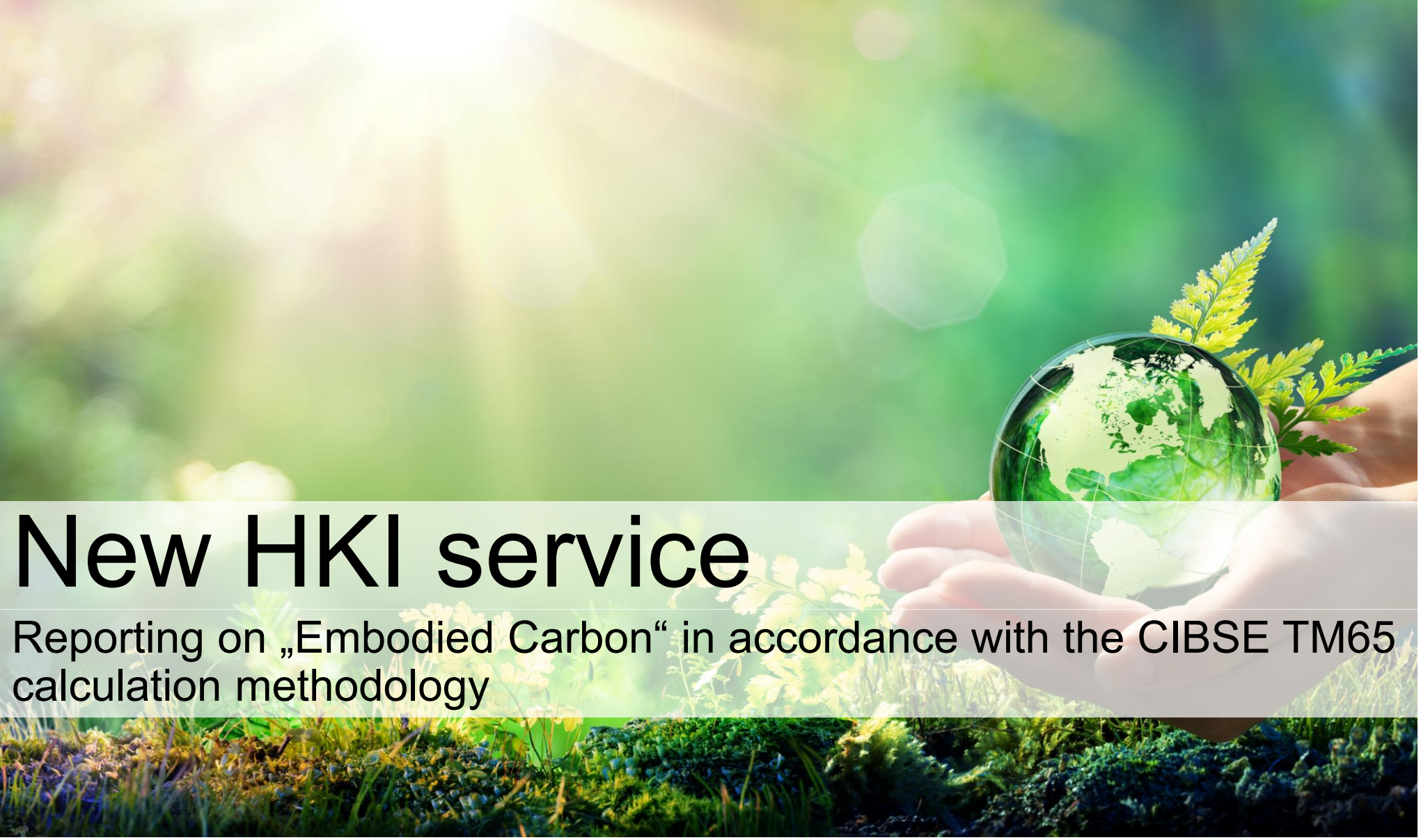


New HKI service

Reporting on „Embodied Carbon“ in accordance with the CIBSE TM65 calculation methodology

