Standardised Weather Data for the FHS Wrapper

A technical explanation of the assumptions

March 2026

Acknowledgements

This methodology has been developed for the Department for Energy Security & Net Zero by a number of organisations and individuals, including Sustenic, Quidos, Scene Connect, City Science, Hoare Lea, Oxford Brookes University, University of Bath, 10-x, Building Research Establishment (BRE), AECOM, Kiwa Ltd., Loughborough University Enterprises Limited, Chris Martin and John Tebbit.

Quality assurance has been undertaken by a consortium led by Etude, including Levitt Bernstein, People Powered Retrofit, University of Strathclyde's Energy Systems Research Unit, Julie Godefroy Sustainability, and UCL.

Document reference: HEMFHS-TP-10

Document version: v1.0

Issue date: March 2026

Home Energy Model: FHS assessment version: 1.0

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Contents

Background to the Home Energy Model: Future Homes Standard assessment

What is the Home Energy Model: Future Homes Standard assessment?

The Home Energy Model: Future Homes Standard assessment is a calculation methodology designed to assess compliance with the 2025 Future Homes Standard (FHS). It builds on the government's Home Energy Model, which will replace the government's Standard Assessment Procedure (SAP).

Where can I find more information?

This document is part of a wider package of material relating to the Home Energy Model:

Home Energy Model: FHS assessment technical documentation (e.g. this document)

What: This document is one of a suite of technical documents, which explain the approach to developing the standard assumptions and methodology used in the wrapper.

Audience: The technical documentation will be of interest to those who want to understand the justifications and evidence base behind the assumptions used in the model.

The Home Energy Model: Future Homes Standard assessment consultation and government response

What: The Home Energy Model: Future Homes Standard (FHS) assessment consultation sought views on the proposed methodology for demonstrating compliance with the FHS.

Audience: The consultation and response will be of interest to those who want to understand the proposed standardised assumptions around occupancy, energy demand etc. to be used when assessing compliance with the FHS, as well as the methodology for the calculation of the proposed FHS compliance metrics.

The Home Energy Model reference code

What: The full Python source code for the Home Energy Model FHS wrapper has been published as a Git repository. Note the reference code for the HEM core engine is published as a separate repository.

Audience: The reference code will be of interest to those who want to understand how the model has been implemented in code, and those wishing to fully clarify their understanding of the new methodology. It will also be of interest to any potential contributors to the Home Energy Model or those wishing to use it within their own projects.

Future Homes and Buildings Standards Government Response

What: The FHS consultation and response sets out the feedback received to the 2023 consultation on proposed Part L standards, and details the new regulations being introduced.

Audience: The consultation and response will be of interest to those wishing to understand the incoming standards for Building Regulations Part L.

Related Content

To understand how this methodology has been implemented in computer code, please see:

src/fhs.py

Standardised Weather Data

Overview

To define the external conditions of dwellings, HEM accepts weather data in either EPW or CIBSE format, as described in the core technical paper *HEM-TP-03 External Conditions*. In the FHS wrapper, all dwellings are assessed using a single representative weather dataset[1], which represents a Typical Meteorological Year (TMY) at RAF Bedford[2]. The data are held in EPW format, sourced from climate.onebuilding.org[3] (COB) and created by COB authors according to methodology defined in BS EN ISO 15927-4:2005[4]. This methodology creates a typical year of weather, where each calendar month is an actual month of historical data. Historic months are selected for the similarity of their temperature, solar irradiance, humidity, and wind speed to the long-term average of the dataset. HEM:FHS uses a TMY developed from data spanning 2009–2023[5].

The EPW file from COB was then adjusted to include more accurate solar data, by swapping the original data sourced from ERA5[6] with the equivalent from Copernicus Atmosphere Monitoring Service (CAMS). The methodologies for selecting the representative location and adding the CAMS data are described in more detail in the following section.

Representative location selection

RAF Bedford was selected as the representative location for England from the 120 locations available at COB that use data from 2009–2023. Using a process similar to BS EN ISO 15927-4:2005, each location was compared to the national average, to identify a location with daily mean temperature, humidity, solar irradiance, and windspeed closest the national mean.

For dry bulb temperature, global horizontal irradiance, and humidity, the following steps were taken.

