

About Hotel Carbon Measurement Initiative (HCMI) Methodology introduction

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In support of *



Glasgow Declaration
Climate Action in Tourism

*Final validation in process

Supported by



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If you would like a copy of the full HCMI methodology to incorporate into your own system, please email info@sustainablehospitalityalliance.org.

Introduction

What is HCMI?

HCMI is a methodology, and accompanying excel tool, which was developed by the hospitality industry to calculate and communicate the carbon footprint of hotel stays and meetings in a consistent and transparent way.

The methodology covers all GHG emissions resulting from activities within their premises (known as scope 1 and 2 emissions) and, if applicable, from outsourced laundry operations (scope 3).

How was it created?

In June 2012, Sustainable Hospitality Alliance (the Alliance) and the World Travel & Tourism Council (WTTC), in collaboration with 23 leading global hospitality companies, launched the Hotel Carbon Measurement Initiative (HCMI) version 1.0.

It was tested in hotels of different styles and sizes in different geographical locations and further refined following subsequent stakeholder engagement including a number of hotel associations and a review by the World Resources Institute (WRI) – one of the GHG Protocol development partners. The methodology has subsequently been updated following further feedback from users and research by Cornell University's Center for Hospitality Research.

It was most recently updated in October 2022 to align more with the GHG Protocol guidance on reporting emissions from renewable energy sources.

Who should use this methodology?

The methodology is designed to be applied by any hotel around the world. The methodology has been designed in partnership with major hotel groups; however, it applies to individual hotels, large and small, regardless of the type of amenities offered.

There is a methodology, which can be incorporated into reporting platforms, and a stand-alone tool, which can be used by those hotels which don't have an environmental reporting system.

How does it align with other GHG reporting standards?

GHG Protocol

The HCMI methodology follows the GHG Protocol principles of relevance, completeness, consistency, transparency, and accuracy.

The GHG protocol has four reporting standards, none of which individually fit with the purposes of HCMI. The HCMI methodology is aligned to the GHG Protocol's *Corporate Standard* but it calculates emissions at the individual hotel level, not at the corporate level. The HCMI methodology is aligned to the GHG Protocol's *Product Life Cycle Standard* in so far as it calculates GHG emissions resulting from the running of a hotel, but it does not calculate the emissions of the full life cycle of the hotel such as its construction materials, fittings and amenities including raw materials, manufacturing, transportation, storage, use and disposal. The HCMI methodology incorporates the [GHG Protocol Scope 2 guidance](#) to enable hotels to report on their use of renewable energy and electricity, using the market-based accounting method to enable purchase of renewable energy via market mechanisms to be included. HCMI also offers a simplified method for hotels to aggregate and communicate on their use of renewable energy and electricity.

ISO14064

HCMI also follows the principles of ISO14064-1 and includes requirements for determining boundaries, quantifying emissions and removals, and reporting data at the individual hotel level. HCMI however does not require hotels to disclose specific activities aimed at improving GHG management or provide guidance on quality management of the GHG inventory. Currently, HCMI only recommends an internal review process and does not mandate external verification.

How does it support wider industry climate action?

In November 2021, at COP 26, The Glasgow Declaration on Climate Action in Tourism was launched to unite travel and tourism behind a common set of pathways for climate action, align the sector with global commitments and catalyse collaborative solutions to the many challenges facing businesses and destinations globally. The Glasgow Declaration encourages the acceleration of climate action in tourism by securing commitments to reduce emissions in tourism by at least 50% over the next decade and achieve Net Zero as soon as possible before 2050.

To ensure climate action is aligned across all of tourism, five shared pathways were agreed upon; measure, decarbonise, regenerate, collaborate and finance. As a founding partner of the Declaration, the Alliance is pleased to offer continued support to accommodation signatories, to calculate their carbon footprint and fulfil their reporting requirements, through this update of HCMI.

Who supports use of HCMI?

HCMI is supported by industry leading organisations, including the World Travel and Tourism Council (WTTC), Global Sustainable Tourism Council (GSTC), the American Hotel and Lodging Association (AHLA) and the Global Business Travel Association (GBTA).

What are the limitations of HCMI?

The methodology attempts to strike a balance between ease of implementation and accuracy. We recognise that the methodology has certain limitations, but it is designed to be applicable to all types of hotels around the world even those with no previous experience in carbon reporting. The methodology is not an assessment of all environmental risks and opportunities that hotels face and is only a first step in the implementation of a thorough environmental programme. The methodology is a voluntary approach to measure GHG emissions. A number of other organisations provide guidance on activities such as carbon neutrality, product life cycle assessment, or energy management, which are not within the scope of this methodology.

