

Additional written evidence from CIBSE (Chartered Institution of Building Services Engineers)

CIBSE response to oral submission

Reasons for submitting a response

§1 – This document provides CIBSE’s response to the following comment made in a recent oral submission to the EAC, which has been raised to our attention: *“We have a particular area of concern in relation to building services, so there is very little environmental product declaration data in respect of building services. CIBSE have produced a methodology called TM65, which is a complex methodology for measuring embodied carbon in building services. This needs master’s level people to do this. We need to be doing this at a lower level. The manufacturers all need to produce their EPD for A1 to A3 from the methodology, which is raw material extraction, transport to factory, and manufacturing. That data can then be incorporated into the RICS model by people who do not have a master’s level of technical education.”*

The TM65 methodology

§2 – CIBSE TM65 - *Embodied Carbon in Building Services – A Methodology*, was published in early 2021. It was developed by Elementa Consulting, contracted by CIBSE, who engaged a large number of manufacturers in the process, as well as a steering group.

§3 - CIBSE agree with the statement that there is currently very little environmental product declaration (EPD) data with regards to building services. This lack of data is precisely what CIBSE TM65 intends to address.

§4 – The TM65 methodology does NOT intend to replace EPDs. Several sections of TM65 (Section 3 and Appendix A) in fact are about EPDs, to provide guidance on what they are, how to use them, the different types of EPDs, how to create one, where to find EPDs for building services products, how to compare them etc. CIBSE have been advocating for a number of years that building services engineers should request EPDs from manufacturers (for example in CIBSE guidance including TM56 – *Resource Efficiency*, 2014 and Guide L – *Sustainability*, 2020), in order to:

- Inform their design and product selection if the EPDs are available

- Show there is demand for EPDs and encourage manufacturers to produce them, where they are not yet available.

§5 - However, since EPDs are still not common for building services, the very purpose of TM65 is to provide a simple route for manufacturers and building services engineers to estimate and report on the embodied carbon of building services products through simpler methods, when EPDs are not available. TM65 proposes 3 levels of embodied carbon calculation:

- 1 – EPDs: recommended, to be requested from manufacturers
- 2 – if EPDs are not available, a “mid-level” calculation
- 3 – if information required to do the mid-level calculation is not available, a “basic” calculation.

§6 – The “basic” calculation only includes 5 steps and requires information on:

- product weight (kg)
- material composition breakdown for at least 95% of the product weight (excluding refrigerant charge)
- type and quantity of refrigerant within product (kg), if relevant
- product service life (years); if the manufacturer does not supply this information, values from CIBSE Guide M (2014/2019) can be used.

§7 – For many building services products, composed mainly of 1 or 2 metals, this means only requiring the product weight and what its 1 or 2 main materials are. This is fairly limited information.

§8 – The “mid level” calculation requires additional information such as energy used in manufacture and the location of the final assembly factory (not whole supply chain).

§9 – The Appendix (from TM65) illustrates the varied degrees of information required to do the calculation. EPDs, clearly, require additional information. Therefore we agree with the comment that EPDs should be used if available, but the reality is that often they are not, and TM65 proposes simpler routes in that case, with minimal information required from manufacturers.

§10 – Once the inputs from the manufacturer have been obtained, the methodology is very simple (additions and multiplications), using default values provided by TM65.

§11 - CIBSE are working on a tool (a simple spreadsheet) incorporating the methodology, to make it even simpler in the future for users, but many companies have already engaged actively with the methodology and produced their in-house tools (i.e. spreadsheets).

§12 - TM65 is referenced in the upcoming Greater London Authority Whole Life Carbon assessment guidance, which is evidence of support and should help drive industry to embrace it.

Upskilling and support to industry

§13 – CIBSE are well aware of the need for upskilling in this area, as well as other areas in the built environment; this is the reality of what is needed to achieve Net Zero, so we better understand our impact and apply the best solutions to reduce them. We believe the upskilling required to use TM65 is minimised for its purpose, and can be shared across consultants and manufacturers, depending on their resources and willingness to engage.

§14 – CIBSE have organised events and are providing training where attendees can learn not only about the TM65 methodology, but also more generally factors that affect embodied carbon in building services.

§15 – These events have included:

- 3 webinars (the launch, a recording of the launch, the methodology, which attracted 2570 registered individuals, 1500 attendees, and a further 140 viewings of the recording).
- 3 training courses (2 public, 1 corporate), with over 60 attendees.

