We envision a future in which glass is the material of choice to enhance spaces where people live, play, learn, work and heal.

May 1, 2023

U.S. Department of Energy
CircularEconomyRFI@ee.doe.gov

Re: RFI FOA-0003059

On behalf of the National Glass Association (NGA), thank you for the opportunity to provide input on the request for information in FOA-0003059 regarding Challenges and Opportunities of Increasing Materials Circularity.

NGA has over 1700 member companies from across North America and the globe. Member companies represent the entire supply chain of the glazing and glass building products industry, from primary glass manufacturers, glass and metal fabricators, insulating glass manufacturers, fabricators/manufacturers of completed glass products and systems, spacers, sealants and other component suppliers, window and door dealers, to the final retail glass businesses and installers/contract glaziers.

As such, we would like to focus our comments on a few key questions in the RFI.

Category B: Life cycle databases and tools used in generating EPD's

B1. How are LCAs or EPDs used to make decisions in your organization?

In the flat glass industry, LCAs & EPDs are done at regional level (usually for multiple facilities with the same process, from one manufacturer in the same region), following the Regional PCR (Product Category Rules). For manufacturers, LCAs can be used to generate "what if" scenarios and help the business understand how technology changes, different energy sources, material changes, etc. can impact the embodied carbon associated with the manufacturing process. For architects and designers, EPDs can be used to influence material selection decisions and calculate the structure's embodied carbon.

B2. If your organization performs LCAs or generates EPDs:

a. *Who generates them and what is the motivation?*
   LCAs and EPDs are generated using a combination of internal subject matter experts (SMEs) and third-party resources (e.g., tools and consultants). The generation of an LCA

and EPD is mainly motivated by market demands and some regulatory schemes can rely on LCA/EPDs as a credible source of information. In the building industry, EPDs are being required by architects, designers, building certification schemes (e.g., LEED) to earn credits/points in their green building ratings, etc.

b. *What is the benefit for you or your organization?*
LCAs can help manufacturers understand which part(s) of the process and materials have the largest contribution to a product's embodied carbon and understand how technology changes, different energy sources, material changes, etc. can impact this (A1, A2, and A3 stages).

c. *What are the challenges?*
Challenges include, but are not limited to:
- Availability of data for A1, A2 and A3 stages.
- Time and resources needed to collect the data, model an LCA and generate / publish an EPD.
- Internal knowledge / know-how about LCA modelling, LCA software and its use, and explaining/interpreting the results
- Cost of modeling software and third-party consultants.
- Availability of third-party consultants.
- The near-impossibility and prohibitive cost of developing EPDs for every possible processed glass assembly considering the infinite combinations of annealed glass, heat strengthened glass, tempered glass, laminated glass with different thicknesses and interlayers, coated glass with hundreds of different coating products, fire-rated glazing, ballistic / blast resistant / security glass with different configurations, bird-friendly glass, acoustic glass, patterned / fritted / etched glass, decorative glass, dynamic glass, vacuum insulating glass, and IGU configurations with different numbers of panes, glass types, glass thicknesses, spacers, sealants, and desiccants. For these reasons, EPD requirements should be currently be based on the primary flat glass, which accounts for the large majority (70% to > 95%) of embodied carbon in processed glass and glazing assemblies.

B3. What tools do you use to perform LCAs/EPDs? Are there barriers to access?

In terms of the LCA, a third-party modeling tool (e.g., GaBi, now called LCA for Experts) is used to perform the assessment. There are other tools accessible online (OneClick LCA, OpenLCA) that can be used. In terms of the EPD, a third-party consultant is used to perform the LCA, then draft the declaration and route it through a third-party verifier for approval before publication. Barriers to access related to tools include, but are not limited to, knowledge / know-how of the LCA / EPD process and tools, consultant availability, and cost of modeling software and consultants.

We support efforts to fund the creation of online EPD generators that would take primary input data to quickly create EPDs for all the variations in product assemblies in a fast and cost-effective manner, although such tools must be carefully vetted by the affected industry.

B4. What are the challenges with regards to LCA methodology? Are ISO standards sufficient to establish LCA methodologies for your specific products/services? If not, why?