Fabian Anzmann

January 20, 2026

TM65 calculation method (CIBSE[1])

- In the UK market, there is growing demand from consultants for reliable sustainability information on commercial kitchen appliances.
- Particularly in demand is the CO_2 footprint „Embodied Carbon" of the appliances, calculated according to CIBSE's TM65 calculation method
  - The calculation method is based on the document:
    "*Embodied Carbon in Building Services: A Calculation Methodology (Jan 2021)*"
    - Further information: Embodied carbon in building services: a calculation methodology (TM65) | CIBSE
- The TM65 calculation method only considers the "embodied carbon footprint."
  - Does not consider operational carbon
    →Energy consumption incurred during the use of the equipment is not taken into account
  - The TM65 calculation method is actually intended for building products

Not really suitable for commercial kitchen appliances,
but it is a requirement on the UK market

[1] CIBSE = Chartered Institution of Building Services Engineers

Assistance from the association

- Development of a pragmatic solution for the provision of the "embodied carbon" according to the TM65 method
  - Collaboration with the service provider Kiwa Ecobility Expert
- Calculation tool that determines the embodied carbon of a commercial kitchen appliance according to the TM65 method as defined by CIBSE
  - Depending on data availability, the manufacturer can choose between the ***basic method*** or the ***mid-level method***:
    - ***The basic method*** is based on conservative assumptions and may lead to higher results than the ***mid-level method,*** which requests more information
  - Static data collected on June 5, 2025 is used to calculate the environmental impact
    - The data comes from the ICE[1] Database 4.0 and from the specifications in the document "Embodied Carbon in Building Services: A Calculation Methodology (Jan 2021)"

[1] ICE = Inventory of Carbon and Energy

Basic method

- Data collection is carried out via an Excel spreadsheet (data collection form)
  - General information
    - Manufacturer (name)
    - Manufacturer (address)
    - Name of the authorized person who provided the data

  - Information on the device:
    - Product name
    - Product weight (kg)
    - Product capacity (kW)
    - Product service life (years)
    - Refrigerant use (if any) (dropdown)
      - No refrigerant
      - R290
      - R448a
      - R449a
      - R452a
      - R513a
      - R600a
      - Other refrigerant (average value)
    - Refrigerant charge (kg)

  - Material composition

Mid-level method

- Data collection is carried out via an Excel spreadsheet (data collection form)
  - General information
    - Manufacturer (name)
    - Manufacturer (address)
    - Name of the authorized person who provided the data

  - Information on the device:
    - Product name
    - Product weight (kg)
    - Product capacity (kW)
    - Electricity consumption per unit of product (kWh)
    - Product service life (years)
    - Refrigerant use (if any) [dropdown]
      - No refrigerant
      - R290
      - R448a
      - R449a
      - R452a
      - R513a
      - R600a
      - Other refrigerant (average value)
    - Refrigerant charge (kg)
    - Location of factory carrying out final assembly [dropdown]
    - Transportation scenario for A4 (Transportation from production (location to customer location) [dropdown]

  - Material composition

Mid-level method

- Data collection is carried out via an Excel spreadsheet (data collection form)
  - General information
    - Manufacturer (name)
    - Manufacturer (address)
    - Name of the authorized person who provided the data

  - Information on the device:
    - Product name
    - Product weight (kg)
    - Product capacity (kW)
    - Electricity consumption per unit of product (kWh)
    - Product service life (years)
    - Refrigerant use (if any) [dropdown]
    - Refrigerant charge (kg)
    - Location of factory carrying out final assembly [dropdown]
      - Africa
      - Asia
      - Australia
      - Canada
      - EU
      - Middle East
      - South America
      - UK
      - US
    - Transportation scenario for A4 (Transportation from production (location to customer location) [dropdown]

  - Material composition

Mid-level method

- Data collection is carried out via an Excel spreadsheet (data collection form)
  - General information
    - Manufacturer (name)
    - Manufacturer (address)
    - Name of the authorized person who provided the data