1. For each TMY file, the 24-hour mean was calculated for each day of the year using Equation 1. The mean is denoted by $\bar{x}$, p is the weather parameter, d is the day of the

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[1] The consultation version of HEM:FHS included a number of weather files for different locations. The use of a representative national file helps ensure consistent outcomes between HEM:FHS and SAP 10.3 for Part L assessments.
[2] World Meteorological Organisation (WMO) ID: 034820; latitude: 52.65140; longitude: 0.56610.
[3] Lawrie, Linda K, Drury B Crawley. 2022. Development of Global Typical Meteorological Years (TMYx). https://climate.onebuilding.org
[4] BS EN ISO 15927-4:2005, Hygrothermal performance of buildings — Calculation and presentation of climatic data, Part 4: Hourly data for assessing the annual energy use for heating and cooling.
[5] Lawrie, Linda K, Drury B Crawley. 2024. GBR_ENG_RAF.Bedford.035600_TMYx.2009-2023. https://climate.onebuilding.org/WMO_Region_6_Europe/GBR_United_Kingdom/ENG_England/GBR_ENG_RAF.Bedford.035600_TMYx.2009-2023.zip.
[6] ERA5 is the fifth-generation reanalysis for the global climate and weather from the European Centre for Medium-Range Weather Forecasts. Copernicus Climate Change Service (2025): ERA5 hourly time-series data on single levels from 1940 to present. Copernicus Climate Change Service (C3S) Climate Data Store (CDS). Available at: https://cds.climate.copernicus.eu/datasets/reanalysis-era5-single-levels-timeseries.

year, l is the location (or TMY file), h is the hour, and $n^{hd} = 24$ and is the number of hours in the day.

$$\bar{x}_{p,d,l} = \frac{1}{n^{hd}} \sum_{h=1}^{n^{hd}} x_{p,d,h,l} \quad \textbf{1}$$

2. The 24-hour means for all locations were sorted smallest to largest, and the national cumulative distribution (CDF) function was calculated using Equation 2, where ϕ is the cumulative distribution function, p is the weather parameter, K is the rank order of value i, and N is the number of 24-hour means in the national dataset.

$$\phi_{p,i} = \frac{K_i}{N+1} \quad \textbf{2}$$

3. For each location, the 24-hour means were sorted smallest to largest, and the CDF was calculated using Equation 3, where F is the cumulative distribution function and n is the number of 24-hour means at one location (equal to 365).

$$F_{p,l,i} = \frac{K_i}{n+1} \quad \textbf{3}$$

4. For each location and parameter, the Finkelstein-Schafer (FS) statistic[7], $FS_{p,l}$ was calculated by comparing the local and national cumulative distribution functions, using Equation 4.

$$FS_{p,l} = \sum_{i=1}^{n} \left| F_{p,l,i} - \phi_{p,i} \right| \quad \textbf{4}$$

5. For each parameter, the locations were ranked from smallest FS statistic to largest and a total rank was calculated for each location by summing the three parameter ranks.
6. For each of the three locations with the lowest total rank, the annual mean wind speed[8] was calculated using Equation 5, where $p = windspeed$ and $n^{hy} = 8760$ and is the number of hours in the year.

$$\bar{x}_{p,l} = \frac{1}{n^{hy}} \sum_{h=1}^{n^{hy}} x_{p,h,l} \quad \textbf{5}$$

7. The national mean windspeed was calculated using Equation 6, where $p = windspeed$ and n^{l} is the number of locations, in this case 120.

[7] This method is used by BS EN ISO 15927-4:2005 and provides a measure of the similarity between two distributions. Used here, it ensures that the distributions of the climate variables considered in the selected representative location are similar to those of the national dataset.
[8] Including wind at this stage rather than weighted alongside the other climate variables is in line with BS EN ISO 15927-4:2005.

$$\bar{x}_p = \frac{1}{n^{hy} n^l} \sum_{l=1}^{n^l} \sum_{h=1}^{n^{hy}} x_{p,h,l} \quad (6)$$

8. The difference between the local and national mean windspeed was calculated using Equation 7.

$$\Delta\bar{x}_{p,l} = \left|\bar{x}_{p,l} - \bar{x}_p\right| \quad (7)$$

9. From the three locations with the lowest total rank, the location with the lowest $\Delta\bar{x}_{p,l}$ was RAF Bedford and this was selected as the nationally representative TMY file.

The outputs of this selection process for the top three ranked weather files are shown in **Error! Reference source not found.**. RAF Bedford ranked second in the overall rank and had the lowest difference between its mean windspeed and the national mean.

