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Hotel Sustainability Benchmarking Index 2025:

Carbon, Energy, Water, and Waste

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QUICK TAKE

CHSB2025 continues the annual benchmarking initiative carried out through a partnership between the Cornell University Center for Hospitality Research, participating hotels, Greenview, and an industry advisory group. CHSB2025 reinforces its role as the industry's most robust and transparent benchmark for energy, water, and carbon performance in the hospitality sector.

This report documents the methodology used to compile and standardize environmental performance data from hotel properties worldwide for the 2023 calendar year. The 2023 dataset saw a 16.0-percent increase in the number of hotels participating. There was a 34.1-percent increase in valid output, with 27,219 hotels contributing to the final global dataset.

To enhance data completeness, CHSB2025 marks the first attempt to analyze and disclose a new waste index, which introduces benchmarks for seven waste metrics. However, with a relatively limited data pool of 9,800 waste submissions, only about 4,500 records passed validation and were usable for benchmarking purposes.

INTRODUCTION

The purpose of this report is to serve as a technical reference for stakeholders seeking to understand the structure, methodology, and underlying data model of the CHSB benchmarking framework. The dataset remains freely available for download from the Cornell University Center for Hospitality Research.

The report includes the following:

- Methodology for data collection and validation,
- Emission factor application protocols,
- Segmentation logic for property classification,
- Definitions of benchmarking indicators for carbon, energy, and water performance, and Criteria for dataset inclusion and exclusion.

OVERVIEW

The dataset provides benchmark ranges for fourteen distinct measures related to energy, water, and carbon emissions across 1,307 geographies, defined by market area, country, climate zone, and other geographic or political boundaries. Additionally, the data are segmented by various hotel attributes, including asset class, location type, service level, market segment, and star classification.

This comprehensive segmentation ensures that the benchmarking data are both detailed and relevant for a wide range of stakeholders in the hospitality industry. The 2023 dataset includes the following improvements over the previous cycle:

- Added the new waste index, which includes benchmarks for seven waste metrics across 27 countries, as well as 133 market areas in the United States.
- Increased the number of geographies from 1,072 to 1,307 across market areas, regions, countries, and climate zones (21.9% increase).
- Increased the number of hotels with valid outputs to 27,219 (34.1% increase).
- Increased the number of hotels participating to 31,872 (16.0% increase).
- Increased the room count coverage of the output dataset to 4,367,966 rooms (20.2% increase).
- Increased the floor area coverage of the output dataset to 393,220,512 square meters (28.1% increase).

The increase in data output enriches the quality of the dataset, which can be used for further research and decision-making purposes.

SUMMARY OF CHANGES

The CHSB2025 cycle introduces a series of updates to both the benchmarking dataset and underlying methodology. These changes reflect continued efforts to improve data quality, increase analytical precision, and ensure alignment with industry reporting standards.

Key updates include:

- The new waste benchmarking dataset includes benchmarks for seven waste metrics.
- The added separate Hotel Food Waste Report that looks into food waste practices, disclosure, and reduction efforts across the hospitality industry.
- The redefined Measure 13 looks specifically at the percentage of electricity generated from both onsite and offsite renewable sources for each hotel, excluding the renewable mix of electric power grids.
- The new Measure 14 benchmarks the property's ratio of electric to non-electric energy.
- Additional validation parameters are embedded to identify inaccurate duplicates in months of utility data during validity testing.
- Enhanced Hotel Benchmark Reports present benchmarks at more geographic levels and multiple levels of granularity.
- Updated location-based and market-based emission factor sources are included for seven countries across energy types, affecting the calculations for Measures 1, 2, 3, 4, and 7 (refer to the CHSB2025 Guidance on Emission Factors document for more details on the emission factors used).
- Market-based emission factor sources are included for two countries for two energy types (electricity and purchased chilled water), affecting the calculations for Measures 1, 2, 3, 4, and 7. (Please visit the CHSB2025 Guidance on Emission Factors document for more details on the emission factors used).

METHODOLOGY

This section outlines the technical approach used to collect, standardize, verify, and analyze hotel sustainability data.

Data Collection

Forty-five hotel companies representing 31,872 hotels submitted data for the benchmarking cycle (see Exhibit 1). Specific data points collected from each member are listed in Appendix 1. Additional details on the inclusion and exclusion boundaries for water, energy, and waste types are provided in Appendix 2, Appendix 3, and Appendix 4.

The data submission window extended from April to August 2024, covering the full calendar year of 2023. The channels for data collection include:

- CHSB data collection form,
- Members' data management platforms,
- Members' greenhouse gas inventories, and
- Greenview Portal.

About 20 percent of the members, covering approximately 71 percent of hotels in the dataset, had externally assured their data to be in accordance with ISO 14064. Besides confirming the presence of onsite laundry for main linen washes for Measure 1, Measure 7, Measure 10, and Measure 11, no additional information was collected on the range of amenities that could contribute towards hotels' utility use.

Data Harmonization

This step ensures that data received from diverse sources are standardized into consistent units and formats, allowing for accurate aggregation and comparison. Harmonization accounts for regional differences, utility types, and reporting variations to ensure uniformity across all data entries.

Conversion Factors (CFs)

To ensure comparability, all submitted data were converted into common units:

- Energy: kilowatt-hours (kWh)
- Water: liters (L)
- Waste: kilograms (kg)
- Floor area: square meters (m^2)
- GHG emissions (also termed carbon footprint) in kilograms of carbon dioxide equivalent ($kgCO_{2e}$), calculated by converting each energy source of GHG emissions into $kgCO_{2e}$ (using only carbon dioxide, methane, and nitrous oxide).

For the CHSB index tool, it is assumed that no coefficient of performance (COP) is applied to the chilled water

EXHIBIT 1

Participating organizations

Accor	Millenium Hotels and Resorts
Casale Panayiotis	Nobu Hotel London Shoreditch
Centara Hotels & Resorts	Pan Pacific Hotel Group
Chatham Lodging Trust	Park Hotel Group
CitizenM	Park Hotels & Resorts
DiamondRock Hospitality Company	Pebblebrook Hotel Trust
Eaton HK	Pineapple Hospitality Company
Four Seasons	Playa Hotels & Resorts
Fullerton Hotels	Post Ranch Inn
Grand Central Hotels	Pro-Invest
Grosvenor House Suites	Radisson Hotel Group
Hilton Worldwide	RLJ Lodging Trust
Hongkong & Shanghai Hotels	Rosewood Hotels & Resorts
Horwath HTL Asia Pacific	Ryman Hospitality Properties
HPL Hotels & Resorts	Six Senses
Hyatt Hotels Corporation	Sutton Hotel Collection
InterContinental Hotels Group	The Ascott Limited
KHP Capital Partners	The Ranch at Laguna Beach
LDC Hotels & Resorts	The RuMa Hotel and Residences
Loews Hotels	TUI Hotels & Resorts
Mandarin Oriental Hotel Group	Vista Hospitality Group
Marriott International	Xenia Hotels & Resorts

consumption data submitted in energy units (e.g., ton-hours, kWh, kBtu, MJ, etc.). However, in the bespoke hotel benchmark report received by each participating hotel, a COP of 4.0 is uniformly applied to chilled water consumption data. Also, minor energy sources such as space heaters and emergency generators are commonly not provided by participating members and not included due to being insignificant sources.