  - Information on the device:
    - Product name
    - Product weight (kg)
    - Product capacity (kW)
    - Electricity consumption per unit of product (kWh)
    - Product service life (years)
    - Refrigerant use (if any) [dropdown]
    - Refrigerant charge (kg)
    - Location of factory carrying out final assembly [dropdown]
    - Transportation scenario for A4 (Transportation from production (location to customer location) [dropdown]
      - Locally
      - Nationally
      - European
      - Globally

  - Material composition

Material composition

- The material composition must be provided for both the basic method and the mid-level method.
  - Borosilicate glass
  - Brass
  - Cast iron
  - Ceramic
  - Copper
  - Iron
  - Elastomers
  - Glass
  - Glass ceramic
  - Lithium
  - Insulation materials (mineral)
  - Electronic components (WEEE)
  - Stainless steel (Cr, other alloys negligible)
  - Stainless steel (Cr/Ni, other alloys negligible)
  - Plastics (other)
  - Polyamides (PA)
  - Polycarbonates (PC)
  - Polyethylene (PE)
  - Polypropylene (PP)
  - Polystyrene (PS)
  - Polyurethane (PU)
  - Polyvinyl chloride (PVC)
  - Silicone
  - Steel
  - Wood
  - Remaining materials (considered as steel according to TM65)

Data Collection Form

Please read the following before filling out this Excel spreadsheet:

1. This excel spreadsheet is used to calculate the embodied carbon according to the TM65 method from CIBSE "Embodied carbon in building services: A calculation methodology (Jan 2021)".

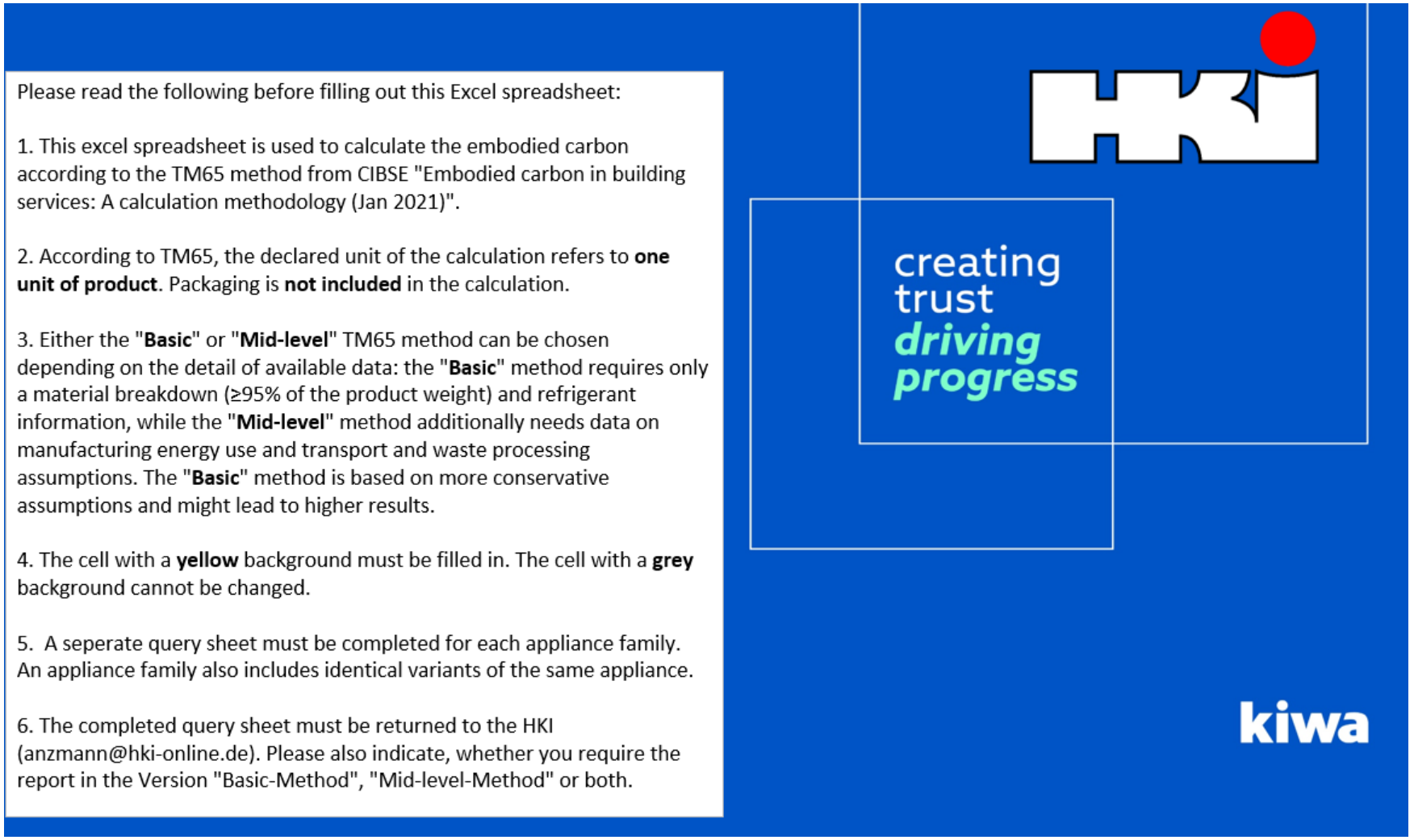
2. According to TM65, the declared unit of the calculation refers to **one unit of product**. Packaging is **not included** in the calculation.