Table 1: Finkelstein-Schafer statistic, ranking, and difference in mean windspeed between each location and the national for the top three ranked TMY locations. Selected station, RAF Bedford, highlighted.

Selected weather location	Dry bulb temperature		Humidity FS		Global horizontal irradiance FS		Overall Rank	Mean windspeed difference (m/s)
	FS	Rank	FS	Rank	FS	Rank		
Church Lawford	0.058	22	0.051	1	0.047	15	38	1.61
RAF Bedford	0.056	1	0.074	39	0.039	7	47	0.35
Shobdon AF	0.058	29	0.060	8	0.049	13	50	1.63

Solar data: supplementing with data from CAMS

Studies validating solar data against ground observations have found that CAMS data tend to be more accurate than ERA5[9]; and in the UK specifically, CAMS has been shown to have good agreement with ground measurements[10]. To improve the quality of the COB EPW file, data for the three solar parameters – global horizontal irradiance (GHI), direct normal irradiance (DNI), and diffuse horizontal irradiance (DHI) – were replaced with the equivalent data from CAMS[11]. Data were matched based on the longitude, latitude, elevation, and time (including year) specified in the COB file. All other data in the RAF Bedford TMY remain the same as COB. Quality assurance was carried out to assess the validity of swapping this data after the TMY creation process, which is described in the following section.

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[9] Yang, D. and Bright, J.M., 2020. Worldwide validation of 8 satellite-derived and reanalysis solar radiation products: A preliminary evaluation and overall metrics for hourly data over 27 years. *Solar Energy*, *210*, pp.3-19.

[10] Mardaljevic, J., Brembilla, E. and Eames, M., 2025. Daylight solar radiation AMY data derived from satellite remote sensing: Validation against ground measurements and comparison with TMYs. *Building Services Engineering Research & Technology*, *46*(5), pp.653-691.

[11] Copernicus Atmosphere Monitoring Service (2020): CAMS solar radiation time-series. Copernicus Atmosphere Monitoring Service (CAMS) Atmosphere Data Store, DOI: 10.24381/5cab0912

Quality assurance

Weather data

Data quality checks were carried out in addition to that conducted by the authors of each data source[12]. These included:

- Ensuring all required timesteps and values were present (COB and CAMS).
- Ensuring there were no zero values for humidity and windspeed (COB) or solar variables (CAMS).
- Outlier checks of the COB data, comparing the monthly summary statistics (min, max, mean, median, number of entries less than 0, and number of 0 value entries) for each variable[13] across all locations. Confidence intervals were calculated at mean ± 1.96 and 3 standard deviations and values outside these intervals were flagged for more manual checks. The summary statistics for RAF Bedford all fell within these confidence intervals.

In addition, the data for RAF Bedford were compared with the relevant observation data published by the Met Office[14] for dry bulb temperature, windspeed, wind direction, and relative humidity, on an hour-by-hour basis. More details on this comparison are provided in Appendix A. Broadly, the COB data aligns with the Met Office data for most months, with small absolute differences potentially explained by data processing and quality control differences between ISD and the Met Office Integrated Data Archive System (MIDAS), or processing done by the authors of COB during TMY generation, such as the filling of missing data or smoothing data where months are joined. Two months were found to have variation beyond what could be explained by data processing (May and December) suggesting instead either a different data source, or a mismatch between the data in the COB file and the year the file records that data as having been observed. Overall, these differences were found to average out over the month, and timesteps where COB data are higher than MIDAS data are generally cancelled out within the month by timesteps where data are lower. Mean monthly temperature differences range from -0.3 to 0.1°C; windspeed from 0.3 to 0 m/s; wind direction from -4.8 to 6.2°; and relative humidity from -0.4 to 0.5%.

The treatment of missing data was also considered, by comparing values marked as NA in the MIDAS data against the COB data. The findings are summarised in Table 2. A small number of values were missing for air temperature and relative humidity in MIDAS, and these were filled in COB. For windspeed, a larger number of data were missing in MIDAS (122), 93 of which

[12] This includes by: COB authors to correct errors and out of range values (https://climate.onebuilding.org/about); the Integrated Surface Database used by COB (https://www.ncei.noaa.gov/pub/data/inventories/ish-qc.pdf); the MET Office who operate observation stations in the UK (https://weather.metoffice.gov.uk/learn-about/how-forecasts-are-made/observations/weather-stations); the European Centre for Medium-Range Weather Forecasts who publish ERA5 (https://confluence.ecmwf.int/display/CKB/ERA5) and CAMS (https://ads.atmosphere.copernicus.eu/datasets/cams-solar-radiation-timeseries).