For waste data submitted in volume, they were converted into kilograms using the USEPA Volume-to-Weight Conversion Factors for Solid Waste. For more details on the conversion factors applied, please contact us at data@greenview.sg.

Emission Factors (EFs)
The set of emission factors (EFs) applied to each energy type was based on available data for each geography. The list of references for all EFs used to quantify greenhouse gas emissions is outlined in the CHSB2025 Guidance on Emissions Factors document, available via the CHSB page on the Greenview website. Coefficient of Performance (COP) is not applied when converting chilled water consumption in $kgCO_2e$ because the emissions factor used was already applying a COP of 4.0.

There are two types of emission factors applied to quantify greenhouse gas emissions:

- **Location-Based EFs**—used to quantify greenhouse gas emissions for the CHSB index tool. Location-based EFs are calculated based on the average carbon emissions intensity associated with generating and consuming a specific energy type in a specific geographic location where the facility operated.
- **Market-Based EFs**—used to quantify greenhouse gas emissions for the bespoke benchmark report. Market-based EFs are calculated based on the carbon emissions intensity associated with electricity consumption, factoring in market dynamics, Renewable Energy Certificates (RECs) / Energy Attribute Certificates (EACs), carbon offsets, and residual mix. These EFs go beyond conventional emission factors by integrating market mechanisms.

For energy generated from renewable sources (e.g., wood or other biomass), biogenic CO2 was excluded. However, per the Greenhouse Gas Protocol, emissions from CH4 and N2O were included. An emission factor of zero was assigned to renewable sources such as solar, wind, geothermal, or deep-water cooling.

For more details on the emission factors used, please visit the CHSB2025 Guidance on Emission Factors document.

Global Warming Potentials (GWPs)
In the use of Global Warming Potentials (GWPs) values, Greenview employs distinct methodologies for varying scenarios, as follows:

- When the source document provides separate EF values for CO_2, CH_4, and N_2O, the GWP values from the IPCC Assessment Report version stated in the source document are used to calculate the respective EF values in CO_2e.
- Otherwise, the GWP values from the latest IPCC Assessment Report at the time of calculation are used to derive the Emission Factor in CO_2e. Note that when a change in GWP value occurs due to an update in a more recent IPCC Assessment Report, the GWP values and EFs are not updated retroactively.
- When the emission factor is provided in CO_2e, the source document's GWP values are embedded in the EFs. The EFs provided in CO_2e are used.
- For U.S. properties, EFs for electricity are extracted from eGRID, which uses GWP values from the IPCC Fourth Assessment Report (AR4). Although separate values for CO_2, CH_4, and N_2O are provided, the summation of these three gases does not align with the CO_2e value provided in the eGRID document. To reduce potential calculation errors, align with the other U.S. EPA publications, and streamline the emission calculation process, CO_2e is used.

Location Segmentation

The next step involved segmenting the data set based on geographic location. This was done by geocoding and then clustering each property based on unified boundaries:

- **Market Area**—refers to a large urban area consisting of a major city and its surrounding suburbs or neighboring jurisdictions. This is defined by a metropolitan statistical area (MSA), nation capital region (NCR), or greater metropolitan area. It can also refer to a larger tourist destination consisting of several metropolitan areas.
- **Country**—refers to a political or geographical region that is recognized as an independent state and has its own government and borders.

- **Region**—may refer to a sub-national area such as a state or province, autonomous region, unincorporated territory, or national region, or a transnational area such as a major tourist or urban market that crosses national borders or a regional grouping of countries. We use various geographies to maximize the data output depending on the data received, and to facilitate comparisons and benchmarking.
- **Climate Zone**—based on three classification systems: Köppen-Geiger climate classification system, Bailey's Ecoregions of the World, and WWF Terrestrial Ecoregions of the World. The report applies a dual climate zone framework using established ecological and climatological systems. Climate zone 1 is consistently based on the Köppen-Geiger climate classification system, which categorizes regions globally by temperature and precipitation patterns. This classification is applied to all participating hotels, regardless of country. Climate zone 2 varies by geographic location. For hotels located in the United States, Bailey's Ecoregions of the World is used to assign Climate zone 2. This system categorizes regions based on their ecological characteristics, such as climate, geology, vegetation, and soils. For hotels located outside of the United States, the WWF Terrestrial Ecoregions of the World classification system is used to assign Climate zone 2. This system categorizes regions based on ecological characteristics such as biogeography, climate, vegetation, topography, and biodiversity.

Property Segmentation

To ensure that performance comparisons are meaningful and relevant, the CHSB2025 dataset classifies hotel properties according to a detailed segmentation framework using a revenue-based approach and property-type segmentation similar to that used by STR Global, a CoStar company (based on 2024 global chain scales). These segmentation attributes enable granular benchmarking by accounting for variations in building type, hotel function, and business model.

Key segmentation criteria include:

- **Asset Class**: Hotels are segmented according to operational offerings, either full service or limited service. This accounts for differences in operational intensity and utility consumption driven by amenity levels.
- **Market Segment**: Properties are classified using the STR chain scale segments. The segments are Luxury, Upper Upscale, Upscale, Upper Midscale, Midscale and Economy.
- **Hotel Type Group**: Properties are first classified into two primary groups; resort and non-resort.
- **Hotel Type Sub-Group**: Each group is further segmented into specific sub-groups to reflect distinct property characteristics (e.g., beach resort, airport hotel, integrated resort, all other hotel).
- **Star Rating**: Properties are segmented based on star-level classifications as listed on Expedia if available, or estimated to the best match. The dataset categorizes hotels into five distinct star levels, namely: 1-star, 2-star, 3-star, 4-star, and 5-star. This segmentation enables comparative analysis across varying tiers of service quality and amenity offerings.
- **Location Type**: Hotels are categorized by setting, such as urban, suburban, rural/highway, or small metro/town. This reflects differences in building density, occupancy patterns, and regional infrastructure.

The resulting dataset was then grouped into categories, and an overall grouping was created that combined all segments within a particular geography. Please refer to Exhibit 2 (overleaf) for more details on the groupings.

Validity Testing

To ensure data quality and consistency across the CHSB2025 dataset, the data screening process includes a structured validity testing framework. This framework involves evaluating hotel-level data for logical consistency, completeness, and conformity with expected performance ranges. The tests checked for missing monthly values, month-to-month variance, and extreme outliers for energy, water, occupancy, and floor area data. The aim is to identify potential errors or anomalies to exclude from the benchmarking analysis.

Key components of validity testing:

- **Structural checks**—reviews for all required data for completeness, proper formatting, and logical consistency (e.g., energy or water consumption cannot be negative or zero for an operating property).
- **Range thresholds**—comparison of performance values against the pre-established minimum and maximum thresholds for key indicators (i.e., energy intensity, water intensity). The thresholds were defined by segment (e.g., geographical location, market segment, asset class, hotel type group) and in-

EXHIBIT 2

Segmentation categories

Hotel Type - Group
Resort
Non-Resort
Asset Class
Full-Service Resort
Full-Service Non-Resort
Limited Service
Star Rating
1- and 1.5-Stars Resort
1- and 1.5-Stars Non-Resort
2- and 2.5-Stars Resort
2- and 2.5-Stars Non-Resort
3- and 3.5-Stars Resort
3- and 3.5-Stars Non-Resort
4- and 4.5-Stars Resort
4- and 4.5-Stars Non-Resort
5-Stars Resort
5-Stars Non-Resort
Market Segment
Economy Resort
Economy Non-Resort
Midscale Resort
Midscale Non-Resort
Upper Midscale Resort
Upper Midscale Non-Resort
Upscale Resort
Upscale Non-Resort
Upper Upscale Resort
Upper Upscale Non-Resort
Luxury Resort
Luxury Non-Resort
Hotel Type - Sub-group
Beach Resort
Ski Resort
Integrated Resort
All Inclusive Resort (AIR)
All Other Resort (AOR)
All Suites or Extended Stay Hotel
Airport Hotel
Bed & Breakfast or Inn
Convention or Conference Hotel
All Other Hotel (AOH)
Location Type
Urban Location
Suburban Location
Rural/Highway Location
Small Metro/Town Location

formed by either the prior year's CHSB dataset for energy, carbon, and water, or an outlier analysis for waste.

