

1 Triton Square – BREEAM Innovation Credit

Environmental Data Generation –
A Process Innovation

April 2021



ARUP





ARUP

“Having contributed to the industry standards for calculating carbon in construction products more than 10 years ago, for me it’s personally very rewarding to see major clients like British Land supporting SME’s like Maxwood in the creation of lifecycle assessment data for their products. Only once all construction product manufacturers have actual product data consistently calculated can design teams make informed and specific choices in favour of the lowest carbon options.”

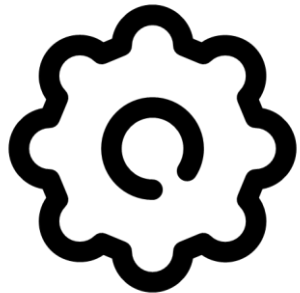
Kristian Steele, Associate, Arup

Purpose: to support the creation of environmental impact data, where they did not exist before, at the point of product procurement.



Aim

The aim of the innovation credit is to use the procurement process as a mechanism to promote the generation of environmental impact data for products to be used on the project. The innovation aims to improve standard practice of environmental impact data generation by upskilling contractors and manufacturers on certification. It represents an exemplar in cross-industry collaboration, transparently sharing the process and lessons learned. Additionally, the process provides another route to encourage more manufacturers to understand the environmental impacts associated with their products.



Context

In standard practice, a products environmental impacts are only rarely considered in procurement. Best practice uses generic environmental profiles and existing environmental product declarations (EPDs) available from manufacturers. Increasingly clients and consultants are requesting environmental impact data to inform design decisions. In this pilot project, new environmental impact data for the product life cycle is developed during the construction procurement process. This proposed process represents a step change in embedding environmental impact data in construction decision-making processes by engaging design and procurement teams in the selection of and collaboration with manufacturers.

This pilot project looks to involve the whole supply chain in the development of environmental impact data through a top-down approach. This is as opposed to the traditional route where a manufacturer may see it as a market need or selling point for their product. This is seen as a process innovation and delivers significant value by proving the concept that you can generate environmental data (leading to an EPD) where none previously existed through the procurement process of construction products.



How

By including the development of product environmental impact data as a requirement during the procurement process, the whole supply chain gained a greater understanding of comparable products' environmental impacts.

For the pilot project the [BRE LINA](#) tool is used to undertake the product life cycle assessment by inputting production data and outputting environmental impact data. The generation of an EPD follows the outlined steps: 1. Data is collected by a manufacturer; 2. The collected data and information is input into LINA; 3. A life cycle assessment report and environmental impact data for the product is produced; 4. The data inputted and life cycle assessment is reviewed and verified by [BRE for an EPD](#). This pilot project covers steps 1 to 3 to produce environmental impact data for two products. A detailed breakdown of the process pursued for the pilot project is presented on the next page.

The Process



Initiation and Procurement

The Lendlease sustainability and procurement team and Arup sustainability consultants worked to ensure that the generation of environmental impact data was included as part of the tender requirements.



Manufacturer Selection

Potential suppliers were identified with the design teams through the supply chain. Maxwood Washrooms were selected as the manufacturer to pilot the process.



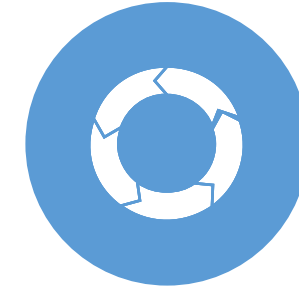
Data Collection

Manufacturing input and output data was collected for two products manufactured by Maxwood Washrooms to be installed on the 1 Triton Square project.



Data Input

Maxwood input their collected manufacturing data directly into [BRE's LINA Life Cycle Assessment Tool](#).



Product Environmental Impact Data

Environmental impact data was generated for two products manufactured by Maxwood Washrooms.

