Department for Levelling Up,
Housing & Communities

Statement of Requirements (Draft)

Measurement and Reduction of Embodied Carbon in New Buildings (CPD4124072)

Future Opportunities Notice

1. SCOPE OF REQUIREMENT

1.1 Through the contracted work, The Authority is seeking to establish detailed baselines on matters regarding WLCAs and reduction of embodied carbon in new buildings to inform policy development. The work has been divided into the below six in-scope areas:

1) The robustness of WLCAs, uncertainties in data used and their results and the challenges that creates for decision-making.
2) The impacts to business of carrying out WLCAs.
3) The supporting structure and data needed for WLCAs.
4) The design and construction choices that are made following WLCAs.
5) The appropriate and cost-effective areas for carbon savings and the relative savings available.
6) The design and material choices that would be encouraged by embodied carbon reduction and the impacts of those choices.

1.2 Across these six areas, the work will need data gathering and analysis, technical and practical modelling, and economic analysis in line with Green Book and related methodology and requirements. Also in scope are the possibilities of support for a public consultation and production of impact assessments.

1.3 Given the range work required, especially the inclusion of economic analysis, the Authority expects that many bidders will need the support of external contractors or consortium partners to ensure relevant expertise.

1.4 As this is a developing area of policy the Authority intends for the contract to have a call-off element to allow additional (or changed) work. This could be influenced either by results from earlier work under the contract or policy development by the Authority.

2. BUDGET AND TIMELINE

2.1 The maximum budget for the contract will be £250,000 (exc. VAT). Within that budget, the Authority intends that up to £50,000 (exc. VAT) will fund the call-off elements (see para 1.4).

2.2 The contract is likely to begin in March 2023 and run until March 2024.

3. THE REQUIREMENT

3.1 Further detail on the six areas of research and expected outputs is in Table A 'Detail of Requirements and Outputs' below.

3.2 While the Authority expects there to be overlap between the six areas of research – both in terms of timing and work done – there are some areas and outputs that will need early work to inform the latter research. In particular, the Literature Review of existing WLCAs across building types will be key to identifying the appropriate set of building types for further analysis in latter outputs.

3.3 This means that, to some extent, the boundaries and scope of some outputs may need to be refined once the contract has started.

3.4 Given the overlap between the areas of research, there will be the chance for the successful bidder, after discussion with the Authority, to combine some of the below outputs.

Table A – Detail of Requirements and Outputs			
	Area of Work	**Description**	**Outputs**
1	**The robustness of WLCAs, uncertainties in data used and their results and the challenges that creates for decision-making**	For decisions to be made on interventions to reduce embodied carbon, we must increase the whole life carbon data available to industry and Government. As part of this, we need to understand the range and levels of uncertainty of WLCAs at various project stages. This data will tell us at a micro-level what the major problem points are, what best practice looks like and, at a macro-level, where there are possible barriers across the construction market. However, there is always uncertainty baked into WLCAs as they are started during the design stage before final decisions are made on materials or processes to be used. Our review of some existing WLCAs shows exact carbon figures used at early stages when specifics can't be known to this level of detail and with little acknowledgement or accounting for this uncertainty. Research is needed into where in the process those uncertainties lie, whether those are the same across different building types, etc., and what is needed to resolve or report those uncertainties so that we can be reassured that WLCAs are proportionately robust for the stage of construction.	**Output 1a** • Literature review of WLCAs across a range of building types to help feed into a proportionate set of building types for more detailed analysis and policy development (as is carried out for Part L impact assessments). **Output 1b** • Literature review of existing benchmarks and targets for embodied carbon content across building types. **Output 1c** • Literature review of research already undertaken that identifies the cost implications of building with reduced embodied carbon. **Output 1d** • A qualitative assessment of the uncertainties in the data and results of WLCAs. This should include the causes of these uncertainties, when and how they are resolved (i.e., from a WLCA being updated throughout construction), what uncertainties are built in to a WLCA and can't be resolved (e.g., we can't know at construction what will happen at the end-of-life stage), the relative impact of the uncertainties on the assessment result, and any significant differences in the uncertainties seen in WLCAs of different building types. **Output 1e**

			• If appropriate, a corresponding quantitative assessment of the uncertainties identified in Output 1d. **Output 1f** • A quantitative assessment of existing UK public databases of WLCAs, their robustness and gaps in building types, products, construction methods, etc.
2	**The impacts to business of carrying out WLCAs**	A WLCA is an involved process done in stages throughout the design and construction of a project. While a large developer may have the in-house expertise to carry out WLCAs, an SME might need to hire consultants or tools per project. Through stakeholder engagement, we have heard quotes for WLCAs ranging from £2,000 - £15,000. It has been suggested this range could be down to varying client requirements and size or complexity of development. In some cases the cost could be significantly higher than this range, in response to specific planning requirements, especially if complex energy modelling is required. These costs change the bottom-line developers are working to, and we wish to understand the cost, time, resource (and any other) impacts of carrying out WLCAs for different developer types and sizes in detail. This includes the project and programme level impacts, such as delivery timelines and the need for redesigns. Alongside this, the market must be capable of delivering enough robust WLCAs to support an increased demand for assessment. Research into the state of the market should evaluate its readiness and ability, or lack thereof, to meet an increase in demand.	**Output 2a** • A costed report on the impacts to business of carrying out WLCAs. This should consider developer size, cost, time, resource, impact on project timelines. It should also consider the "type" of WLCA being carried out (e.g., a WLCA by consultant appointed to a project, or a WLCA by a designer to inform their work). This work should be of sufficient quality to feed into a published impact assessment and align with Green Book and related methodology and requirements. **Output 2b** • A quantitative report on sector-wide economic impact of widespread WLCAs. This should include an assessment of the availability of skills in the market to carry out WLCAs and the cost and time needed to train people to carry out WLCAs.
3	**The supporting structure and data needed for WLCAs**	Sitting behind WLCAs are Environmental Product Declarations (EPDs) that give information on the environmental performance and impacts of materials used. If there is not an EPD for a specific product, the WLCA may rely on generic data for that type of product, giving a potentially misleading overall result. There are	**Output 3a** • A qualitative report on the carbon data availability of construction products following the carbon data sources ranking in the *RICS Professional Statement: whole life carbon*