- **Flags for members' input**—records falling outside expected ranges were flagged to each member for data accuracy review. Based on the validity test results, members have the option to either update their data submission, or to confirm the accuracy of the data.
- **Categorization of outcomes for energy, carbon, and water**—Properties that failed validity tests were removed from the dataset for the corresponding measure. Exhibit 3 presents the summarized list of validity tests conducted on the energy, carbon, and water dataset, with the actions taken if a property failed the test, along with the percentage of the dataset that passed the test. Exhibit 5 provides a count of the data set that were included after validity testing each measure. The percentage calculations excluded properties that were missing the necessary data points to generate the measure. Although it is possible for a property to exceed the threshold due to expansive public areas or amenities, we implemented these limitations to maintain a representative data set.
- **Categorization of outcomes for waste**—Properties that failed validity tests were removed from the dataset for the corresponding measure. Exhibit 4 presents the summarized list of validity tests conducted on the waste dataset, with the actions taken if a property failed the test. Exhibit 6 provides a count of the data set that passed each measure for waste.

For a detailed list of validity tests and their corresponding thresholds, please visit the CHSB 2025 Validity Testing: Energy and Water Fences Document.

EXHIBIT 3

Summarized list of validity tests performed on the energy, carbon, and water dataset

Validity Test Description	High Threshold	Low Threshold	Action Taken If Beyond Threshold or Missing	% of Data Set That Passed
The property underwent significant renovation or closed all or significant part of the floor area for a portion of the year	**N/A**	**N/A**	Excluded from Measures 1-14	**97%**
Energy per occupied room outlier (kWh/ OCRM)	Please Refer to the CHSB 2025 Validity Testing: Energy and Water Fences Document		Excluded from Measures 1,3,5,7	**92%**
Energy per square meter outlier (kWh/m2)			Excluded from Measures 2,4,6,12,13,14	**82%**
The property did not have 12 separate energy data points (representing 12 months in the calendar year)	**N/A**	**N/A**	Notified only, no action was taken	**94%**
The property did not have 12 separate electricity data points (representing 12 months in the calendar year)	**N/A**	**N/A**	Excluded from Measures 1,2,3,4,5,6,7,12,13	**95%**
The property did not have 12 separate occupancy data points (representing 12 months in the calendar year)	**N/A**	**N/A**	Excluded from Measures 1,3,5,7,8,10,11	**94%**
Occupancy outlier	**104%**	**35%**	Excluded from Measures 1,3,5,7,8,10,11	**97%**
The property did not have 12 separate water data points (representing 12 months in the calendar year)	**N/A**	**N/A**	Excluded from Measures 8-11	**93%**
Water per occupied room outlier (L/ocrm)	Please refer to the CHSB 2025 Validity Testing: Energy and Water Fences Document		Excluded from Measure 8,10,11	**86%**
Water per square meter outlier (L/m2)			Excluded from Measure 9	**86%**
% of floor area attributed to rooms footprint	**100%**	**40%**	Excluded from Measures 1,7,10,11	**76%**
Average floor area per guestroom of entire building outlier (m2)	**2,500**	**20**	Excluded from Measures 2,4,6,9	**95%**
The average size of guestroom outliers	**750**	**15**	Excluded from Measures 1,7,10,11	**72%**
Only one source of energy was indicated for calculating the total energy	**N/A**	**N/A**	Notified only, no action was taken	**94%**
More than five sources were indicated for calculating total energy	**N/A**	**N/A**	Notified only, no action was taken	**98%**
At least one energy or water source had a high variance of a ratio of 4 to 1 between high/low months or 80% month-to-month	**N/A**	**N/A**	Notified only, no action was taken	**89%**

EXHIBIT 4

Summarized list of validity tests performed on the waste dataset

Validity Test Description	Action taken if beyond threshold or missing
Property underwent significant renovation or closed all or significant part of floor area for a portion of the year	Excluded from Measures 1-7
Waste per occupied room outlier (kWh/OCRM)	Excluded from Measures 1
Waste per square meter outlier (kWh/m2)	Excluded from Measures 2,5,6,7
The property did not have 12 separate landfilled or incinerated waste data points (representing 12 months in the calendar year)	Excluded from Measures 1,2,5,6,7
The property did not have 12 separate food waste data points (representing 12 months in the calendar year)	Excluded from Measures 3,4,6,7
The property did not have 12 separate occupancy data points (representing 12 months in the calendar year)	Excluded from Measures 1,3
Occupancy outlier	Excluded from Measures 1,3
Food waste per occupied room outlier (L/OCRM)	Excluded from Measure 3
Food waste per square meter outlier (L/m2)	Excluded from Measures 4,5,6,7
Average floor area per guestroom of entire building outlier (m2)	Excluded from Measures 2,4

EXHIBIT 5

Count of data set included for each measure for energy, carbon, and water metrics

Measure	Description	Count of Data Set Included	% Of Measure Included
Measure 1	HCMI[1] footprint per occupied room	19,862	85%
Measure 2	The total carbon footprint of the property divided by the number of rooms	24,600	80%
Measure 3	The total carbon footprint of the property divided by the number of occupied rooms	27,219	90%
Measure 4	The total carbon footprint of the property divided by the total floor area in square meters	24,600	82%
Measure 5	Total energy usage of the property divided by the number of occupied rooms	27,219	90%
Measure 6	Total energy usage of the property divided by floor area of the property in square meters	24,104	82%
Measure 7	HCMI footprint of meeting space per hour per square meter of meeting space	16,105	83%
Measure 8	Total water usage of the property divided by the total number of occupied rooms	24,726	83%

[1] The Hotel Carbon Measurement Initiative, or HCMI, is a globally utilized methodology and tool in the hotel sector for calculating the carbon footprint of guest stays or events in a standardized manner. In this report, for Measure 1 & 7, total emissions are calculated from on-site energy and fuels consumed, as well as emissions from outsourced laundry, following the HCMI 2.0 methodology. However, for mobile fuels and refrigerants, consistent with the guidelines outlined in the Determining Materiality in Carbon Footprinting: What Counts and What Does Not study, emissions from these sources are calculated by adding a standard 1% uplift to the total emissions for each.