Metrics

What metrics does the methodology calculate?

The methodology provides hotels with a carbon footprint:

- Per area of the total building on an annual basis;
- per occupied room on a daily basis, and;
- per area of meeting space on an hourly basis.

How is use of renewable energy expressed?

The HCMI spreadsheet allows hotels to aggregate and report on their use of these renewable electricity and energy sources, expressing the results in the following format:

- TOTAL renewable energy and electricity used by the hotel (kWh)
- TOTAL renewable electricity used by the hotel (% of total electricity use)
- TOTAL renewable energy and electricity used by the hotel (% of total energy consumption)

How can metrics be used?

Track performance

Metrics can be compared on an annual basis to understand the impact of efforts to decarbonise.

Share with customers

Metrics can be used to calculate the carbon footprint of a specific client's use of the hotel (i.e. number of room nights and usage of meeting rooms). These are the measures which feedback

has suggested the industry will find most useful, particularly for hotels completing **Request For Proposals (RFPs)** from potential clients.

Benchmark your property

HCMI metrics can be compared against data in the [Cornell Hotel Sustainability Benchmark Index](#) (CHSB) – the hotel industry’s largest annual benchmarking of energy, water, and carbon. HCMI methodology is also used by the [Hotel Footprinting](#) benchmarking tool.

Boundaries

What is included in the boundaries?

The methodology requires hotels to report on all **Scope 1 and 2 GHG emissions** resulting from activities within their premises including restaurants, meeting spaces, shops, casinos, golf courses, spas, garden space, fitness centres, ‘*back of house*’, and any other amenities that are located within the hotel’s premises.

Outsourced laundry operations (scope 3) are included in a hotel’s overall footprint in order to assist with the comparability of different hotels’ overall footprints.

Although for many hotels, **fugitive refrigerant emissions** will be insignificant compared with their total GHG emissions, they can have a significant impact as they are much more damaging to the atmosphere than CO₂¹. Refrigerant replacement may be a significant source of emissions for hotels with significant air-conditioning or refrigeration systems, due to leaks (over 100kg) or major maintenance programme during the reporting year, and so should be measured and included (using the HCMI excel spreadsheet or guidance in section 5.3 in the methodology).

If a hotel uses **fuels for owned or operated vehicles** (e.g. hotel shuttles, company cars, landscaping equipment, jet skis etc.), this should be measured over a 12 month period and converted to CO₂. If this is 5% or more of the total footprint then it should be included in reporting. If not, it can be excluded but relative consumption should be reviewed annually to check if it needs to be included.

What is excluded from the boundaries?

Private space which is not accessible to hotel guests or conference attendees (e.g. private apartments) or not related to the hotel (e.g. the hotel leases a floor to a third party, such as restaurants, shops, hairdressers, etc.) should be excluded from the calculations. On-site staff accommodation is also considered private space.

Other ‘scope 3 emissions’ (referred to in the GHG Protocol) coming from activities such as travel (guests’ travel to and from the hotel and employees’ business travel), production of purchased materials and consumables in the hotel, waste disposal, product use, and other outsourced activities (except laundry) are excluded.

If a hotel generates energy and sells or provides a portion of it to another party or sells any back to the grid, this portion should not be included.

Reporting period

What time period should my data cover?

Calculations must be performed once a year and use a 12-month data set (reporting period). The 12-month data period can be defined by each hotel or company e.g. calendar year, financial year.

¹ the **Global Warming Potential** (GWP) of different refrigerants varies greatly. Some commonly used refrigerants (R-22, R-134A, R404, and R410-A) are particularly harmful. For example, the R-22 gas traps 1,810 times more heat in the atmosphere than CO₂.

When should my metrics be calculated?

From the end of the reporting period, hotels have six months to gather data and calculate the footprint. Carbon footprint data is valid for 12 months after calculations are done (the disclosure period). Therefore, footprint data is never more than 18 months old during normal operations.

Renewable energy purchases must be attributed to the same 12 month period, without forward or retroactive allocation.

Please note that preparing the data in 60 days instead of 6 months is considered 'best practice'.

What happens if I am a new property or my operations are interrupted?

The methodology calculates GHG emissions during "normal operations". Initial operations for new builds in the first months prior to stabilized occupancy, or interruptions to operations due to refurbishments or other factors (pandemic, geopolitical unrest, etc.) during the reporting year may distort results which aim to show a normal operating position.

If abnormal circumstances alters the energy consumption by +/- 20% compared to a standard reporting period then hotels must use the most recent period of data that reflects close to normal operations (and disclose this fact alongside impacted HCMI metrics when communicating externally). Although the data will be outside of the standard period in section 4.2, it is more likely to be a truer reflection of the hotel energy consumption during normal operations.

