

KlimaLink Standard

Calculation of hotel emissions

Version 1.0

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Berlin, July 2026

Foreword

KlimaLink has set itself the aim of providing the tourism industry with a platform that makes the CO₂ emissions of various travel components available in one central location.

The demand for a standardised method of calculating climate emissions has grown significantly within the industry, and both business travellers and holidaymakers are increasingly asking for the actual emissions generated by their trips.

Various methods for calculating greenhouse gas emissions in tourism already exist. However, these do not define CO₂ emissions in a standardised manner and determine emissions using different approaches and levels of accuracy.

KlimaLink's aim is to make CO₂e emissions available to all users in the tourism sector in accordance with the following criteria, within a standard comprising various methods:

- CO₂e emissions are recorded systematically and with a high degree of accuracy.
- The CO₂ emissions from different travel components (flights, hotel stays, rail journeys, etc.) can be compared and categorised.
- The calculations are accurate enough to show travellers options for reducing greenhouse gas emissions even before they book.
- The calculations are accurate enough to enable comparisons of various types of combined travel products based on their absolute CO₂e emissions.
- The various methods rely entirely on travel input data that is available as standard within the travel industry's systems at tour operators and travel agents.
- The standard provides a unique CO₂e value for every travel component entered worldwide (flights, train journeys, hire cars, hotel stays, etc.). To this end, the individual methods specify fallback hierarchies which, in descending tiers (method variants), require increasingly less specific input data in order to always deliver the best possible result under the given circumstances.

What sets the KlimaLink standard apart is the ex-ante calculation of emissions per person. Data from previous years enables a concrete estimate of future emissions. This means that the emissions associated with travel – known as travel carbon footprints – are made visible even before a booking is made, thereby serving as a potential advisory and decision-making aid within sales channels for travel agents and customers.

The calculation methods underpinning the standard are dynamic and are updated whenever new scientific findings or improved data availability require adjustments.

Those in the tourism sector can access these emission figures via the emissions data platform made freely available by KlimaLink for this purpose.

This standard for calculating hotel stays was developed in accordance with ISO 14067, which sets out the methodology for quantifying the greenhouse gas emissions of products, and is therefore consistent with current legal requirements, such as the EU Directive Empowering Consumers for the Green Transition (EmpCo). This directive, which forms part of the EU Green Deal, aims to help consumers make informed and sustainable purchasing decisions

and to specifically prevent greenwashing. Sustainability claims must be clear, objective, publicly accessible and verifiable. The EmpCo will come into force in the EU on 27 September 2026.

1. Calculation of hotel emissions

ISO 14067 requires an assessment of the relevant life cycle of a product or service, taking into account the greenhouse gases emitted and, where applicable, those removed from the atmosphere, as well as the potential environmental impact of the product or service. In the Hotel-KlimaLink standard, a hotel overnight stay is defined as a service, and the key greenhouse gas-related processes within the specified system boundaries are taken into account. The calculation is therefore based on a clearly defined functional unit: the hotel overnight stay per person per night.

For the purpose of presenting the CO₂e-emission values of a hotel overnight stay as intended here, the calculation parameters are limited to the greenhouse gases emitted in connection with the overnight stay. Other environmental impacts, such as those arising from the manufacture of hotel furniture or other infrastructure, are not yet part of the KlimaLink calculation standard at this stage.

When calculating hotel emissions, KlimaLink uses a hybrid method combining the HCMI standard from the Sustainable Hospitality Alliance and the VDR standard. This is necessary because the methods are designed to complement one another and have different strengths and weaknesses. The HCMI standard, with its bottom-up approach, provides greater accuracy but requires third-party data verification and is currently unable to provide data for all regions of the world. The VDR method can fill these gaps where necessary, is applicable worldwide and does not require external verification. However, as a top-down approach, it is far less accurate. The KlimaLink hotel method therefore combines the HCMI and VDR methods in a hybrid process. Where data from the HCMI is lacking, the VDR calculation is used.

The aim of the calculation is to derive an ex-ante value per person per overnight stay. To ensure that the emission figures are comparable and transparent, uniform calculation rules, data sources and allocation principles are applied to all hotels. The three-tier methodology (Tier 1 to Tier 3) ensures consistent application of the calculation even where data availability varies. A combination of hotel-specific activity data and official emission factors ensures that the data and methods used are suitable and appropriate for assessing hotel stays. Furthermore, the future inclusion of further relevant Scope 3 emissions, in particular those from catering, is expressly provided for.

1.1. HCMI

The Hotel Carbon Measurement Initiative (HCMI) was developed in 2011 and 2012 by the Sustainable Hospitality Alliance (SHA) and the World Travel & Tourism Council (WTTC) in collaboration with 23 major international hotel chains and the business consultancy firm KPMG.