Measure 9	Total water usage of the property divided by the floor area of the property in square meters	26,031	89%
Measure 10	HWMI[2] footprint per occupied room	19,224	83%
Measure 11	HWMI footprint of meeting space per hour per square meter of meeting space	15,647	84%
Measure 12	Percentage of property's total energy that is generated from renewable sources (not including the renewable mix of electric power grid)	24,812	81%
Measure 13	Percentage of property's total electricity that is generated from renewable sources (not including the renewable mix of electric power grid)	24,742	81%
Measure 14	Ratio of property's electric energy to its non-electric energy (if the ratio is more than 1, the property uses more electric energy than non-electric energy)	23,369	81%

[2]The Hotel Water Measurement Initiative or HWMI is the industry-accepted way to measure and compare water consumption. In this report, for Measures 10 & 11, total water usage is calculated by combining water consumption from all hotel activities, including direct building use and ancillary activities such as water purchased from municipal suppliers, on-site extraction or harvesting, and water usage from outsourced laundry, following the HWMI 1.1 methodology

EXHIBIT 6

Count of data set included for each measure for waste metrics

Measure	Description	Count of Data Set Included	% of Waste Data Set Included
Measure 1	Total waste of the property divided by the number of occupied rooms	4,566	47%
Measure 2	Total waste of the property divided by the total floor area in square meters	4,567	47%
Measure 3	Total food waste of the property divided by the number of occupied rooms	976	10%
Measure 4	Total food waste of the property divided by the total floor area in square meters	978	10%
Measure 5	Percentage of property's total diverted waste.	551	6%
Measure 6	Percentage of property's total diverted food waste.	39	0.4%
Measure 7	Total food waste of a property for the calendar year, divided by the total waste within the same calendar year period	566	6%

Minimum Threshold

A minimum threshold of five properties for market areas and eight properties for all other geographies was set for the energy, carbon, and water data output. If a particular segment within a market contained at least five properties, or if a particular segment within a region, country, and climate zone contained at least eight properties, the results were included in the index tool. On the other hand, data for geographies that did not meet the minimum threshold were excluded from the final outputs.

With a smaller waste dataset, a minimum threshold of eight properties for countries and only market areas in the United States were set for the waste data output.

DATA OUTPUTS

The CHSB2025 initiative generates structured data outputs to support benchmarking and performance analysis across individual properties and hotel portfolios. These outputs are categorized by their level of accessibility and intended users.

Publicly Available Output for Energy, Carbon, and Water

The CHSB Index Tool (Exhibit 7) is an Excel-based resource published annually via the Cornell Center for Hospitality Research. It compiles aggregated benchmark values for energy, water, and carbon intensity metrics, based on valid hotel data submitted for the relevant calendar year. All carbon metrics presented in the public index tool are calculated with location-based emission factors. The index tool is structured to include:

Measures. The index tool provides benchmark values for fourteen core metrics as listed in Exhibit 5.
Segments. Each measure is segmented across several dimensions:

- *Geography*—Market area, region, country, climate zones
- *Market Segment*—STR chain scale segment, Expedia star rating
- *Property Features*—Asset class, Hotel type group, Hotel type subgroup

EXHIBIT 7

Count of data set included for each measure for waste metrics

CORNELL HOTEL SUSTAINABILITY BENCHMARKING INDEX 2025:
CARBON, ENERGY & WATER

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Select Geography Type :	Country	Select Segment Type :	STR Segment
Select Country :	Singapore	Select STR Segment :	Upscale Segment NonResort
Select Region/Market Area [Optional]* :	Singapore		Reset Selection

2023 CALENDAR YEAR BENCHMARKS								
MEASURE	Count	Low	Lower Quartile	Mean	Median	Upper Quartile	High	SD
MEASURE 1: HCMI Rooms Footprint Per Occupied Room (kgCO2e)	14	14.67	18.61	26.03	24.01	34.05	40.42	8.68
MEASURE 2: Hotel Carbon Footprint Per Room (kgCO2e)	23	3,431.00	4,639.51	6,686.82	5,560.44	8,873.68	12,906.61	2,628.02
MEASURE 3: Hotel Carbon Footprint Per Occupied Room (kgCO2e)	22	10.75	16.85	25.39	23.14	32.11	56.36	11.35
MEASURE 4: Hotel Carbon Footprint Per Square Meter (kgCO2e)	22	39.63	64.54	104.67	88.89	128.36	220.18	47.50
MEASURE 4a: Hotel Carbon Footprint Per Square Foot (kgCO2e)	22	3.68	6.00	9.72	8.26	11.92	20.46	4.41
MEASURE 5: Hotel Energy Usage Per Occupied Room (kWh)	22	25.72	43.24	70.67	56.34	96.10	166.85	38.71
MEASURE 6: Hotel Energy Usage Per Square Meter (kWh)	23	121.27	191.07	297.61	254.39	394.36	589.69	144.59
MEASURE 6a: Hotel Energy Usage Per Square Foot (kWh)	23	11.27	17.75	27.65	23.63	36.64	54.78	13.43
MEASURE 7: HCMI Meetings Footprint Per SQM-HR (kgCO2e)	11	0.0159	0.0531	0.0525	0.0567	0.0601	0.0805	0.0178
MEASURE 8: Hotel Water Usage Per Occupied Room (L)	21	227.47	440.36	643.00	599.97	798.14	1,151.18	287.16
MEASURE 9: Hotel Water Usage Per Square Meter (L)	22	217.33	1,666.97	2,636.00	2,124.59	3,585.08	5,893.40	1,389.38
MEASURE 9a: Hotel Water Usage Per Square Foot (L)	22	20.19	154.87	244.89	197.38	333.07	547.52	129.08
MEASURE 10: HWMI Rooms Footprint Per Occupied Room (L)	13	329.87	470.25	602.70	541.33	788.05	942.61	207.49
MEASURE 11: HWMI Meetings Footprint Per SQM-HR (L)	10	0.6252	0.8583	1.1803	1.1570	1.5228	1.6540	0.3755
MEASURE 12: Hotel Energy from Renewables, Exc. Renewable Mix of Electric Power Grid (%)	23	0.00%	0.00	0.11%	0.00%	0.00%	1.86%	0.40%
MEASURE 13: Renewable Electricity %	23	0.00%	0.00	0.17%	0.00%	0.00%	2.23%	0.54%
MEASURE 14: Ratio of Electric to Non-Electric Energy	11	0.46	0.75	3.32	3.85	5.08	6.29	2.32

Statistics. For each segment, the index tool contains the following summary statistics:

- *Count*—the number of properties included within this geography and segment grouping
- *LOW*—the lowest value found within the geography segment grouping (this is the best performer of the group)
- *Lower Quartile*—the 25-percent marker within the dataset. Twenty-five percent of the properties within the geography and segment were at or below this figure
- *Mean*—the "average" or total output for the corresponding measure for the properties within the geography and segment, divided by the number of corresponding properties
- *Median** —the middle value found within the geography and segment grouping
- *Upper Quartile*—the 75-percent marker within the dataset. Seventy-five percent of the properties within the geography and segment were at or below this figure
- High—the highest value found within the geography segment grouping (this is the worst performer of the group)
- Standard Deviation (SD)—the standard deviation across the data set of properties within the geography and segment.

For detailed instructions on using the CHSB2025 Index Tool (previous page), download the Excel file and refer to the "How to Use" tab within the workbook.

Publicly Available Output for Waste

The CHSB Waste Index is an Excel-based resource published annually via the Cornell Center for Hospitality Research. It compiles aggregated benchmark values for waste intensity metrics, based on valid hotel data submitted for the relevant calendar year. As the first time publishing the results for waste, the waste metrics are kept separate from the index tool for energy, carbon, and water.

