP designated products are recommended.

- roofing, - doors, - appliances, - and other construction products	
No- or low-HFC refrigerant materials, products, and equipment listed by EPA's Significant New Alternatives Policy (SNAP) program.	Given the lower global warming potential of SNAP listed products, all SNAP listed products are recommended.
Recycled content construction materials that meet or exceed the recycled content requirements under RCRA Section 6002 - Insulation (multiple products) - Structural Fiberboard - Laminated Paperboard - Cement and Concrete - Polyester Carpet Face Fiber - Patio Blocks - Floor Tiles - Restroom Dividers/Partitions - Latex Paint - Carpet Cushion - Flowable Fill - Railroad Grade Crossing Surfaces - Modular Threshold Ramps - Nonpressure Pipe - Roofing Materials - And others applicable to building/transportation projects	Currently, RCRA Section 6002 does not include embodied carbon mandates. As a result, GHG emission reductions are not in the criteria to designate products under CPGs. Furthermore, EPA's Office of Resource Conservation and Recovery (ORCR) has not developed specific data to demonstrate the extent of GHG emission reductions associated with the designated products. Life cycle studies of various products from food to cement/concrete have consistently shown that the extraction and production life cycle stages tend to be the biggest GHG emission stages. Reducing extraction and production of raw materials (which recycling does) can significantly reduce GHG emissions and many other environmental impacts. There are also two ORCR tools that can be helpful in generalizing GHG emissions associated with the use of recycled products. These two tools (discussed below) would provide a qualitative answer to questions about reduced embodied carbon associated with the use of recycled content: 1. Recycled Content (ReCon) tool, which reports reductions in energy use and GHG emissions associated with the use of recycled content, ReCon is cited as intended to support voluntary reporting initiatives, as well as EPA's Comprehensive Procurement Guidelines (CPG) Program and other Environmentally Preferable Purchasing activities. That said, the utility of this tool may be somewhat limited since the tool may be more appropriate to model recycled content in homogeneous materials. While some CPG-designated products are homogeneous, others are not. 2. Waste Reduction Model (WARM) is a life cycle-based tool that provides high-level estimates of potential greenhouse gas emissions reductions, energy savings, and economic impacts from several different waste management practices, including recycling. For example, in WARM's Background and Overview document, we said: "*Reducing the amount of materials used to make products, extending product life spans, and maximizing recycling rates are examples of possible materials management strategies that can significantly reduce GHG emissions.*" (cited from 2009 EPA report called "Sustainable Materials Management: The Road Ahead")

	In summary, while CPGs do not explicitly consider or address embodied carbon reduction when designating new products, general tools and documents can be cited to support the claim that recycled-content products often have reduced embodied carbon by replacing virgin material extraction and production phase emissions.
Building products certified to EPA Recommended Ecolabels: - carpet - ceiling tiles - wallboard - tile - insulation - paint - other miscellaneous building finishes (like countertops) - others coming soon	Materials/products that address embodied greenhouse gas emissions through energy efficient manufacturing, renewable energy in manufacturing, use of recycled content, reduced shipping emissions, product take-back at end-of-life, and/or other documented means via certification to one or more of the following standards and ecolabels are already required to the maximum extent practicable per Executive Order 14057 and are recommended for addressing embodied carbon: • BIFMA e3 2019 Furniture Sustainability Standard • Cradle to Cradle Certified Product Standard • Environmental Choice New Zealand EC-07-18 Paints • Environmental Choice New Zealand EC-33-14 Synthetic Carpets* • Global Recycled Standard • Good Environmental Choice Australia (GECA) Floor Coverings* • Good Environmental Choice Australia (GECA) Paints & Coatings • Green Seal 11 Standard for Paints, Coatings, Stains, and Sealers • Green Seal 43 Standard for Recycled content Latex Paints • GreenCircle Certified Environmental Facts for Flooring Products • International Living Futures Institute: Declare 2.0 • International Living Futures Institute: Living Product Challenge 2.0 • Master Painters Institute Extreme Green • NSF/ ANSI 140 Sustainability Assessment for Carpet • NSF/ ANSI 332 Sustainability Assessment for Resilient Floor Coverings • Sustainable Materials Rating Technology (SMaRT) • Tile Council of North America (TCNA): ANSI A138.1/ Green Squared As EPA works to update the Recommendations in FY23, we will continue to refine this list. *Low product availability: this standard/ecolabel does not have at least three conforming products/services from at least two suppliers. These standards/ecolabels may also support other Administration priorities such as improving indoor air quality and avoiding PFAS.
Other <u>long-life/very durable</u> building materials not captured above	Given the lifecycle greenhouse gas emissions savings that come from avoiding more regular repair and replacement, “long life”/very durable materials not otherwise captured in this determination (e.g., terracotta roofing) are recommended. EPA would like to collaborate with GSA, FHWA, and external stakeholders in defining “long life” per material/product type.