Challenges associated with the LCA methodology include, but are not limited to:

- Availability of data for A1, A2 and A3 stages.
- Ability to model LCAs and publish EPDs based on 'mass balance' approaches (e.g., current standards don't allow for manufacturers to model products based on the purchase of renewable electricity through power purchase agreements (PPAs) or credits).
- Ensuring a consistent approach and applicability of the PCR (Product Category Rules) by the entity performing the LCA: each Region (Americas, Europe, etc.) has their own PCR for a category of products like flat glass, so different rules (ex: functional unit) will apply to how the LCA is conducted depending on which PCR is selected.
- Scope of the LCA study, assumptions and quality of data collected will also impact the results: we have Regional EPDs covering multiple facilities (instead of plant-specific), as plant-specific LCA/EPD could potentially disclose proprietary information (specific energy consumption, raw material information) that could lead to back calculations of production costs.

Even though ISO standards exist in this space, there are still differences in how manufacturers model their products and services. Often architects, designers and other entities want to compare LCAs and EPDs, but these differences make it difficult as the data being compared isn't the same.

B5. What are barriers for small/medium/large businesses when generating EPDs? What would be most helpful in reducing these barriers?

Similar to the challenges listed in questions B2 and B3, barriers for small/medium/large businesses generating EPDs include, but are not limited to:

- Availability of data for A1, A2 and A3 (raw materials, transportation from raw material suppliers to manufacturing site, and manufacturing process).
- Time and resources needed to collect the data, model an LCA and publish an EPD.
- Knowledge and know-how in the organization, obtaining and interpreting results.
- Cost of modeling software and third-party consultants.
- Availability of third-party consultants.
- The near-impossibility and prohibitive cost of developing EPDs for every possible processed glass assembly considering the infinite number of combinations. We support efforts to fund the creation of online EPD generators that would take

primary input data to quickly create EPDs for all the variations in product assemblies in a fast and cost-effective manner, although such tools must be carefully vetted by the affected industry.

B7. What would increase manufacturer participation in databases used in generating EPDs such as the US Life Cycle Inventory Database or the Federal Life Cycle Assessment Commons datasets?

There are several databases and datasets available in the US and globally. From a proactivity point of view, manufacturers use the databases included in the LCA Software used, and one of the most renowned/globally used database is EcoInvent. It can be resource intensive to participate in all of these databases and datasets and ensure they get updated when a manufacturer's LCA / EPD is updated. To increase use, it would be helpful if the building industry could align on common tools and databases. Key aspects to consider are how user-friendly is the database, how the data can be integrated from the database in LCA Software and how accurate/recent and representative the data is. For example, electricity datasets would need to be regional and relevant to where a manufacturer's operations /sites are located, otherwise the appropriate 'grid mix' used will not be relevant.

b. What support could be offered to facilitate use?

An awareness / training on existing databases, specific to the construction industry materials datasets would be useful (which datasets are available, how to find the relevant datasets, how to import data in LCA Software, etc.).

B8. What improvements to data are needed for such LCI/LCA databases?

Recommended improvements for the LCI / LCA databases, include but are not limited to:

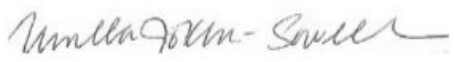
- As mentioned above, more awareness about existing tools and datasets / databases
- Comparison of values with existing datasets (GaBi LCA for Experts, EcoInvent), perform comparative analysis and critical review involving LCA experts who are familiar with LCA Modelling

B9. Please comment any other challenges or opportunities related to LCI/LCA databases or EPDs that AMMTO should be aware of.

Confidentiality of data is very important in the industry. Providing inputs in databases / datasets and using these databases in an LCA (and outcome of LCAs) could potentially lead to disclosing very specific confidential / proprietary information about manufacturing processes. Any new opportunity should consider the risks around what is disclosed, who has access to it, and how this data could potentially be used.

As NGA has such a diverse membership, we encourage DOE to also review any detailed comments that have been submitted by individual members. NGA is in support of DOE's initiatives to foster a circular economy through building materials, and we look forward to continued partnership in improving the built environment in the public's interest.

Sincerely,



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