The waste index is structured to include:

Measures
The index tool provides benchmark values for seven core metrics as listed in Exhibit 6.

* The median tends to be more representative for benchmarking than the mean. Medians are less sensitive to outliers and skewed data, providing a more reliable central tendency.

Segments
Each measure is segmented across several dimensions:

- *Geography*—Market area (in the United States), country
- *Market Segment*—STR chain scale segment
- *Property Features*—Asset class, Hotel type group

Statistics
For each segment, the index tool contains summary statistics similar to the index tool for energy, carbon, and water. This includes the count, low, lower quartile, mean, median, upper quartile, high, and standard deviation.

Exclusive to Participating Hotels and Companies

The *Hotel Benchmark Report* is a confidential, property-level output provided to participating benchmarking clients. It allows individual hotels to compare their sustainability performance across energy, water, and carbon metrics against a relevant set of peer properties with similar characteristics.

Key components of the report include:

- **Validity Testing Summary** – Displays results of completeness and reasonableness checks for energy, water, occupancy, and floor area data. Properties that fail these tests are flagged, and metrics are excluded from benchmarking where necessary.
- **Segmentation Attributes** – Lists how the property was classified in the benchmarking process - by geography, STR chain scale, star rating, asset class, climate zones, hotel type, laundry inclusion, and other operational characteristics. This classification ensures the identification of the most appropriate peer groups to benchmark against.
- **Performance Metrics and Comparison** – Presents the property's energy (kWh), water (liters), and carbon ($kgCO_2e$) intensity values per occupied room and per square meter. These metrics are compared against a matched peer group determined by segmentation attributes.
- **Market-based emissions calculations** – All carbon metrics calculated and presented in hotel benchmark reports are calculated using market-based emission factors where available, and accounts for market purchases such as RECs and EACs.
- **Benchmark Positioning** – For each metric, the property's performance is placed within a decile tier (e.g., properties in the 2nd decile have lower intensities than 80% of the comp set). The number

of peers in the comparison group, along with the median and average benchmark values are also available within the report.

- **HCMI Footprint Results** – Displays the carbon footprint results in alignment with the Hotel Carbon Measurement Initiative (HCMI), which is used in Scope 3 reporting and travel footprint estimations.
- **Supplementary Report for Waste** – For properties that submitted 2023 waste data, this supplementary report provides the harmonized waste totals, calculated intensities, and validity test results.

The *Portfolio Benchmark Report* is a consolidated Excel-based output provided exclusively to participating corporate members in the CHSB benchmarking initiative. It enables organizations to assess performance across all participating properties in their portfolio.
To view a sample Hotel Benchmark Report and Portfolio Benchmark Report, please visit https://greenview.sg/services/chsb-index/.

KEY FINDINGS AND INSIGHTS

Energy, Carbon, and Water

This section summarizes the findings of the hotel sustainability performance in 2023, in comparison to 2022. The analysis focuses on a like-for-like comparison, where the analytical dataset only includes properties that participated in both CHSB2024 and CHSB2025 with 2022 and 2023 data, respectively. In addition, the analytical boundaries only include hotels that passed validity tests for both cycles for higher accuracy and comparability.

To tease out the trends in consumption patterns, the percentage change in three types of averages is applied to the annual energy, carbon, and water intensities: the average of averages, the overall average change, and the weighted average change. Each of the three averages offers a distinct lens on the performance changes. The average of averages identifies the consistency in trends across all properties, the overall average shows changes in central tendencies, and the weighted average highlights changes based on properties with the largest floor area. Triangulating these averages provides a more holistic understanding of whether improvements are widespread, concentrated on large properties, or skewed by outliers. Refer to Exhibit 8 for a detailed explanation of each average change.

Across GHG emissions, energy, and water, larger properties are driving improvements across the sector. Comparing the three averages, the weighted average changes show more favorable results, with multiple segments showing a decrease in intensities. Across all hotels in this analysis, the weighted average of carbon per square meter decreased by 7.5%, while the other averages show a 1% to 2% increase. Similarly, for the weighted average of energy per square meter, there is an overall decrease of 8.9%, while the other averages show either an increase, or a less significant decrease. For water per square meter, there is an 18.7% decrease in weighted average change, while there was an overall increase in the unweighted averages. With the weighted average giving more weight to larger properties, this observation signals a positive trend in targeted efforts aimed at reducing the footprint where it might matter most.

The results also show varying directions and magnitudes of change between different segments, revealing the uneven progress across the hospitality sector. Between resorts and non-resorts, non-resorts show better performances, with more improvements across the averages for energy, carbon, and water intensities. By carbon per square meter, resorts saw a higher increase across all three averages, ranging between 0.2% to 7.1%. As for non-resorts, the weighted average had a 7.7% decrease, and the other averages showed a smaller magnitude of increase from 1.0% to 1.9%. By energy per square meter, resorts showed increases across all three averages, ranging from 0.4% to 6.1%, while non-resorts showed decreases in all three averages, ranging from 0.1% to 9.3%. By water per square meter, resorts had a weighted average increase of 0.5%, while non-resorts had a weighted average decrease of 19.2%. Segmenting the hotels by either STR chain scales or Expedia stars shows a similar pattern, where higher-end segments tend to show less favorable results for the floor area intensities.

Across the three tables segmented by property type, STR segment, and Expedia star rating, a clear divergence emerges between intensities by floor area and intensities by occupancy. Metrics based on occupied rooms tend to show more consistent improvements across most segments. In contrast, the per square meter intensities are in the opposite direction, with greater increases for the higher-end tiers. For instance, luxury hotels show strong improvements in GHG emissions per occupied room, with an overall average decrease

EXHIBIT 8

Types of averages

Type of average	Description	Calculation of Average	Use cases
The Average of Averages	The average of averages change is the mean of individual property-level percentage changes.	Each property's change in intensity is calculated first and then averaged across all properties in the like-for-like dataset	Since this method gives equal weight to every property, it is useful to understand the performance trend across the dataset, gauge the breadth of change, and identify if most properties have improved or declined
The Overall Average	The overall average change tracks how the portfolio-wide average of a specific metric has changed between two time periods	The total usage or emissions of the like-for-like dataset is divided by its total floor area.	This metric provides a high-level view of whether the overall performance is trending upwards or downwards. While it provides a straightforward snapshot, it can be heavily influenced by extreme values.
Weighted Average Change	The weighted average change adjusts for the scale of each property, calculating the performance changes by weighting them based on their floor area.	Each property's change in intensity is multiplied by the percentage of its floor area in the like-for-like dataset.	This approach ensures that properties with larger floor areas have a greater influence on the result. This metric is useful in assessing how performance is evolving among larger properties and highlighting the proportion of their impact.