What if my property is very seasonal?

We recognise that hotels energy consumption vary by seasons. However, in line with the GHG Protocol, variations during the year are not taken into consideration. Hotels are asked to provide one GHG emissions figure per year with emissions averaged out over the 12-month period.

Data requirements

What basic information do I need to know about my hotel?

You will need to know some basic information about your hotel to perform the calculations. This data is unlikely to change year on year and should be readily available to hotel managers.

Data requirements	Rationale	Likely source
Reporting year (start and end date)	Necessary to provide the disclosure period 12 months period should be used	Determined by the hotel's management team
Total area of guest rooms and corridors (sqft or sqm)	Necessary for footprint apportionment	Architectural plan, property/facility management
Total area of meeting facility space (sqft or sqm)	Necessary for footprint apportionment	Architectural plan, property/facility management

If the hotel has any **private space** you may also need to know:

Private space (sqft or sqm)	Necessary for footprint apportionment	Architectural plans, property/facility management
Total area of conditioned space (sqft or sqm)	Necessary for footprint apportionment if private space isn't sub-metered.	Architectural plan, property/facility management

What data do I need to gather each year?

You will need to gather the following data for the reporting period each year:

Data requirements	Rationale	Likely source	Further guidance
Total number of occupied rooms for reporting year	Necessary for footprint apportionment (and for outsourced laundry estimations, if needed).	Sales data or management accounts data	No-shows are not included in occupied room count, but complimentary rooms that were occupied but not paid for are included.
Total energy consumption for the reporting year from all fuels and electricity etc.	Necessary for total footprint calculation	Energy bills and/or meter readings	<p>It should include all Scope 1 and 2 fuels, including but not limited to:</p> <ul style="list-style-type: none"> • Fuels consumed on-site such as natural gas (stationary combustion), oil and other fuels • Purchased electricity • Mobile fuels burned (from vehicles and landscaping equipment) • District heating, district cooling or energy purchased from a Combined Heat & Power (CHP) plant not operated by the hotel <p>Consumption data based on actual meter readings is preferable as energy bills can be inaccurate or based on estimated readings. It is good practice to take your own meter readings to measure your energy consumption and verify the accuracy of your energy bills. Meter readings should be scheduled to coincide with carbon monitoring and reporting periods. Meter readings should be taken at regular intervals and a process should be in place to record the readings.</p> <p>Smart meters that record consumption on a half-hourly basis are effective tools to measure and manage your energy consumption.</p>
Emission factors	Necessary for total footprint calculation	<p>Emission factors are obtained from national or international Datasets (e.g. IEA, AIB).</p> <p>Emission factors should correspond to the latest available publication within the same 12 month period of the data set.</p>	<p>These should be country or state specific to allow for greater accuracy. Each type of energy consumption (e.g. gas, oil, electricity, should have its own emission factor). Hotels may use either the location-based accounting approach or the market-based accounting approach, but should use market-based emissions approach if they are purchasing renewable electricity so that the purchases can be counted. Note that the HCMI Calculation Tool uses market-based emissions and the AIB emission factors for residual mix for EU countries by default.</p> <p>Where hotels are required to report emissions by local legislation and regulation, they should align the choice of emission factors for HCMI with that reporting.</p> <p>EFs should include emissions of carbon dioxide, methane and nitrous oxide from all the agreed sources (i.e. hotels should use CO₂-equivalent EF that incorporate the Global Warming Potentials of CH₄ and N₂O, instead of CO₂ EF).</p>
Renewable electricity	Necessary for total footprint calculation	<p>Renewable energy certificates</p> <p>Power Purchase agreements</p>	For electricity purchased from a supplier generating electricity from renewable sources, the amount of renewable electricity supplied should be verifiable through mechanisms such as Power-Purchase Agreements, and Renewable Energy Certificates. Certificates of origin are recommended as the most robust source of