3. Either the "**Basic**" or "**Mid-level**" TM65 method can be chosen depending on the detail of available data: the "**Basic**" method requires only a material breakdown (≥95% of the product weight) and refrigerant information, while the "**Mid-level**" method additionally needs data on manufacturing energy use and transport and waste processing assumptions. The "**Basic**" method is based on more conservative assumptions and might lead to higher results.

4. The cell with a **yellow** background must be filled in. The cell with a **grey** background cannot be changed.

5. A seperate query sheet must be completed for each appliance family. An appliance family also includes identical variants of the same appliance.

6. The completed query sheet must be returned to the HKI (anzmann@hki-online.de). Please also indicate, whether you require the report in the Version "Basic-Method", "Mid-level-Method" or both.



Data Collection Form

Embodied Carbon Calculation

based on the "Basic" calculation method of TM65

Manufacturer (Name)	
Manufacturer (Adress [Street and Nr.])	
Manufacturer (Adress [Postcode City, Country])	
Name of the person making the request (First name and surname)	
Product Name	
Type of product	Commercial kitchen appliances
Product weight (kg)	
Product capacity (kW)	
Product service life (years)	
Refrigerant used (if any)	
Refrigerant charge (kg)	

Dropdownfield

Material Composition Note: Material breakdown for at least 95% of the product weight (excluding refrigerant charge) must be provided	
Material Composition	Weight of materials (kg)
Borosilicate glass	
Brass	
Cast iron	
Ceramic	
Copper	
Electronic components (WEEE)	
Elastomers	
Glass	
Glass ceramic	
Insulaton materials (mineral)	
Iron	
Lithium	
Plastics (other)	
Polyamide (PA)	
Polycarbonate (PC)	
Polyethylen (PE)	
Polypropylene (PP)	
Polystyrene (PS)	
Polyurethane (PU)	
Polyvinyl chloride (PVC)	
Silicon	
Stainless steel (Cr, other alloys negligible)	
Stainless steel (Cr/Ni, other alloys negligible)	
Steel	
Wood	
Remaining materials (considered as steel according to TM65)	