The Process



Initiation and Procurement

- Arup held workshops with the client (British Land) and main contractor (Lendlease) to work through how the requirement to produce product environmental data could be integrated into the procurement process.
- The Lendlease sustainability team worked with their procurement team to include the requirement as part of the tender interviews.
- The Lendlease project team delivered workshops to identify opportunities, having in mind their established relationships within the supply chain.
- An appointed person was needed with the responsibility for implementation and effective delivery of the process.



Manufacturer Selection

- With the project design team, Arup reviewed potential products to be used on the project. Lendlease used this review to identify potential collaborators.
- Working with Lendlease subcontractor BDL, Maxwood Washrooms were selected to be involved in the pilot process.



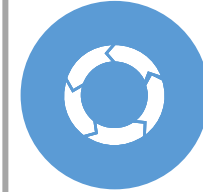
Data Collection

- A site visit was held at the start with Arup and Lendlease to understand the production process and guide Maxwood Washrooms as to what manufacturing data would need to be gathered.
- This includes collection of data for raw material supply and associated transport distances, inputs such as energy and water usage and outputs such as site-generated emissions and waste.
- Input and output data was collected for two products manufactured by Maxwood Washrooms.



LINA Data Input

- Using [BRE's LINA Life Cycle Assessment Tool](#), Maxwood Washrooms input their collected manufacturing data directly into the tool.
- The LINA tool data structure conforms with EN 15804.



Product Environmental Impact Data

- Environmental impact data was generated for two products manufactured by Maxwood Washrooms.
- In LINA, a life cycle assessment and environmental impact data is automatically generated. There is potential to apply for verification [by BRE for an EPD](#).
- The tool can be used for internal benchmarking to improve the production processes.

Project Context

The team involved in piloting the process innovation were as follows:

Client: British Land



Sustainability Consultant: Arup



Contractor: Lendlease



Manufacturer: Maxwood Washrooms



British Land increased the ambition on 1 Triton Square from [BREEAM](#) Excellent to Outstanding. This Innovation Credit was designed and proposed by Arup as part of a package of measures to achieve this ambition. British Land accepted the proposal and agreed to support additional resource in the Arup and Lendlease teams to deliver the Credit. Lendlease and Maxwood Washrooms delivered the Credit with guidance on the process, technical support and liaison with BRE provided by Arup throughout the process.

Conditions for success



ARUP

During the project a number of factors were found to be key to the success of producing environmental data as part of the procurement process, including:

- A proactive design team who sought out, scoped and proposed innovative approaches to improving the sustainability of the project;
- Working with contractors and manufacturers that have values aligned with that of the client and the project aims. A mutual understanding of the aim (in this case greater transparency regarding environmental data) in the industry is crucial;
- Demonstrating the value of the process to the manufacturer at an early stage;
- Enthusiasm is needed from the whole team, from the client driving the process to the contractor's procurement team and the potential manufacturer;
- Location of the manufacturer: selecting a local manufacturer enables a strong relationship to be developed, facilitated by factory visits, ensuring knowledge and ownership could be successfully transferred to the manufacturer; and
- Having a dedicated resource in Lendlease to identify the manufacturer and a dedicated resource in Maxwood Washrooms to collect the data and input into the tool.

“We are always seeking to improve our processes, so when we were approached by Lendlease with the opportunity to collaborate on this innovation credit, we were very keen to take part. The study highlights clear efficiencies we can make but more importantly, it enables us to better support key clients with their ambitious sustainability targets. We are already seeing a sharp uptick in the number of architects and clients requesting environmental impact data.”

Maxwood Washrooms

Lessons Learnt and Next Steps



Procurement

- The length and stability of the supply chain needs to be considered. For this project, Lendlease worked with their subcontractor BDL, with whom they had an existing relationship, to identify manufacturers willing to be involved in the process. Often the manufacturer of the product will be many more steps removed from the main contractor.
- While Lendlease started discussions with a number of potential subcontractors, several were not interested or did not have sufficiently strong relationships with manufacturers to have confidence they could successfully engage in the process.
- It is critical to include the requirement as early as possible into the procurement process. Ensuring that the procurement team are on board and have a good understanding of the goal is crucial. Requirements should be included in the tender documents and potential collaborators should be briefed from the start to ensure that there is a full understanding of the process and potential time and effort required. Requirements could also be included as part of client supply chain charters setting expectations for the whole supply chain.