Industry feedback

§16 – TM65 has received very positive feedback. Since its release early 2021, it has been downloaded 1712 times, higher than any other publication this year and with only TM40 *Health and Wellbeing in Building Services*, CP1 *Code of Practice for Heat Networks* and the Guides coming close to this number.

§17 - CIBSE have clearly stated that TM65 will evolve with industry feedback.

§18 - We are surprised at the comments raised with the EAC, as they were not raised with us directly and they do not align with the feedback we have received from consultants, manufacturers and supply chains.

§19 - By contrast, the feedback we have received from manufacturers and the wider industry has been very positive, for example:

- *“Actuate UK welcomes CIBSE guide to embodied carbon in building services”* (Note: Actuate is an engineering alliance including trade bodies)
- Mitsubishi are now using it to calculate the embodied carbon impact of their products, see for example: <https://library.mitsubishielectric.co.uk/pdf/book/CMB-WM108V-AA-TM65-Calculation#page-1-2>
- Stoane Lighting have confirmed that they are using the TM65 method to calculate the embodied carbon of their standard products. *“At Stoane Lighting we think TM65 is essential. It’s a stepping stone to a full EPD that can be used by companies hesitant to invest here until there is a harmonised methodology...”*
- LinkedIn comment, individual from Sweco: *“This is a really important step. I wonder how the results will impact on equipment and system selection in the future?”*
- LinkedIn comment, individual from SDS: *“This document is up there with the most important guidances in the race to #2050”*

§20 - These are just a few examples, we would be happy to provide more testimonials if useful.

§21 - As a further step to improve understanding and reduce the carbon impact of building services, CIBSE are now applying TM65 to do systems (rather than just products). This has led to TM65.1, on residential heating systems, for which 29 different manufacturers shared in total 70 datapoints. In return, they were able to learn from it as they could see (anonymously) how their product compared against others.

§22 - Most recently, on 2nd November 2021 we organised a workshop for manufacturers to engage with the next steps of our work, on embodied carbon in office building services systems. It was very well attended, with 160 attendees, and received very positive feedback on the method and our follow-up work (e.g. "*great session*", "*very informative*"), with requests for more regional sessions.

Contact

§23 - We are very supportive of the work of the EAC and would be very happy to provide more information to the EAC if useful, and to engage with the organisation or individual who raised their concerns with the EAC, should they wish to contact us.

§24 - We understand this response may be made public (e.g. on the EAC inquiry website), and do not object to it.

Dr Julie Godefroy, CIBSE Head of Sustainability

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APPENDIX – Comparison of input requirements: EPD, TM65 “mid-level” and TM65 “basic” calculations

Table 4.1 Comparison of the life cycle stage modules needing to be calculated and the type of information required per life cycle stage module for the two calculation methods and an EPD

Preliminary information		'Basic' calculation	'Mid-level' calculation	BS EN 15804+ A2 compliant EPD*
Capacity of equipment /size		Mandatory	Mandatory	Mandatory
Product service life (years)		Mandatory	Mandatory	Optional
Refrigerant used, GWP, charge (kg)		Mandatory	Mandatory	Mandatory
Stage	Module	'Basic' calculation	'Mid-level' calculation	BS EN 15804+ A2 compliant EPD*
A	A1 (material extraction)	Mandatory	Mandatory	Mandatory
	A2 (transport to factory)	Scale-up factor	Mandatory	Mandatory
	A3 (manufacturing)		Mandatory	Mandatory
	A4 (transport to site)		Mandatory	Optional
	A5 (installation)	—	—	Optional
B	B1 (use)	Mandatory for refrigerant based system	Mandatory for refrigerant based system	Optional
	B2 (maintenance)	Scale-up factor	Optional	Optional
	B3 (repair)	Mandatory	Mandatory	Optional
	B4 (replacement)	—	—	Optional
	B5 (refurbishment)	—	—	Optional
	B6 (operational energy)	—	—	Optional
	B7 (operational water)	—	—	Optional
C	C1 (deconstruction)	Mandatory for refrigerant based system	Mandatory for refrigerant based system	Mandatory
	C2 (transport)	Scale-up factor	Mandatory	
	C3 (waste processing)		Mandatory	
	C4 (disposal)		Mandatory	
D	D (reuse, recover, recycle)	—	—	

* Compliant with BS EN 15804:2012+ A2:2019, therefore modules C and D are mandatory whereas they are optional for BS EN 15804:2012+ A1:2013

END OF SUBMISSION