	and renewable energy metrics	Energy bills Electricity generator meter readings	data. In case certificates are not available to indicate the specific amount of kWh of renewables or the % of the property's load, please refer to the energy mix or share of renewables as part of the contract that is above the standard grid mix as disclosed on energy bills or contracts, and allocate the incremental difference in percentage proportionate to the amount of electricity covered. Renewable electricity can also be produced on-site by the hotel using solar panels or wind turbines, or any renewable electricity generation system.
Other renewable energy	Necessary for total footprint calculation and renewable energy metrics	Energy bills, or energy generator meter readings	This includes energy and heat purchased from a supplier using renewable sources (e.g. geothermal district heating), or generated on-site using renewable sources (such as biomass, biofuel, hydropower, geothermal energy, solar)
Outsourced laundry	Although this is Scope 3, it is necessary for total footprint calculation to enable comparability between hotels	Laundry contractor or estimations (see further guidance for info)	In order of preference, the data for inclusion is: 1. Energy consumption provided by your laundry contractor and added to your total energy consumption. The laundry supplier probably washes and dries laundry for several clients. Therefore its total energy consumption should be apportioned to a specific hotel based on the percentage of volume that each hotel is responsible for. If this is not available, a percentage of revenue may be an appropriate application. You can do this using the HCMI excel spreadsheet or estimation technique 2 in the methodology. 2. Tonnage of laundry for the year used to estimate the energy consumption (using the HCMI excel spreadsheet or estimation technique 2 in the methodology). 3. Number of occupied rooms for the year used to estimate the energy consumption (using the HCMI excel spreadsheet or estimation technique 3 in the methodology).
Refrigerants	Necessary for total footprint calculation	Purchase data or estimations	The amount of refrigerants used is quantified by measuring the amount of refrigerant gas being replaced in each cooling unit. This information should be available from your Maintenance team or from contractors hired to service your equipment. The data may be obtained from service logs and purchase or usage records.

What if I don't have a full 12 months of data?

If you do not have data for the entire year, you may estimate your consumption based on the following estimation techniques².

- Pro rata: calculating the daily energy consumption using the available data, and multiplying the daily energy consumption by the number of missing days.
- Direct comparison: using consumption data for a similar period in the previous year. The advantage of this is that it accommodates variability in energy demand (e.g. gas consumption in winter and summer months).
- Price settlement: calculating energy consumption by dividing your energy costs by your energy rate.

Emissions

Can I account for offsets I purchase?

The methodology measures the GHG efficiency at which a hotel provides guest rooms and meeting space to its customers. If the hotel purchases carbon offsets, it can disclose this information, but it cannot deduct the amount of emissions that is offset from its total GHG emissions. This is consistent with GHG Protocol Corporate Standard Revised version 2004 (chapter 11 page 82); "companies should always report their own internal emissions in separate accounts from offsets used to meet the target, rather than providing a net figure."

Why are emissions apportioned between guestrooms and meeting space?

For carbon reporting purposes, the hotel is divided into its two main services, guestrooms and meeting space, to avoid overlapping of footprints for guests that both attend meetings and stay at the hotel. GHG emissions are allocated to guest rooms and meeting space based on the ratio of space occupied by guest rooms and meeting space within the hotel.

Why is the carbon intensity apportioned equally based on floor area?

The methodology assumes equal intensity for all areas of the hotel. This was deemed necessary to keep the methodology simple enough that hotel managers can use it on their own, without the need of extensive sub-metering, data analysis, or external assistance.

Review

Is any internal or external review required when using HCMI?

While there is no requirement for external review, we recommend the following activities are implemented, in line with GHG Protocol guidance, in order to reduce the risk of errors:

- Conduct an independent review: at the minimum, ask someone who has not been involved with the calculations to check the data; an external review will add to the credibility of the data
- Check for mistakes in converting measurement units, entering data, using formulas, etc.
- Check for large variances in energy consumption between periods: can these be explained or could there be an error between invoices or meter readings and your calculations spreadsheet?

Where appropriate, compare results of different hotels within a group and investigate unexplained differences to identify and address different applications of the methodology.

² UK Government: <https://www.gov.uk/government/collections/energy-and-emissions-projections>

Future enhancements

Will HCMI continue to be enhanced and, if so, how?

While version 2.0 of the methodology has been released to address the critical aspect of allowing market-based purchases of renewable energy such as Renewable Electricity Certificates (RECs) to be incorporated into the final HCMI metrics, it comes a time when the focus and pressures on businesses to calculate their full value chain emissions are increasing, as are the further needs for standardisation and harmonisation of carbon calculations. In late 2022, the Sustainable Hospitality Alliance is embarking on a subsequent revision to the HCMI methodology, in order to release the version 3.0 in 2023. This version will address the parked issues currently identified, including but not limited to:

- Addressing the industry gap of a common standard or guideline for defining the conditioned space of a hotel that is globally applicable and used in practice
- Further resources and coefficients for estimating energy usage from outsourced laundry based on a hotel's location and type
- Additional configurations of hotels within buildings, as well as amenities or other services within hotels but separate from their direct operations for the provision of the room night, which will impact the allocation of emissions
- Defining boundaries, quantification, and metrics to encompass additional Scope 3 value chain emissions of a hotel
- Arriving at a common industry definition of a carbon neutral stay or carbon neutral meeting with corresponding methodology
- Enabling further consistency in calculation for more accurate comparability among hotels