[13] Outlier checks conducted on dry bulb temperature, windspeed, relative humidity, GHI, DHI, DNI

[14] Met Office (2025): MIDAS Open: UK hourly weather observation data, v202507. NERC EDS Centre for Environmental Data Analysis, *18 July 2025*. https://dx.doi.org/10.5285/99173f6a802147aeba430d96d2bb3099

remained as zero values in the COB data. These data span timesteps across 29th to 31st October and 12th to 15th December. According to relevant literature[15], missing values in the source data should be interpolated and it is unclear why these missing data have been assumed zero in this case. However, the TMY methodology ensures that extreme data is not selected for the TMY (ibid), and so these data are assumed to be representative enough for the purposes of calculating the energy performance of dwellings in HEM:FHS, having been selected as the most representative month from 15 years of data.

Table 2: Summary of missing MIDAS data and its treatment in COB.

Variable	# missing MIDAS	# missing COB
Air temperature	10	0
Wind speed	122	93
Relative humidity	31	0

Representative file selection methodology

The methodology for selecting the representative location for the UK was compared against three alternative methodologies. Each alternative methodology used small alterations to that documented in this paper, to understand the impact of two factors on file selection: the possibility that an extremely high rank on one variable could cancel out a low rank on another and the inclusion of windspeed in the FS ranking. These variations and the outcomes are documented in Appendix B. RAF Bedford ranked highest of three of the four methods, and fourth highest in one method.

CAMS replacement for ERA5

Since GHI is used in BS EN ISO 15927-4:2005 to select representative months, it is possible that different months would be selected as the most representative had CAMS data been used during TMY generation. Further, it is possible that the rank order of locations would change and a different location would be selected as the most representative, if CAMS-based TMY files were used for representative location selection.

To consider this issue for the RAF Bedford file, the FS statistic was calculated for each of the solar variables, by finding the absolute difference between the CDF for the daily mean in both the ERA5 and CAMS TMY files. This provides a measure of similarity between the distributions of solar data in ERA5 and CAMS. The results are shown in Table 3, where a lower value indicates greater similarity between the ERA5 and CAMS data (zero meaning no difference). The FS statistic for DNI and DHI are greater than that for GHI, demonstrating how ERA5 and CAMS are more aligned in their estimate of GHI than how GHI is divided into DHI and DHI. This is in line

[15] Huld, T., Paietta, E., Zangheri, P. and Pinedo Pascua, I., 2018. Assembling typical meteorological year data sets for building energy performance using reanalysis and satellite-based data. *Atmosphere*, *9*(2), p.53.

with academic research, which has demonstrated larger errors in ERA5 DHI and DNI than GHI, driven by uncertainties in cloud and rain properties.[16]

The GHI FS statistic is sufficiently small to provide confidence that the CAMS data is a valid alternative to the original ERA5 data in the RAF Bedford file. While the potential for different months to be selected if CAMS data were used during TMY generation remains, a low GHI FS statistic indicates greater similarity in the distribution of GHI data. This means that, if different months were found to rank highest, the GHI distribution in these months would be similar to the equivalent months in the current data.

The inclusion of temperature and humidity in the location selection process somewhat mitigates that risk that a location with different climate data would be selected as most representative. However, it is possible that a location with a similar distribution of temperature and humidity as RAF Bedford, but a different distribution of GHI, would be selected. To consider this, the FS statistics comparing ERA5 and CAMS for two other high ranked locations were calculated and are included in Table 3. These have similarly low GHI FS statistics as RAF Bedford, providing reasonable confidence that CAMS-based TMYs would not result in the selection of a representative location with large differences in GHI distribution. However, without comparing ERA5 and CAMS data for all 120 locations, some uncertainty remains, which may be addressed in future work.

Table 3: Finkelstein-Schafer statistic (FS) showing the difference between the GHI in the ERA5 and CAMS data for RAF Bedford.

Location	GHI FS	DHI FS	DNI FS
RAF Bedford	0.036	0.200	0.121
Kenley Airfield	0.077	0.200	0.148
Cranfield Airport	0.038	0.167	0.096

Future Work

In the future, we may consider direct development of TMY data from MIDAS and CAMS data. This offers several potential improvements, including improving transparency of data sourcing and processing; improving validity by including CAMS data throughout the TMY generation process; and enabling the weighting of variables in BS EN ISO 15927-4:2005 to be adjusted to suit the UK climate[17]. This would continue to enable open sourcing of weather data used in HEM:FHS.