Sum (kg)	0,00
Mass balance control	The mass balance is correct

Embodied Carbon Calculation

based on the "Basic" calculation method of TM65

Manufacturer (Name)		
Manufacturer (Adress [Street and Nr.])		
Manufacturer (Adress [Postcode City, Country])		
Name of the person making the request (First name and surname)		
Produduct name		
Type of product	Commercial Kitchen Appliances	
Product weight (kg)		
Product capacity (kW)		
Product service life (years)		
Refrigerant used (if any)		*Dropdownfield*
Refrigerant charge (kg)		
Electricity consumption per unit of product (kWh)		
Location of factory carrying out final assembly		*Dropdownfield*
Transport scenario for A4 (Transport from production location to customer location)		*Dropdownfield*

Material Composition Note: Material breakdown for at least 95% of the product weight (excluding refrigerant charge) must be provided	
Material Composition	Weight of materials (kg)
Borosilicate glass	
Brass	
Cast iron	
Ceramic	
Copper	
Electronic components (WEEE)	
Elastomers	
Glass	
Glass ceramic	
Insulaton materials (mineral)	
Iron	
Lithium	
Plastics (other)	
Polyamide (PA)	
Polycarbonate (PC)	
Polyethylen (PE)	
Polypropylene (PP)	
Polystyrene (PS)	
Polyurethane (PU)	
Polyvinyl chloride (PVC)	
Silicon	
Stainless steel (Cr, other alloys negligible)	
Stainless steel (Cr/Ni, other alloys negligible)	
Steel	
Wood	
Remaining materials (considered as steel according to TM65)	

Sum (kg)	0,00
Mass balance control	The mass balance is correct

Example for a report (Mid-level)

Report on the embodied carbon according to the TM65 method from CIBSE "Mid-level" calcuation method

Report Number	HKI-TM65-25-0000	Issue Date	09.10.2025

Details on the Manufacturer	**Authorised to represent**
Musterfirma GmbH Musterstraße 1 12345 Musterstadt, Deutschland	Max Mustermann

Appliance Details

General Information

Product Name:	Thermo 1000 (Fritteuse)	**Electricity comsumption per unit of product (kWh):**	80
Type of Product:	Commercial kitchen appliances	**Location of factory carrying out final assembly:**	EU
Product weight (kg):	150	**Transport scenario for A4 (Transport from the gate to the site):**	European manufactured
Product capacity (kW):	20	**Replacement of components (%):**	10
Product service life (years):	10	**Product complexitiy:**	Category 2: Medium complexity
Refrigerant use (if any):	No refrigerant		
Refrigerant GWP (kg CO2e/kg):	0		
Refrigerant charge (kg):	0		

Example for a report (Mid-level)

Report on the embodied carbon according to the TM65 method from CIBSE
"Mid-level" calcuation method

Material Compostion

Note: Material breakdown for at least 95% of the product weight (excluding refrigerant charge) must be provided

Material	Weight of Materials (kg)
Borosilicate glass	0,00
Brass	0,00
Cast iron	0,00
Ceramic	0,00
Copper	5,00
Electronic components (WEEE)	5,00
Elastomers	0,00
Glass	0,00
Glass ceramic	0,00
Insulaton materials (mineral)	10,00
Iron	0,00
Lithium	0,00
Plastics (other)	5,00

Material	Weight of Materials (kg)
Polyamide (PA)	0,00
Polycarbonate (PC)	0,00
Polyethylen (PE)	0,00
Polypropylene (PP)	0,00
Polystyrene (PS)	0,00
Polyurethane (PU)	0,00
Polyvinyl chloride (PVC)	0,00
Silicon	0,00
Stainless steel (Cr, other alloys negligible)	125,00
Stainless steel (Cr/Ni, other alloys negligible)	0,00
Steel	0,00
Wood	0,00
Remaining materials (considered as steel according to TM65)	0,00

HKI Industrieverband | Haus-, Heiz- und Küchentechnik e.V.
Amelia-Mary-Earhart-Strasse 12 | 60549 Frankfurt am Main

Example for a report (Mid-level)

Report on the embodied carbon according to the TM65 method from CIBSE
"Mid-level" calcuation method