Since then, the methodology has been tested in practice by a large number of hotels and further refined on this basis.

The HCMI methodology is used by over 30,000 hotels worldwide. Given the high and steadily rising number of users, it is likely that the HCMI will become increasingly important internationally as a specific carbon footprint standard.

1.1.1. Description of the HCMI methodology

The methodology provides a CO₂e-footprint for hotels per (occupied) room per day. It covers the hotel's total on-site energy consumption as well as emissions from refrigerant leaks (Scopes 1 and 2 of the GHG Protocol) and also includes CO₂e emissions from laundry operations if the laundry is not processed on-site, as this area accounts for a significant proportion of emissions (Scope 3 emissions). The method also incorporates the use of renewable electricity and energy sources into the calculation of CO₂e footprints. Various data are collected for the calculation, as shown in the following table.

Constant data:

- Total area of guest rooms and corridors in m²
- Total area of event spaces in m²
- Total area of air-conditioned premises
- Number of rooms
- Total area of premises for private use, including staff accommodation (if any)

Data for each reporting year:

- Total number of occupied rooms in the reporting year
- Energy consumption for the reporting year: detailed breakdown of individual energy sources, e.g. fuel, electricity, district heating/cooling, etc.
- Emission factors (from official international or national datasets)
- Renewable energy (purchased, generated on-site)
- Electricity from renewable sources

Additional data

Depending on the facilities or processes at the respective hotel, the following data may also be provided:

- Energy consumption from external laundry services
- Emissions resulting from coolant leaks
- Fuel consumption from transport services such as shuttle buses or vehicles used on the hotel premises

A detailed description of the system boundaries applied can be found in Chapter 3, 'Boundaries', of the HCMI method. The method therefore complies with the requirements of ISO 14067 within the system boundaries described here and can be used to calculate the CO₂e-emissions value for a hotel stay.

Detailed information on the calculation method and the data required can be found via the following link:

<https://sustainablehospitalityalliance.org/resource/hotel-carbon-measurement-initiative/>

1.2. Data availability & calculation factors:

Of the more than 30,000 hotels that use the HCMI methodology to calculate their CO₂ emissions, approximately 15,000 report their actual emissions data annually to the *Cornell Hotel Sustainability Benchmarking Index* (CHSB). CHSB carries out a plausibility check and makes the aggregated data available as a publicly accessible dataset. Consequently, whilst the actual emissions data for individual reporting hotels is not available, the aggregated data is segmented by geographical location (based on countries, regions and, in some cases, cities) as well as by hotel class or star rating.

1.3. The VDR standard for hotel overnight stays

Unlike the HCMI, the VDR standard does not take a bottom-up approach based on individual hotels and their specific physical measurement data but instead adopts a top-down approach to hotel emissions. It is based on empirical studies that have measured CO₂e emissions from hotels in various countries, and which allocate a hotel's total CO₂e emissions, based on floor area, across the number of rooms and the various room categories. Total emissions are calculated from the hotel's Scope 1 and 2 emissions, which increase with the star rating.

In the VDR top-down approach, total emissions are derived from the destination's energy mix and the hotel's star rating. These are then allocated to the individual room categories, the average floor area of which also increases with the star rating. The necessary data is available independently worldwide and can also be applied, as an approximation, to hotels and countries where no bottom-up data from hotels is available.

1.3.1. VDR hotel class

Hotels are classified according to their facilities by being awarded stars, with several classification systems in existence (e.g. Michelin, DEHOGA). The key parameters for star classification, such as room size and comfort, generally affect energy consumption per overnight stay. Consequently, the number of stars awarded indirectly reflects these factors, with a higher number of stars being associated with higher resource consumption.¹

1.3.2. VDR Destination

Hotels with comparable facilities may, depending on the country, exhibit varying levels of energy and water consumption, as well as waste and wastewater generation. For example, climatic conditions have a direct impact on heating and hot water requirements. The implementation of energy efficiency and waste management systems may depend on the political framework. Furthermore, both occupancy rates and the CO₂ emission factors of energy sources vary from country to country. Therefore, the destination country directly or indirectly reflects these factors.

¹ The CHSB uses a global dataset of star ratings for hotels. This dataset is compiled on the basis of Expedia.

1.3.3. VDR booking class

The booking class – that is, the room category, e.g. standard double room, junior suite or suite – also plays a role in the emissions generated, as key distinguishing features of the booking class include room size, room facilities (appliances, air conditioning, etc.) and additional services, all of which influence CO₂e emissions. Where the booking class is known, it should also be taken into account in the calculation.