Following from this, the representative location selection may be repeated using CAMS-based TMY files.

[16] H. Jiang, Y. Yang, Y. Bai and H. Wang, "Evaluation of the Total, Direct, and Diffuse Solar Radiations from the ERA5 Reanalysis Data in China," in IEEE Geoscience and Remote Sensing Letters, vol. 17, no. 1, pp. 47-51, Jan. 2020, doi: 10.1109/LGRS.2019.2916410.

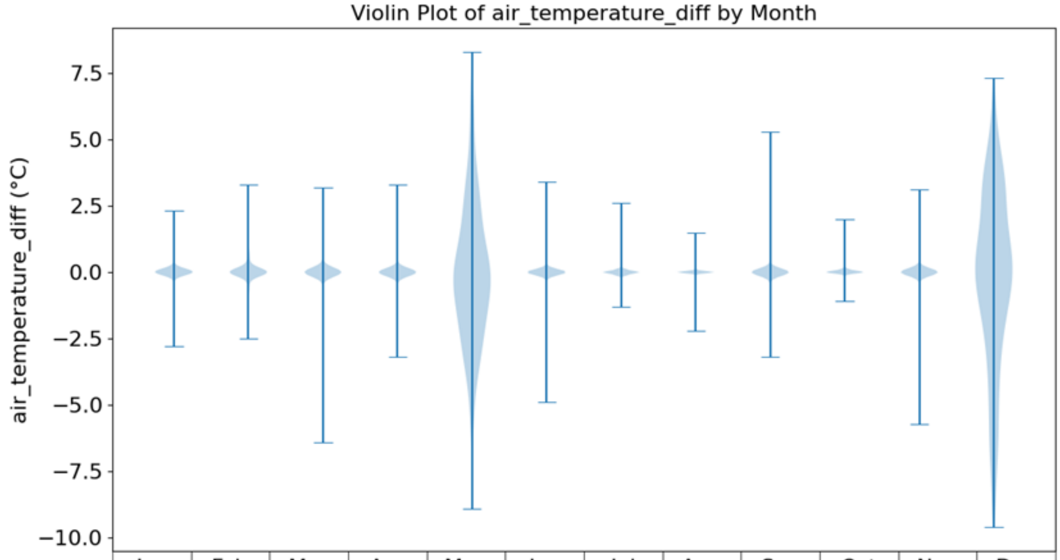
[17] For example, see: Lall, S., Rajasekar, E., Arya, D.S. and Natarajan, S., 2025. Data-driven approach to generate test reference year weather files for building energy simulations. *Journal of Building Engineering*, *111*, p.113218.

Appendix A: Hourly comparison between COB and MIDAS data

Results from the hourly comparison of COB and MIDAS data. Table 4 shows the mean hourly difference between the COB and MIDAS data for each month. Figure 1 to Figure 4 present the hourly differences as violin plots for each month and include the count of the number of timesteps matching or not matching. COB and MIDAS data are compared at 1 decimal place.

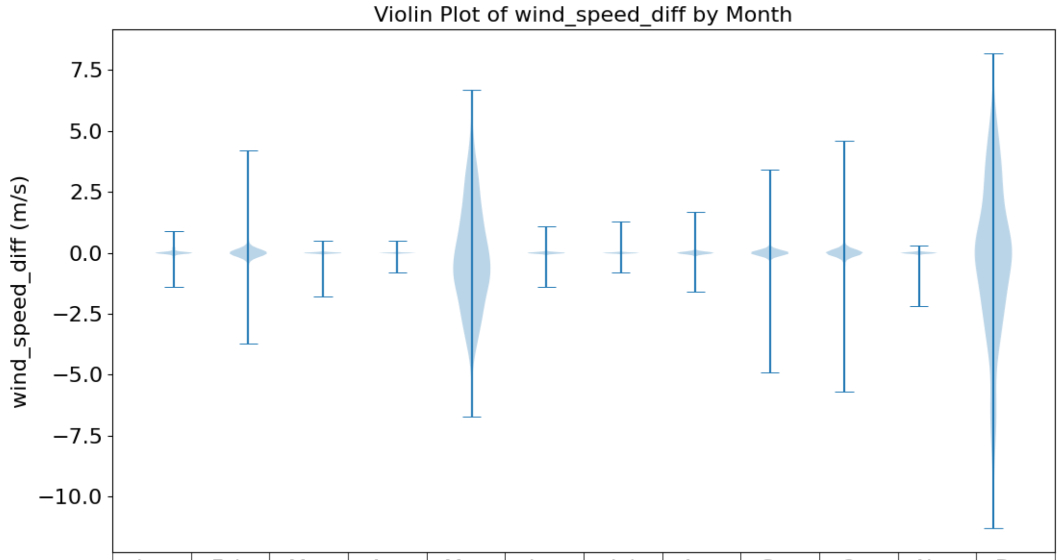
Table 4: Monthly mean of hourly differences between COB and MIDAS data. Data calculated by subtracting MIDAS data from COB data for each hour and averaging across the month. Mean includes timesteps where there is no difference.