Results for the Embodied Carbon according to the TM65 calculation method from CIBSE

Embodied Carbon according to the TM65 calculation method from CIBSE (kg CO2e)	1405,95

Embodied Carbon Results Breakdown (kg CO2e)		Assumptions/Sources
A1: Material extraction	810,10	Material carbon coeffient based on TM65 Table 2.1 & IEC Database
A2: Transport	59,40	3000km by truck (TM65 Table 4.9)
A3: Manufacturing	54,40	Carbon factors for electricity based on TM65 Table 4.10
A4: Transport to Site	29,70	Transport scenarios in Europe based on TM65 Table 4.12
B1: Use	-	---
B3: Repair	98,32	10% materials replaced as part of repair (TM65 Chapter 4.2.2)
C1: Deconstruction	-	---
C2: Transport	1,98	100 km by truck (TM65 Table 4.7)
C3: Waste Processing	27,20	Carbon emissions associated with disassembly of the product based on TM65 Table 2
C4: Disposal	0,40	30% of product going to landfill (TM65 Table 4.14 and Table 4.15)

Embodied Carbon Results - without Refrigerant Leakage (kg CO2e)		Assumptions/Sources
A1-C4 (excluding B1, C1)	1081,50	No scale-up factor
A1-C4 with Buffer Factor (excluding B1, C1)	1405,95	1,3 as buffer factor (TM65 Chapter 4.2.2)

Embodied Carbon Results - Refrigerant Leakage only (kg CO2e)		Assumptions/Sources
B1: Refrigeration leakage during use	0,00	2% as refrigerant annual leakage rate (TM65 Table 4.4)
C1: Refrigerant leakage end of life	0,00	99% as refrigerant end of life recovery rate (TM65 Table 4.13)

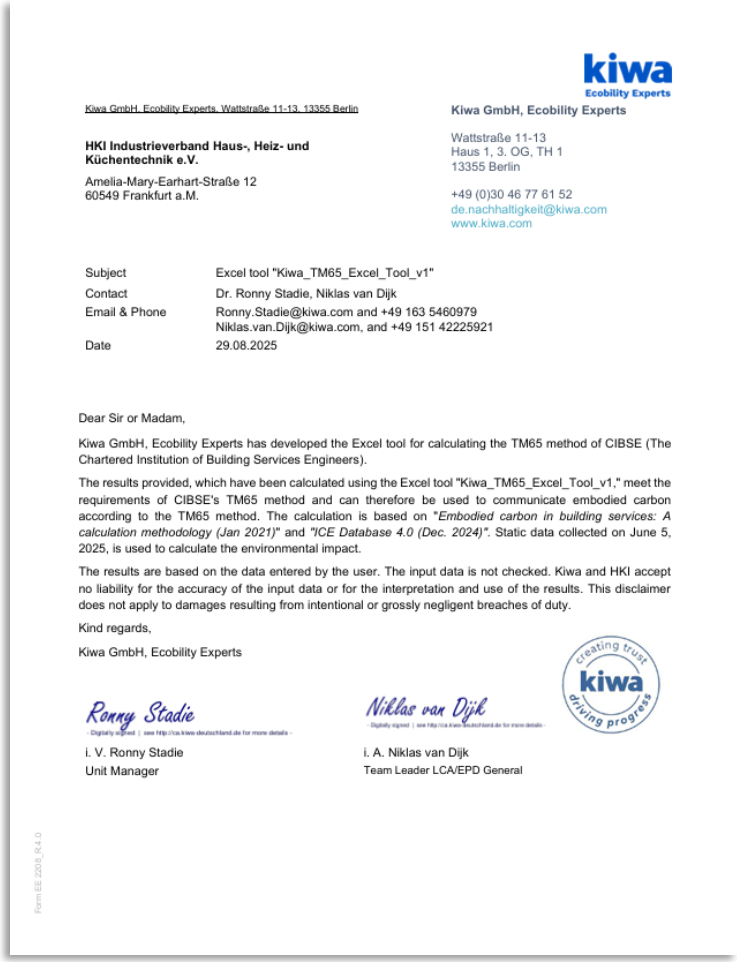
The results provided, comply with the requirements of the CIBSE TM65 method and can therfore be used to communicate the embodied carbon in accordance with the TM65 calculation method. The calculation is based on the document 'Embodied carbon in building services: A calculation methodology (Jan 2021)'. Material carbon coeffient based on TM65 Table 2.1 (Jan. 2021) & ICE Database 4.0 (Dec. 2024)