EXHIBIT 9

Year-over-year average change by measure, all hotels, resorts, non-resorts, and service class

Measure	Metric	All	Resort	Non-Resort	Full-Service Resort	Full-service NonResort	Limited Service
Measure 3: GHG Emissions per Occupied Room	Average of Averages Change	0.7%	-0.2%	0.8%	-0.2%	0.2%	1.0%
	Overall Average Change	-4.8%	-6.6%	-4.7%	-6.6%	-6.6%	-4.2%
	Weighted Average Change	-1.4%	-0.5%	-0.9%	-0.5%	-2.1%	1.2%
Measure 4: GHG Emissions per Square Meter	Average of Averages Change	1.3%	7.1%	1.0%	7.1%	1.5%	0.7%
	Overall Average Change	2.0%	2.6%	1.9%	2.6%	3.4%	-1.2%
	Weighted Average Change	-7.5%	0.2%	-7.7%	0.2%	-5.1%	-2.6%
Measure 5: Energy per Occupied Room	Average of Averages Change	-2.7%	-2.1%	-2.7%	-2.1%	-3.8%	-2.1%
	Overall Average Change	-6.5%	-6.8%	-6.5%	-6.8%	-8.1%	-6.4%
	Weighted Average Change	-3.7%	-0.4%	-3.3%	-0.4%	-3.0%	-0.3%
Measure 6: Energy per Square Meter	Average of Averages Change	-1.4%	6.1%	-1.8%	6.1%	-1.9%	-1.8%
	Overall Average Change	0.3%	2.3%	-0.1%	2.3%	1.7%	-3.4%
	Weighted Average Change	-8.9%	0.4%	-9.3%	0.4%	-5.7%	-3.5%
Measure 8: Water per Occupied Room	Average of Averages Change	2.7%	-1.7%	3.0%	-1.7%	3.5%	2.7%
	Overall Average Change	-5.4%	-16.7%	-2.2%	-16.7%	-3.0%	-3.0%
	Weighted Average Change	0.8%	-0.4%	1.1%	-0.4%	0.5%	0.6%
Measure 9: Water per Square Meter	Average of Averages Change	2.2%	10.1%	1.7%	10.1%	12.5%	-3.7%
	Overall Average Change	1.3%	-10.2%	4.5%	-10.2%	7.5%	0.0%
	Weighted Average Change	-18.7%	0.5%	-19.2%	0.5%	-4.2%	-15.0%

Exhibit 10

Year-over-year average change by measure, STR segment

Measure	Metric	Luxury	Upper Upscale	Upscale	Upper Midscale
Measure 3: GHG Emissions per Occupied Room	Average of Averages Change	-7.0%	-3.0%	-1.2%	3.9%
	Overall Average Change	-11.1%	-6.0%	-4.9%	-4.0%
	Weighted Average Change	-1.0%	-1.8%	-0.6%	1.9%
Measure 4: GHG Emissions per Square Meter	Average of Averages Change	12.6%	4.5%	1.7%	3.2%
	Overall Average Change	4.4%	2.9%	0.1%	0.5%
	Weighted Average Change	-0.1%	0.7%	-0.9%	-6.4%
Measure 5: Energy per Occupied Room	Average of Averages Change	-8.3%	-4.9%	-3.1%	-0.9%
	Overall Average Change	-12.8%	-7.3%	-6.2%	-6.3%
	Weighted Average Change	-1.0%	-2.1%	-0.9%	0.3%
Measure 6: Energy per Square Meter	Average of Averages Change	10.8%	2.4%	-0.2%	-0.2%
	Overall Average Change	2.4%	1.5%	-1.2%	-2.0%
	Weighted Average Change	-0.1%	0.4%	1.1%	7.1%
Measure 8: Water per Occupied Room	Average of Averages Change	-3.5%	0.6%	3.5%	2.6%
	Overall Average Change	-16.9%	-7.1%	-1.2%	-3.2%
	Weighted Average Change	-0.4%	-0.2%	0.7%	0.4%
Measure 9: Water per Square Meter	Average of Averages Change	15.1%	10.7%	6.9%	-6.6%
	Overall Average Change	-3.8%	1.2%	3.9%	1.1%
	Weighted Average Change	-0.2%	2.6%	-2.0%	-17.2%

EXHIBIT 11

Year-over-year average change by measure, Expedia stars

Measure	Metric	5 Stars	4 Stars	3 Stars	2 Stars
Measure 3: GHG Emissions per Occupied Room	Average of Averages Change	-7.5%	-0.8%	0.2%	3.9%
	Overall Average Change	-13.0%	-5.6%	-4.1%	-4.2%
	Weighted Average Change	-1.3%	-1.6%	0.0%	1.6%
Measure 4: GHG Emissions per Square Meter	Average of Averages Change	8.1%	8.6%	0.3%	-3.1%
	Overall Average Change	-0.2%	5.2%	0.0%	-1.8%
	Weighted Average Change	-0.2%	1.4%	-6.0%	-2.7%
Measure 5: Energy per Occupied Room	Average of Averages Change	-7.8%	-4.0%	-2.5%	-1.0%
	Overall Average Change	-12.8%	-7.3%	-6.2%	-6.6%
	Weighted Average Change	-1.2%	-2.2%	-0.7%	0.4%
Measure 6: Energy per Square Meter	Average of Averages Change	7.8%	5.4%	-2.2%	-6.2%
	Overall Average Change	0.0%	3.3%	-2.2%	-4.4%
	Weighted Average Change	-.01%	1.0%	-6.5%	-3.2%
Measure 8: Water per Occupied Room	Average of Averages Change	1.0%	2.9%	2.5%	3.2%
	Overall Average Change	-11.9%	-6.7%	-4.5%	-2.6%
	Weighted Average Change	-0.1%	0.1%	0.5%	0.3%
Measure 9: Water per Square Meter	Average of Averages Change	19.9%	17.9%	2.1%	-12.0%
	Overall Average Change	0.2%	3.4%	-0.4%	-0.3%
	Weighted Average Change	1.4%	2.0%	-9.4%	-12.7%

of 11.1%, indicating a lower footprint per guest. Yet, the GHG emissions per square meter have an overall average increase of 4.4%, signaling an overall increase in absolute emissions from hotel properties. A similar pattern emerges in 5-star hotels, where the overall average energy use per occupied room improved by 12.8%, but the overall average energy use per square meter increased by 2.4%. Conversely, 2-star hotels and hotels in the upper midscale segments show the reverse, with modest or negative performance by occupied room intensity, but more improvements by square meter. This observation can be explained by the increase in occupancy between 2022 and 2023. Among hotels that were present in both the 2022 and 2023 dataset, the number of occupied rooms increased by 9.8%. This average change is calculated from a subset of hotels regardless of market or segment, and thus, not representative of the entire industry. Overall, despite increases in floor area intensities, the reduction in occupied room intensities point to improved building-level efficiencies.

For details on the average annual average change for carbon emissions, energy, and water intensity metrics by individual segments, and for more insights and details about the dataset, visit https://greenview.sg/resources/chsb-index/

This includes Exhibits 9, 10, and 11, which present: Year-over-year average change by measure, all hotels, resorts, non-resorts, and service class; year-over-year average change by measure, STR segment; and year-over-year average change by measure and Expedia stars.

Waste

The CHSB Index saw participation from over 31,500 hotels and resorts globally. While reporting on energy, water, and carbon emissions was strong, yielding more than 23,000 valid data sets per metric, waste data proved far less robust. Only 9,800 properties submitted general waste data, and of those, just over 4,500 were deemed valid. The data set shrinks further for food waste, with only 1,940 properties that submitted food waste data. This limited response underscores the ongoing challenges in waste data collection and the comparatively low awareness surrounding waste management in the hospitality sector.