This leads to the following observations regarding the VDR standard:

- The VDR standard is based on data from hotels in 22 countries, which can also be applied to other countries. It takes a generic approach; in other words, it does not take into account the specific data of any individual hotel.
- The VDR standard can always provide a differentiated CO₂e result for a hotel stay worldwide, in accordance with the requirements of the KlimaLink hotel methodology. Whilst this figure may differ significantly from the actual situation at an individual hotel, it is based on approximations of factors that can be objectively determined (star rating, national energy mix).
- Verification of the data is not necessary, as it is based on scientific studies and official national data on the energy mix (e.g. from the IEA). However, this data should be updated regularly.

2. Limitations

The currently available average data on hotel emissions from the calculations of the HCMI and VDR standards are of limited relevance to the present KlimaLink standard. Essentially, the following points should be noted.

- HCMI data is predominantly based on information from large hotel chains.
- HCMI data is predominantly based on hotels in the USA (approx. 60 per cent).
- Although CHSB carries out statistical validity tests on the data as part of the HCMI, it is unable to verify the data beyond this.²
- HCMI and VDR data relate mainly to Scopes 1 and 2 of the GHG Protocol. From scope 3, only external laundry services and refrigerant leaks are currently recorded.

Furthermore, from KlimaLink's perspective, the HCMI standard currently has the drawback that the results (CO₂e per guest per night) are reported in only three categories, with the absolute CO₂e emissions in the first two categories broken down as follows.

- kg CO₂e per room (average across all hotel rooms only).
- kg CO₂e per m² per hour (event spaces).
- kg CO₂e per m² per year (average for the entire hotel only).

This means that a guest who, for example, books a suite with three times the floor area of a guest in a standard room is nevertheless reported as having the same CO₂e footprint. This can lead to perverse incentives for tour operators who base their hotel procurement for trips

² However, over 70 per cent of the data has been verified through external audits as part of the companies' sustainability reporting.

on the low average figures but book the larger rooms for their guests. There also remains the question of what happens to the CO₂e emissions from event spaces, which are deducted from the figures for overnight guests in the HCMI. If this occurs at a time when the event spaces are fully booked by guests, then the CO₂e emissions must also be attributed to these guests. However, if, for example, the event spaces are unoccupied in certain months, only the tourist guests at the hotel contribute to the emissions. Consequently, they would also have to bear the CO₂e emissions from these event spaces.³

2.1. Catering flat rate

Catering, in particular, plays an important role when travelling^{4 5}. Taking into account the relevance and completeness criteria of the GHG Protocol, the aim should be to incorporate catering – and, in future, other Scope 3 emissions – into the calculation. Neither the HCMI nor the VDR standard currently takes hotel catering (e.g. breakfast, half-board or all-inclusive) into account. From the latest version of the HCMI method (Version 3.0) onwards, additional Scope 3 emissions are being collected, which can provide a suitable database.

The KlimaLink standard envisages implementing this in future in the form of flat rates per guest for different types of catering, thereby supplementing both methods with a catering flat rate.

3. KlimaLink Method: Interaction between VDR and HCMI

The previous descriptions show that, in practice to date, no standard has been able to accurately calculate the specific CO₂ emissions of an individual hotel. Deviations are unavoidable, for example, if a hotel has switched its energy supply entirely to renewable energy sources or implemented other efficiency measures, such as in the areas of thermal insulation, water supply and waste management.⁶

Linking the hotel-specific HCMI approach with the globally applicable VDR standard enables a coherent methodology for different regions and market segments. Within the KlimaLink framework, VDR and HCMI are therefore used in combination, in accordance with their respective strengths and weaknesses, as follows:

- **Tier 1:** A hotel reports in accordance with HCMI, including the additional data mentioned above (room sizes, number of guests, use of event spaces). The report is verified by an independent environmental auditor. The hotel's data is entered into the KlimaLink database and shows CO₂e emissions per guest per night across the hotel's various room categories.

³ For a more accurate application of the KlimaLink hotel method, it would therefore be necessary – in addition to the HCMI data – to record the size and frequency of bookable hotel rooms, as well as the total number of guests booked (tourists and events) and the space they have booked. From this data, multipliers can then be derived – analogous to aircraft seat classes – based on room size, which calculate the CO₂ emissions for each hotel room category without double-counting or undercounting.

⁴ Castellani, Valentina; Sala, Serenella. 2012. "Ecological Footprint and Life Cycle Assessment in the sustainability assessment of tourism activities." *Ecological Indicators*, 16: 135–147. doi: 10.1016/j.ecolind.2011.08.002

⁵ Federal Statistical Office. Tourism-related energy consumption, greenhouse gas emissions and raw material input – German Federal Statistical Office (destatis.de)

⁶ To avoid disadvantaging hotels that have invested in reducing CO₂e emissions, it is necessary for KlimaLink to establish the conditions in future that enable hoteliers to report verified CO₂e emissions individually.