The results are based on the data entered by the user. The input data is not checked. Kiwa and HKI accept no liability for the accuracy of the input data or for the interpretation and use of the results. This disclaimer does not apply to damage resulting from intentional or grossly negligent breaches of duty.

HKI Industrieverband | Haus-, Heiz- und Küchentechnik e.V.
Amelia-Mary-Earhart-Strasse 12 | 60549 Frankfurt am Main

Confirmation from Kiwa

- Confirmation from Kiwa Ecobility Experts
  - The results provided, which are calculated using the Excel tool, comply with the TM65 methodology
  - Results can be used to communicate the „Embodied Carbon“ according to TM65 (CISBE)
- Important note:
  - The input data is not checked
  - Kiwa and HKI accept no liability for the accuracy of the input data or for the interpretation and use of the results



kiwa
Ecobility Experts

Kiwa GmbH, Ecobility Experts, Wattstraße 11-13, 13355 Berlin

HKI Industrieverband Haus-, Heiz- und Küchentechnik e.V.
Amelia-Mary-Earhart-Straße 12
60549 Frankfurt a.M.

Kiwa GmbH, Ecobility Experts
Wattstraße 11-13
Haus 1, 3. OG, TH 1
13355 Berlin
+49 (0)30 46 77 61 52
de.nachhaltigkeit@kiwa.com
www.kiwa.com

Subject	Excel tool "Kiwa_TM65_Excel_Tool_v1"
Contact	Dr. Ronny Stadie, Niklas van Dijk
Email & Phone	Ronny.Stadie@kiwa.com and +49 163 5460979 Niklas.van.Dijk@kiwa.com, and +49 151 42225921
Date	29.08.2025

Dear Sir or Madam,

Kiwa GmbH, Ecobility Experts has developed the Excel tool for calculating the TM65 method of CIBSE (The Chartered Institution of Building Services Engineers).

The results provided, which have been calculated using the Excel tool "Kiwa_TM65_Excel_Tool_v1," meet the requirements of CIBSE's TM65 method and can therefore be used to communicate embodied carbon according to the TM65 method. The calculation is based on "*Embodied carbon in building services: A calculation methodology (Jan 2021)*" and "*ICE Database 4.0 (Dec. 2024)*". Static data collected on June 5, 2025, is used to calculate the environmental impact.

The results are based on the data entered by the user. The input data is not checked. Kiwa and HKI accept no liability for the accuracy of the input data or for the interpretation and use of the results. This disclaimer does not apply to damages resulting from intentional or grossly negligent breaches of duty.

Kind regards,

Kiwa GmbH, Ecobility Experts

creating trust kiwa driving progress

Ronny Stadie
- Digitally signed | see http://ca.kiwa-deutschland.de for more details -

i. V. Ronny Stadie
Unit Manager

Niklas van Dijk
- Digitally signed | see http://ca.kiwa-deutschland.de for more details -