Despite the smaller data pool, this initiative marks the first global benchmarking of waste in the hospitality industry and still provides meaningful insights. For example, when comparing waste intensity, resorts generated three times more waste per occupied room than non-resorts, which reported an average of 1.16 kg per occupied room (OCRM). This discrepancy likely stems from the design of guest experience: resorts, often located in remote areas, offer comprehensive dining and entertainment services on-site, whereas urban hotels tend to have smaller in-house operations due to greater off-property dining and leisure alternatives.

Similar patterns emerged across STR market segments. Luxury hotels recorded the highest waste intensity at 5.49 kg/OCRM, followed by upper upscale, upscale, upper midscale, and midscale segments, with the latter averaging 0.78 kg/OCRM. Additionally, full-service hotels were found to generate twice the waste of limited-service hotels, reinforcing the correlation between operational complexity and waste generation. Exhibit 12 and Exhibit 13 present the annual average waste intensity metrics by individual segments. For more details about the dataset, visit https://greenview.sg/resources/chsb-index/

Regional trends further highlighted variability in waste generation. The Middle East reported the highest total waste per occupied room at 2.3 kg/OCRM, followed by Oceania and Africa. North America (including the U.S., Canada, and Bermuda) had the lowest rate at 1.14 kg/OCRM.

Food waste data was even more limited: only 1,940 properties reported food waste metrics. Among these hotels, only 212 submissions included data on non-diverted food waste. After applying quality controls, just 39 records met the criteria for food waste diversion rate calculations.

Regionally, Latin America and the Caribbean had the highest food waste intensity at 0.69 kg/OCRM, followed closely by Asia at 0.61 kg/OCRM. The Middle East again recorded the lowest intensity at 0.18 kg/OCRM. In North America, the U.S. reported 0.25 kg/OCRM, slightly higher than Canada's 0.20 kg/OCRM, and approximately half of China's 0.55 kg/OCRM.

These metrics contribute to the Food Waste Benchmarking Report, a comprehensive study on food waste practices, disclosure, and reduction efforts across the hospitality industry. The report is the result of a collaboration between the U.S. Food Waste Pact, Greenview, the American Hotel & Lodging Association (AHLA), and the Cornell University Center for Hospitality Research.

EXHIBIT 12

Annual average waste intensity metrics by resorts, non-resorts, and service class

Measure	Resort	NonResort	Full Service Resort	Full Service NonResort	Limited Service
MEASURE 1: Waste Per Occupied Room (kg)	4.84	1.16	5.15	2.49	1.08
MEASURE 2: Waste Per Square Meter (kg)	13.21	4.68	13.12	7.09	4.45
MEASURE 3: Food Waste Per Occupied Room (kg)	0.74	0.28	0.80	0.38	0.11
MEASURE 4: Food Waste Per Square Meter (kg)	1.57	0.90	1.57	1.04	0.53
MEASURE 5: Waste Diversion Rate (%)	23.71	28.60	23.71	33.63	17.80
MEASURE 7: Food Waste Ratio	0.11	0.10	0.11	0.12	0.06

EXHIBIT 13

Annual average waste intensity metrics by STR segment

Measure	Luxury	Upper Upscale	Upscale	Upper Midscale
MEASURE 1: Waste Per Occupied Room (kg)	5.49	2.19	1.20	1.04
MEASURE 2: Waste Per Square Meter (kg)	13.12	6.19	5.16	4.27
MEASURE 3: Food Waste Per Occupied Room (kg)	1.03	0.36	0.19	0.14
MEASURE 4: Food Waste Per Square Meter (kg)	2.22	0.99	0.64	0.64
MEASURE 5: Waste Diversion Rate (%)	30.84	28.78	27.58	20.02
MEASURE 7: Food Waste Ratio	0.13	0.11	0.10	0.09

APPLICATIONS OF CHSB

The CHSB dataset and benchmark outputs serve a wide range of stakeholders across the hotel industry and beyond. By providing standardized, validated data on sustainability performance, CHSB supports operational decision-making, sustainability strategy, reporting, and policy development.

Hotels

Individual properties use CHSB benchmarks to compare their sustainability performance (energy, water, and carbon) against similar hotels in terms of geography, classification, and operational characteristics. This helps identify underperformance and prioritize efficiency improvements.

Hotel Companies

Multi-property owners and operators leverage CHSB for internal portfolio benchmarking. The data supports ESG target tracking, sustainability reporting, and identifying regional or segment-specific performance gaps. For hotel companies compiling GHG inventories, CHSB offers reliable emission factors that can be used to estimate or supplement carbon emissions for properties with incomplete utility data.

Carbon Accounting

Companies engaged in business travel use carbon intensity values from CHSB to estimate Scope 3 emissions associated with employee hotel stays. For organizations reporting under the Greenhouse Gas Protocol, CHSB provides a credible and standardized source of hotel emission factors for calculating Scope 3 Category 6 emissions. Its segment-specific data enhances the accuracy of carbon footprint accounting and sustainability reporting.

Travel Industry

Travel management companies and online booking platforms incorporate CHSB emission data to estimate the carbon footprint of hotel bookings on behalf of travel buyers. This supports transparency and climate reporting in the travel and tourism value chain.

Destinations

Tourism authorities and destination management organizations use CHSB data to benchmark the sustainability performance of local hotels. By leveraging actual hotel data, destinations can establish credible baselines and track annual progress toward greater operational efficiency. These insights support broad sustainability initiatives and enable effective planning and implementation of destination-wide decarbonization pathways.

Policy Makers

Regulatory and advisory bodies refer to CHSB values when developing emission factors, energy performance guidance, or sustainability benchmarking tools. CHSB's robust data foundation ensures policy decisions are grounded in industry-representative evidence.

Offsetting

Carbon consultants and offsetting platforms use CHSB emission estimates as proxies for properties lacking direct data. This helps calculate hotel-related emissions and supports offsetting efforts in corporate sustainability programs.

Research

Academics and industry researchers rely on CHSB as a primary source for empirical analysis in sustainability, including decarbonization modeling, climate scenario testing, and footprint estimations. The database supports peer-reviewed studies and institutional research agendas.

In addition, CHSB data powers the Greenview Hotel Footprinting Tool, allowing the estimation of the carbon footprint of hotel stays or meetings around the world. This is a useful tool to determine the carbon footprint of hotel bookings and calculate Scope 3 business travel emissions, supporting efforts for net-zero calculations and offsetting. For more information about the tool, please visit https://greenview.sg/resources/hotel-footprinting-tool/ ■

Become a CHSB Member

The CHSB membership is open year-round to hotels of all sizes and types, whether independent, managed, or part of a chain. Submit data and benchmark any time.
For more information on how to participate, contact data@greenview.sg.