Month	Air temperature (°C)	Wind speed (m/s)	Wind direction (°)	Relative humidity (%)
Jan	0.1	0.0	0.3	-0.2
Feb	0.0	0.0	0.6	0.3
Mar	0.1	0.0	-0.3	-0.3
Apr	0.1	0.0	0.4	0.1
May	-0.1	-0.1	-1.9	-0.4
Jun	0.0	0.0	0.8	-0.2
Jul	0.0	0.0	0.3	0.1
Aug	0.0	0.0	1.1	-0.1
Sep	0.0	0.0	-0.4	0.4
Oct	0.0	0.0	6.2	0.0
Nov	0.0	0.0	0.2	0.1
Dec	-0.3	-0.3	-4.8	0.5
min	-0.3	-0.3	-4.8	-0.4
max	0.1	0.0	6.2	0.5



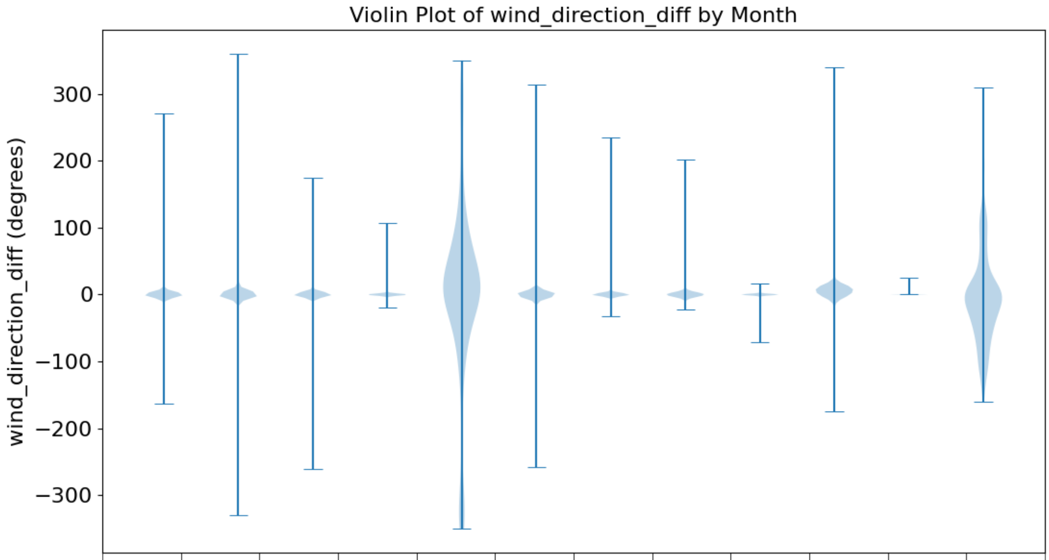
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Matching	495	301	634	375	15	689	446	688	461	583	401	13
Not-matching	249	371	110	345	729	31	298	56	259	161	319	731
Not-matching (%)	33	55	15	48	98	4	40	8	36	22	44	98

Figure 1: Comparison between hourly dry bulb temperature for COB and MIDAS data, where a positive difference indicates that COB data is greater, and negative smaller.



