



Industrial Innovation Initiative

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To: General Services Administration
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c/o Collette Scott

From: Industrial Innovation Initiative, I³

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Re: Federal Buy Clean Request for Information: Construction Materials with Substantially Lower Embodied Carbon

Background

The General Services Administration (GSA) has a crucial role to play in advancing the full scope of cross-cutting strategies key to achieving industrial decarbonization by midcentury. Public procurement of low-embodied carbon construction materials is critical to developing the low carbon market and incentivizing industrial decarbonization. This task, however, cannot be accomplished alone and there is a critical need for cross-agency coordination if the U.S. is to decarbonize these sectors effectively and efficiently. In response to the Federal Buy Clean Request for Information: Construction Materials with Substantially Lower Embodied Carbon, the Industrial Innovation Initiative (I³) has prepared the following document.

About I³

The [Industrial Innovation Initiative \(I³\)](#) is an ambitious coalition which aims to advance solutions key to decarbonizing the industrial sector through policy development and implementation, technology demonstration and adoption, and demand-side market development. The Initiative builds on years of stakeholder engagement and extensive work by its co-conveners, Great Plains Institute and World Resources Institute (WRI), to collaborate with government officials and advance decarbonization solutions important to the industrial sector.

I³ values a stable climate, a safe and healthy environment, thriving livelihoods for American workers, and a strong U.S. economy. I³ supports policies that will put American industry on a path to net-zero emissions, retain and create high-wage jobs, and advance technology leadership and economic competitiveness. The Initiative convenes key industry, environmental, labor, and other stakeholders, to advance cross-cutting strategies, policies, and programs for achieving industrial decarbonization by midcentury.

Question 3:

What strategies have you used to lower the embodied carbon of your products or materials? (Choosing alternative source materials; buying source materials that have EPDs; improving your plant's energy efficiency; improving transportation energy efficiency; other- please specify)

A clear and comparable data set is a necessary starting point for setting meaningful emissions intensity benchmarks. Disclosure of emissions intensity data through Type III product-specific environmental product declarations (EPDs), or other independently verified reporting mechanisms, is vital for ensuring an apples-to-apples comparison across products. GSA should be following a consistent scope and methodology when comparing these data, looking at cradle-to-gate emissions for all products. Using EPDs is the first step towards proving the lower embodied carbon of products.

The embodied carbon of industrial products and construction materials can be lowered through a variety of industrial decarbonization solutions, including:

- Switching to low-carbon fuels like clean hydrogen (hydrogen that meets or exceeds the Clean Hydrogen Production Standard) for relevant feedstocks and high-temperature heat processes;
- Electrification of low- and medium-temperature heat processes;
- Increased energy efficiency to reduce industrial energy demand where possible; and
- Carbon capture, utilization, and storage to mitigate otherwise unavoidable process emissions.

While lowering the embodied carbon of building materials is critical to achieving U.S. climate goals, GSA should, wherever possible, take into consideration the other environmental pollutants which can adversely affect the health of communities in and around production facilities. When making procurement decisions, considerations should be made holistically, accounting for both embodied carbon and the pollution that may result from various means of production. EPDs may be paired with other reporting mechanisms, such as the *Health Product Declaration*, to ensure a clear and comprehensive comparison across products.¹

Question 4:

Do you currently offer construction materials or products in the following product categories that are substantially -- and demonstrably -- lower in embodied carbon, compared to industry averages for similar materials or products?

Of the priority materials listed, greatest emphasis should be placed on Tier 1 products, particularly low-carbon concrete and steel. Substituting low-carbon versions of these materials has the greatest potential for emissions avoidance as Tier 1 products are more carbon intensive and represent 98 percent of GSA purchasing. Material swapping to a GSA prioritized product

¹ Health Product Declaration Collaborative, Use The HPD. <https://www.hpd-collaborative.org/use-the-hpd/>

that is low-carbon compared to its traditional version but not lower-carbon than the swapped product should be discouraged. GSA should prioritize funding low-carbon procurement for projects that will require the most carbon-intensive materials and possess the greatest opportunity for emissions reduction and avoidance.

These procurement standards will send a powerful signal to the market, spurring the innovation necessary to achieve scale; however, there are near term opportunities for the procurement of low-carbon concrete and steel through methods already market-ready. Concrete manufacturers have many options to reduce the amount of clinker in cement, and increase the amount of supplementary cementitious materials in concrete mix, including calcined clay which is now being produced in the U.S. This process can reduce the amount of the emissions-intensive clinker necessary by 50 percent.

U.S. steel is presently among the cleanest in the world. Steel produced with Electric Arc Furnaces (EAF) utilizing low-carbon electricity offers a near-term source of low-carbon steel while the rest of the market decarbonizes. This is a near-term opportunity and not a long-term solution because domestically produced EAF steel is almost entirely dependent on scrap inputs. These inputs are insufficient in quantity to support the kind of market-demand that programs such as these will create, underscoring the need for continued investment in low-carbon innovation and deployment.

Question 9:

What, if any, are the technical, economic, or regulatory obstacles to reducing the embodied carbon of more of your materials or products?

Technical: While the technology to decarbonize construction materials exists, much of it remains in the pilot phase and globally few net-zero or green projects are operating at scale. This, along with significant upfront costs, means the technologies still carry risks. Public procurement, such as that done by the GSA, will be critical to fostering these transformative technologies, scaling up deployment, and bringing these materials to market.

Economic: Completing EPDs or other reporting mechanisms can have a significant cost, especially for small and medium-size manufacturers. Technical assistance and funding for companies to develop EPDs or other reporting mechanisms are critical to putting in place the necessary disclosure policies to allow level comparisons across construction materials. Financial support such as the \$250 million designated in the Inflation Reduction Act (IRA) for this purpose will greatly reduce the cost to these manufacturers. Further, de-risking technologies will require additional support for research and development, demonstration projects, public awareness programs, and direct incentives for early adopters.

Regulatory: The required carbon intensity benchmark or threshold for public purchasing must set a baseline, focused on specific product and material types, that is significantly, yet achievable more ambitious than the market average. *The Carbon Leadership Forum 2021*

Material Baseline Report identifies three baselines: Achievable (20th percentile), Typical (Median), and Baseline (High), each referring to the amount of embodied carbon in a product.² The IRA requires the GSA to use products “Significantly better than industry average”, making the “Achievable” baseline most appropriate under this framework.

It is also critical to increase stringency over time to encourage continued innovation towards midcentury decarbonization. Public purchasing standards that are too easily achieved or do not change over time will not drive the innovation necessary to fully decarbonize this sector. To that end, these benchmarks also need to be harmonized with international standards.

I³'s coalition of industry stakeholders are here to connect

The information contained within this document represents a small fraction of the collective knowledge and expertise of our participants. Additionally, this document was prepared with the input and feedback of I³ participants but does not reflect the express opinion of each participating organization. Members of I³ are ready and willing to connect with the General Services Administration to provide key industry, labor, environmental, and business perspectives from our stakeholder group. The Initiative meets bi-monthly and is happy to schedule ad hoc meetings to facilitate vital discussions such as these. If you would like to connect with us directly, please reach out to I³ Project Manager, Gabrielle Habeeb, at ghabeeb@gpisd.net, and we will gladly arrange a meeting.

² Carlisle, S., Waldman, B., Lewis, M., and Simonen, K. (2021). 2021 Carbon Leadership Forum Material Baseline Report, (version 2). Carbon Leadership Forum, University of Washington. Seattle, WA. July 2021. [University of Washington ResearchWorks Archive](#).