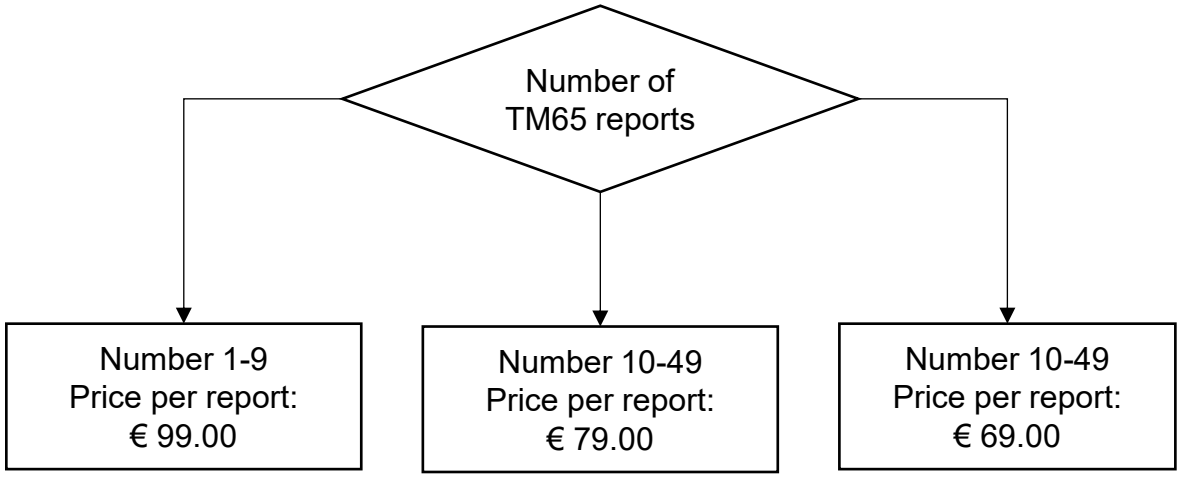
i. A. Niklas van Dijk
Team Leader LCA/EPD General

Form EE 2205_R4.0

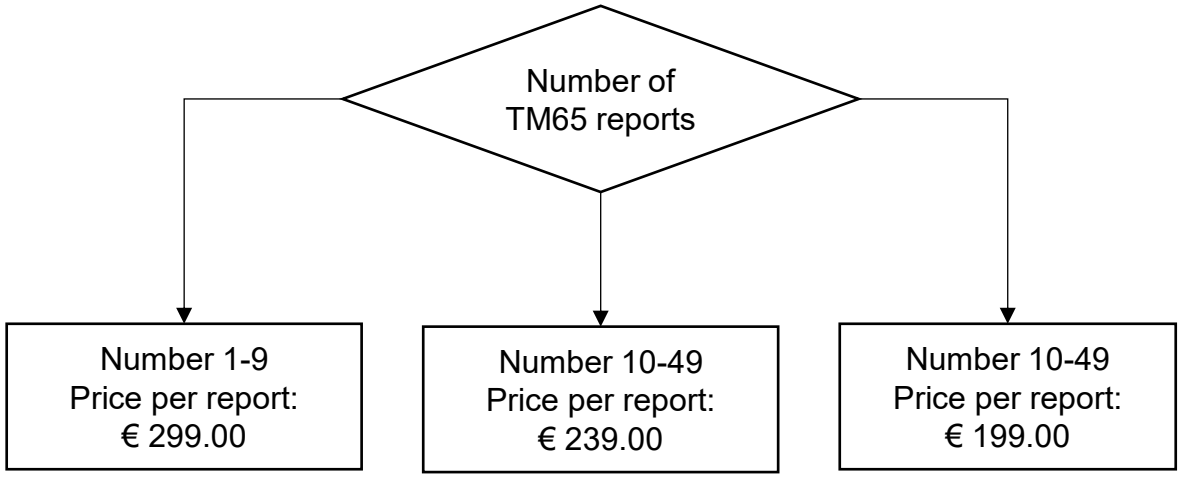
Costs for the service

- HKI members can use the service at a reduced rate

Prices for HKI members



Prices for non-HKI members



Representing the interests of industries since 1949

Industrial Association for House, Heating and Kitchen Technology

Fabian Anzmann
Amelia-Mary-Earhart-Straße 12
D-60549 Frankfurt a.M.
☎ +49 (0) 173 369 1475
✉ anzmann@hki-online.de