Manufacturer Selection

- The selection criteria was to work with a manufacturer that had not previously conducted a life cycle assessment and that had a relatively few components in their product, mitigating complexity risk for what was a trial process. The team now has experience to take forward life cycle assessments with multiple sites and production lines.
- The requirements of the manufacturer need to be clear from the start so that they understand what the process involves. Collection of manufacturing data is not a simple process, meaning thought must be given to the resources and time needed for the collection process. The manufacturer needs to have a detailed brief to ensure there is a full understanding of what a life cycle assessment is and what level of information and data collection required.



Lessons Learnt and Next Steps

Data Collection

- Continuous engagement throughout the process is required with the manufacturer.
- The data collection is time consuming and complicated, particularly in facilities which manufacture more than one product. A clear and comprehensive end-to-end data collection process needs to be put in place from the start, and each input needs its own data collection strategy.
- Maxwood Washrooms learnt that a greater benefit could have been realised from engaging more of the manufacturing team into the data collection process. This would allow for more efficient data collection and a greater awareness in the company around the environmental impacts of the manufacturing process.

Data Input

- From the project it was highlighted that the [BRE LINA tool](#) is intuitive to use and has detailed explanations for each input requirement. This made the process easy from the Maxwood Washrooms' point of view, who had no prior life cycle assessment experience.
- It is recommended that the manufacturer and contractor start using such a tool from the point of manufacturer selection to ensure that they have a thorough understanding of the life cycle assessment process.

Product Environmental Impact Data

- Possible next steps in the process could be; 1. Maxwood verify their life cycle assessments with [BRE to gain a verified EPD](#), 2. Maxwood encourage their supply chain to go through same process and 3. Other manufacturers follow this process. This is explored in more detail on the following page.



Future Development



There are a number of next steps that can be made from the current work, these are:

- Maxwood verify their life cycle assessments with [BRE to gain a verified EPD](#);
- Maxwood encourage their supply chain to go through same process. This would allow for more accurate datasets to be used in the life cycle assessments conducted by Maxwood Washrooms. Currently generic data sets have been used for input materials;
- British Land and Lendlease adopt the process as part of their supply chain management processes; and
- Arup propose the same process to other clients and introduce into other projects.

Benefits

- The use of the procurement process to accelerate the creation of environmental data and EPDs in developers and main contractors supply chain.
- Traditionally there is a large expense associated with generating environmental data and verified EPDs. Looking at the market many large manufacturers already have environmental data and verified EPDs. Including the generation of environmental data or EPDs as part of the procurement process offers an incentive to the manufacturer. This paired with a product life cycle assessment tool such as [LINA](#) offers an opportunity for SMEs to understand their products environmental impact.

“At Lendlease we are committed to leading the evolution of our industry to be truly sustainable. Having the environmental data for the materials we install helps us significantly reduce or eliminate our carbon impact as we do our part to mitigate climate change. We look forward to working very closely with our clients, design teams and supply chain partners as we use this process to support wider industry transformation.”

Simon Gorski, Managing Director, Construction, Lendlease



“We have committed to transforming our portfolio to be net zero carbon by 2030. To achieve this target, we need all our suppliers, large and small, to provide us with data on the environmental impact of their products. Arup, Lendlease and Maxwood Washrooms have done a great job of showing it can be done, and BRE’s LINA tool significantly simplified the process. We are planning to use this method on our other projects to accelerate change throughout our supply chain.”

Tim Downes, Development Director, British Land

Roles and responsibilities

British Land appointed Arup to support Lendlease and Maxwood Washrooms in the process innovation for the innovation credit for BREEAM accreditation. Arup supported Lendlease in selecting the manufacturer to collaborate with and supporting the manufacturer to understand the life cycle assessment process and requirements. The collection of data and review of the data input into the LINA is the responsibility of Maxwood Washrooms. This data has not been verified by BRE.



For further information, please contact:

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