		questions about whether there is the critical mass of EPDs needed for the results of WLCAs to be valuable both to industry and to Government in using results to inform policy. While increasing the carbon data available for products is BEIS-led, DLUHC needs information on the state of EPDs for construction products. Once a WLCA is done, the results should be logged and reported so that they can be compared to the results of similar projects and an understanding developed of "what good looks like". Some confirmatory research is needed into the existing mechanisms for this in the market. This could include an assessment of policy and systems used internationally and their applicability to the UK market.	*assessment for the built environment*. This should be a sampled assessment scaled to provide a likely market-wide view. **Output 3b** • A qualitative report on the existing tools for carrying out WLCAs and mechanisms for reporting the results of WLCAs.
4	**The design and construction choices that are made following WLCAs**	Research is needed across a wide range of building types and projects into whether carrying out WLCAs has affected the choices made at the design and/or construction stages and what the practical, economic and carbon impacts of those changes have been.	**Output 4a** • Based on the review in Output 1a, a qualitative report on design and construction choices made following WLCAs accompanied by quantitative assessments of the project-level financial and carbon impacts of those choices. ○ *Note that on discussion with the successful bidder, it may be decided that this output can be incorporated into Output 5a.*
5	**The appropriate areas for carbon savings and relative savings available**	Once complete, a building has drawn on many supply chains, manufacturing and construction processes and consists of many materials. These aspects will differ across building types and site layouts. While there is a presumption that there are big-ticket carbon items (e.g., on the material side: concrete and steel, and on the building-type side: high-rises or other buildings with deep foundations), a more thorough understanding is needed of where the embodied carbon lies across industry, across building types and, following that, where the relative and viable potential for carbon savings lie.	**Output 5a** • A report on methods for reducing embodied carbon across building types considering all embodied carbon inputs, not just products. This should include: ○ Abatement Cost Curves: carbon savings and £/tonne cost of the most common methods of reducing embodied carbon. For different building

6	**The design and material choices that would be encouraged by embodied carbon reduction policy and incentives and the impacts of those choices**	There are plenty of ways to build with reduced embodied carbon. Some, however, will not be suitable for widespread use across the sector, as they will be too costly or innovative. We therefore need to understand what short- and long-term changes are likely to occur across the whole industry if there were widespread efforts to reduce embodied carbon. Large changes in construction practices or material use could have unintended consequences on building safety, the housing market, other economic sectors, regions of the country, the job market, etc. Another area for research is the potential effects that quick or widespread adoption of novel or niche materials could have on the mortgage and insurance markets. A key consideration will be the potential implications on building energy performance and safety that changes in design and material choices may have. For example, increasing the use of timber may have safety implications, and use of low-carbon products or different construction methods may result in less material being used, an unintended consequence of which could be weakening the structural integrity of buildings.	types (informed by types identified in Output 1a). ○ Micro and macro impacts of those methods: e.g., on building energy performance, on structural integrity, on supply chains, etc. **Output 6a** • A qualitative report on the international use of timber in construction, the regulatory systems that govern this in countries and applicability/lessons to learn for the English market.

4. ADDITIONAL WORKS

4.1 At the time of publication of this procurement exercise, it is not known if the Authority will need the supplier to provide additional outputs to those listed in Section 3. Additional outputs may be needed depending on the results of earlier outputs and the Authority's ongoing policy development. If additional outputs are needed, the supplier will be notified at least one month before further work is required.

4.2 The decision not to proceed with additional outputs will not impact core deliverables in Section 3. All deliverables will take place with contract expected to end in March 2024.

4.3 Should the Authority request additional outputs, this could include:

- Literature reviews,
- Data collection and analysis,
- Qualitative and quantitative reporting,
- Economic analysis in line with Green Book guidance.

5. PHASES AND INIDICATIVE DELIVERY DATES

Phase	Outputs (see description above in Table A)	Indicative Delivery Date
Phase 1	Outputs 1a and 2a	FY 23/24 Q1
	Outputs 1d, 1e, and 2b	FY 23/24 Q1
Phase 2	Outputs 1b, 1c, and 1f	FY 23/24 Q1
	Outputs 3a and 3b	FY 23/24 Q3
	Draft/Early findings for Output 5a	FY 23/24 Q3
Phase 3	Output 4a	FY 23/24 Q4
	Output 5a	FY 23/24 Q4
	Output 6a	FY 23/24 Q4