- **Tier 2:** Average emissions data for hotels, depending on location and hotel category, are used on the basis of the CHSB dataset. If a specific hotel for which the KlimaLink user is seeking CO₂e emissions can be assigned to a group of CHSB datasets (by country, hotel category and location), then these CHSB data are fed into the VDR standard as input. This standard differentiates CO₂e emissions per average room and applies a 25 per cent uncertainty margin to the CO₂e emissions per guest per night for event spaces.
- **Tier 3:** If no CHSB data is available for the hotel in question, as in Tier 1 or 2, the VDR standard is used as a fallback. In addition, an uncertainty margin of 50 per cent is applied to the CO₂e emissions per guest per night.

The uncertainty margins in Levels 2 and 3 provide incentives for hoteliers to supply data in accordance with Level 1 or at least Level 2 under the HCMI, to have it verified by third parties, and to report it to KlimaLink.

The KlimaLink standard takes into account the requirements for avoiding double counting by clearly allocating emissions to the functional unit ‘overnight stay per person’. Furthermore, it is expressly stated that when allocating emissions to different room categories and event spaces, an allocation based on the source of the emissions is required in order to avoid over- or under-counting. Further development of the methodology provides for additional differentiations and allocation rules in this regard.

The KlimaLink Standard is explicitly designed as a dynamic system. New scientific findings, improved data sets and further developments of existing methods are regularly integrated into the standard. Furthermore, the tiered structure and the planned further developments regarding Scope 3 emissions enable continuous improvement of the methodology.

This document was produced as part of the ‘Climate-Conscious Travel’ project, in which all companies, associations and organisations in the tourism sector are invited to participate. The project is funded and implemented by Futouris e.V. Use of the KlimaLink emissions data platform is open to all tourism businesses.

In anticipation of the EU’s ‘Empowering Consumers Directive for the Green Transition’, KlimaLink has successfully had the calculation standard for overnight stays in hotels and holiday accommodation in 2026 verified by GUTCert⁷ – an accredited certification body in Berlin – to ensure compliance with ISO 14067. A copy of the certificate is included in the appendix.

Contact Futouris / KlimaLink

KlimaLink e.V.
c/o DRV
Lietzenburger Str. 99
10707 Berlin
info@klimalink.org

Swantje Lehnert
Managing Director of Futouris
Chair of the Board at KlimaLink
Swantje.lehnert@futouris.org

Project Manager

Prof. Dr Harald Zeiss
Institute for Sustainable Tourism Ltd
harald.zeiss@inatour.de

⁷ <https://www.gut-cert.de/en/home-en>

Resultat

In Rahmen eines vereinbarten Verfahrens wurden die folgenden Tools der Organisation

KlimaLink e.V.

am Standort Lietzenburger Straße 99, 10707 Berlin

validiert:

„KlimaLink Standard Hotel“

„KlimaLink Standard Ferienunterkunft“

Die beiden Übernachtungsstands „KlimaLink Standard Hotel“ und „KlimaLink Standard Ferienunterkunft“ erfüllen die Anforderungen der für den Berechnungszweck relevanten Normkapitel aus den Kapiteln 3, 5 und 6 der ISO 14067:2019-02.

Die Einzelheiten zum Umfang der Prüfung sind im Anhang dargelegt. Die Berechnungsstandards erfüllen alle relevanten Anforderungen gemäß den im Anhang aufgeführten Normkapiteln. Die für die Berechnung verwendeten Emissionsfaktoren basieren auf veröffentlichten Informationen oder anerkannten, glaubwürdigen Quellen. Die angewandte Berechnungsmethode wurde auf Eignung und Plausibilität überprüft.

Die für die Prüfung erforderlichen Informationen wurden in den Dokumenten „2027_07 Hotel KlimaLink Standard V1.0.pdf“ und „2027_07 Ferienunterkunft KlimaLink Standard V1.0.pdf“ vom 31.07.2026 klar dargelegt.

Die Prüfung wurde gemäß eines geeigneten Verfahrens entsprechend den Vorgaben der ISO 14064-3:2020-05 Anhang C durchgeführt.

Basis des Ergebnisses ist der Prüfbericht mit der Nr. C-26-25274-Tool.

Berlin, 26.08.2026



Prof. Dr.-Ing. Jan Uwe Lieback
Geschäftsführer

Nr. C-26-25274-Tool

Annex zu C-26-25274-Tool

Details zu Prüfungsinhalten

ISO 14067:2019-02 mit folgenden Kapiteln:

3.1.1, 3.1.2, 3.1.3.1, 3.1.6.1, 5.6, 6.3.4, 6.3.5, 6.3.6, 6.4.2, 6.4.3, 6.4.4, 6.4.5, 6.4.6.