Appendix 1

Data collection points used to generate the external CHSB2025 benchmarks

Data Point	Description
Internal Brand Code	Unique identifier code used by the property's parent brand.
Participant Code	Unique identifier code used by the participating entity, if different from the brand code. For example, an owner of a franchisee of a portfolio of hotels may use separate identifiers, to avoid duplication of properties within the data set.
Hotel Name	Name of hotel.
Address	Street address of the hotel.
City	City where the hotel is located.
State or Province	State or province where the hotel is located.
Country	Country where the hotel is located.
Postal Code	Postal code (i.e., zip code) where the hotel is located.
Brand Flag	Name of the brand that the property is operating under.
STR Market Segment	Chain scale segment according to STR Global Chain Scales.
Asset Class	The service class of the property, either Full Service or Limited Service.
Hotel Type – Group	Type of hotel, either Resort or Non-resort
Hotel Type – Sub-group	The specific type of resort or non-resort. The types of resorts include Beach Resort, Ski Resort, Integrated Resort, All Inclusive Resort (AIR), All Other Resort (AOR). The types of non-resorts include All Suites or Extended Stay Hotel, Airport Hotel, Bed & Breakfast or Inn, Convention or Conference Hotel, Lifestyle Hotel, All Other Hotel (AOH).
Hotel Operational Type	Type of property based on when it is open and operational, either Year-Round, Summer Seasonal, or Winter Seasonal.
Expedia Stars	Number of stars listed in Expedia (or estimated where not found). Half stars are rounded down (i.e. 2.5 stars = 2 stars).
Location Type	The location segment of the property: Urban, Suburban, Rural/Highway, Small Metro/Town.
Room Count	The total number of guestrooms for the hotel in 2023. If a hotel's room count changed during the year, the value most representative of the hotel's room count for 2023 was used.
Area Unit	Choose either "sqft" or "sqm" to indicate the units of measurement of the floor area data being entered (either square feet or square meters).
Total Conditioned Space Area	Total floor area of a property that is heated or cooled. The total conditioned space value should equal Rooms Area + Meeting Space Area + Other Area.
Rooms Area	Total area of conditioned space of the rooms and corridors, per the HCMI guidance.

Data collection points used to generate the external CHSB2025 benchmarks

Data Point	Description
Meeting Space Area	Total area of conditioned space of the meeting space and pre-function space in the hotel, per HCMI guidance.
Other Area	The total remaining area of conditioned space within the property is not covered by rooms and meeting space.
Total Built Area	The total built floor area of the entire property.
Year Opened	The year the property originally opened, regardless of whether major renovations have occurred since that year.
Laundry	Choose either "Included" or "Not Included" to denote whether the energy consumption includes the washing of bedroom linens. For properties with partial in-house wash, the determining factor is whether bedroom linens are included in that wash. For example, linen wash of restaurant linens or guest clothing only, would be considered "not included."
12-Month Operation	Confirm with a "Yes" that the hotel was in operation for all of 2023 without any shutting down or major renovation that would significantly alter the energy consumption or occupancy (either rooms or meeting space) during the period.
Energy Verification	Indicate whether the energy data for each property has been 3rd party verified, picking from the following choices: Limited, Reasonable, Full, No, and Don't know. Limited refers to a company-wide 3rd party "limited assurance", Reasonable refers to a companywide 3rd party "reasonable assurance" and "full" indicates that the specific property's data have been 3rd party verified onsite or through direct examination of billing and consumption.
Water Verification	Indicate whether the water data has been 3rd party verified per the following choices: Limited, Reasonable, Full, No, Don't know. Limited refers to a company-wide 3rd party "limited assurance", Reasonable refers to a companywide 3rd party "reasonable assurance" and "full" indicates that the specific property's data have been 3rd party verified onsite or through direct examination of billing and consumption.
Unit	Enter the unit of measurement for the data entered.
Occupied Rooms	The total number of occupied rooms for the hotel for each month in 2023. Rooms sold may be used as a proxy.
Water Consumption by Type	The total water consumption for each month in 2023, as provided by the utility provider by type of water source. For a detailed description of the boundary, please refer to Appendix 2, which outlines the included and excluded water types.

Appendix 2

List of water types included and excluded from the analysis

Water Type	Boundary
Desalinated Water	Included
Purchased Recycled Water	Included
Purchased Water	Included
Rainwater	Included
Tanker Water	Included
Water Withdrawal	Included
Cooling Tower Evaporation	Excluded
Landscaping or Other Irrigation (Discharge)	Excluded
Other Discharge	Excluded
Packaged Drinking Water	Excluded
Sewer Discharge	Excluded
Waste Water Treatment	Excluded
Water Recycled	Excluded

Appendix 3

List of energy types included and excluded from the analysis

Energy Type	Boundary
Bio-Diesel (Stationary)	Included
Bioethanol	Included
Biofuel Landfill Gas (50/50)	Included
Biofuel Used Oil	Included
Biofuel Wood Waste	Included
Biofuel-Vegetable Oil (Stationary)	Included
Biogas (Captured Methane)	Included
Biomass	Included
Butane	Included
Charcoal	Included
Coal Gas	Included
Compressed Natural Gas (CNG) (Stationary)	Included
Diesel (Stationary)	Included
Ethanol	Included
Fuel Oil #1	Included
Fuel Oil #2	Included
Fuel Oil #4	Included
Fuel Oil #5	Included
Fuel Oil #6	Included
Gasoline (Stationary)	Included
Kerosene	Included
Liquefied Petroleum Gas (LPG) (Stationary)	Included
Natural Gas	Included
Onsite Geothermal Energy	Included
Onsite Solar PV Electricity	Included
Onsite Solar Thermal	Included
Onsite Wind Power Electricity	Included
Other Onsite Renewable Energy	Included
Purchased Chilled Water (included as energy source)	Included
Purchased Electricity	Included
Purchased Heat	Included
Purchased Hot Water	Included
Purchased Renewable Energy	Included
Purchased Steam	Included
Town Gas (Hong Kong)	Included
Town Gas (Singapore)	Included
Town Gas (Tokyo)	Included
Town Gas / City Gas	Included
Bio-Diesel (Mobile)	Excluded
Biofuel-Vegetable Oil (Mobile)	Excluded
Compressed Natural Gas (CNG) (Mobile)	Excluded
Diesel (Mobile)	Excluded
Gasoline (Mobile)	Excluded
Gasoline Biofuel Blend (Mobile)	Excluded
Liquefied Natural Gas (LNG) (Mobile)	Excluded
Liquefied Petroleum Gas (LPG) (Mobile)	Excluded
Propane (Mobile)	Excluded

*Mobile fuels and refrigerants are excluded from the analysis, except where specified.

Appendix 4

List of waste types included and excluded from the analysis

Waste Type	Boundary
Commingled Recyclables	Included
Landfilled Waste	Included
Batteries - Recycled	Included
Bottled Amenities and Soap Bars - Recycled	Included
Bottles & Cans - Recycled	Included
Cardboard - Recycled	Included
E-waste - Donation	Included
E-waste - Recycled	Included
Food Waste - Compost	Included
Food Waste - Donation	Included
Food Waste - Energy	Included
Food Waste - Farm Feed	Included
Food Waste - Landfilled	Included
Food Waste - Sewer	Included
Garden Waste - Diverted	Included
General Donations (On-Going Consumables)	Included
Hazardous Waste Disposed	Included
Incinerated Waste (Offsite)	Included
Incinerated Waste (Onsite)	Included
Kitchen Grease - Recycled	Included
Light Bulbs - Recycled	Included
Mixed Glass - Recycled	Included
Mixed Metals - Recycled	Included
Paper - Recycled	Included
Plastic - Recycled	Included
Durable Goods	Excluded
Construction & Demolition Waste	Excluded

ABOUT THE AUTHORS

Rehmaashini Jagarajan is a Senior Manager at Greenview with a primary role in data management and measurement, data platform enhancements, programs development and implementation, reporting, and research services in the areas of corporate responsibility and sustainability. She is an expert in processing, manipulating, analyzing and interpreting large data sets to identify trends and patterns and can communicate the findings efficiently.

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