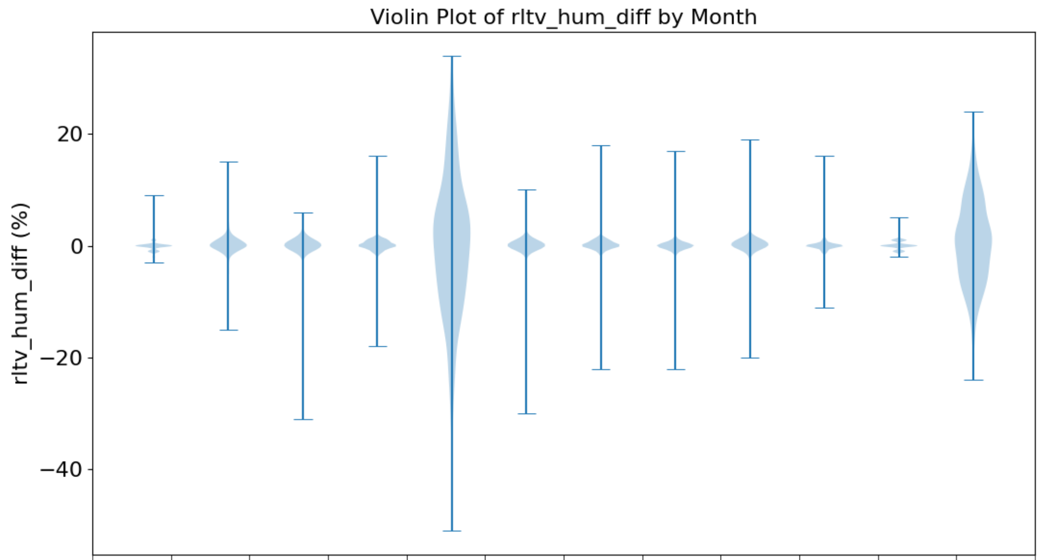
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Matching	549	560	727	709	69	694	732	668	664	539	708	94
Not-matching	195	112	17	11	675	26	12	76	56	205	12	650
Not-matching (%)	26	17	2	2	91	4	2	10	8	28	2	87

Figure 2: Comparison between hourly wind speed for COB and MIDAS data, where a positive difference indicates that COB data is greater, and negative smaller.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Matching	734	560	726	709	76	692	732	710	667	296	710	119
Not-matching	10	112	18	11	668	28	12	34	53	448	10	625
Not-matching (%)	1	17	2	2	90	4	2	5	7	60	1	84

Figure 3: Comparison between hourly wind direction for COB and MIDAS data, where a positive difference indicates that COB data is greater, and negative smaller.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Matching	487	279	488	380	21	499	464	604	356	554	400	45
Not-matching	257	393	256	340	723	221	280	140	364	190	320	699
Not-matching (%)	35	58	34	47	97	31	38	19	51	26	44	94

Figure 4: Comparison between hourly relative humidity for COB and MIDAS data, where a positive difference indicates that COB data is greater, and negative smaller.

Appendix B: Representative location selection

The representative location selection process was carried out using four methods, each with small variations to consider the impact of windspeed and the potential that a very high rank in one variable could offset for a poor rank in another. Changes for each method are described below, and the top 10 locations for each method presented in Table 5 to Table 8. Three locations ranked in the top 10 for all four methods: RAF Bedford, Kenley Airfield, and Cranfield Airport. Note that national mean windspeed against which each location is compared in Method 1 and Method 3 was calculated as 4.5 m/s.

Method 1: based on BS EN ISO 15927-4:2005 and documented in the main body of this paper.

Method 2: same as Method 1 with the following adjustment to step 5 (in bold):

> 5. For each parameter, the locations were ranked from smallest FS statistic to largest and a total rank was calculated for each location by summing **the square of** three parameter ranks.

Method 3: same as Method 1 with the addition of windspeed:

> For dry bulb temperature, global horizontal irradiance, **windspeed**, and humidity, the following steps were taken.

Method 4: combination of Method 2 (squaring the rank) and Method 3 (including windspeed).

Table 5: Top 10 ranked locations using Method 1. RAF Bedford (highlighted green) was selected as the representative location, while Kenley Airfield and Cranfield Airport were the only other two locations that appeared in the top 10 for all four methods.

Climate.onebuilding TMY location	GHI rank	Humidity rank	DBT rank	Total rank	Mean windspeed (m/s)
GBR_ENG_Church.Lawford.035440_TMYx.2009-2023.epw	22	1	15	38	2.9
GBR_ENG_RAF.Bedford.035600_TMYx.2009-2023.epw	1	39	7	47	4.2
GBR_ENG_Shobdon.AF.035200_TMYx.2009-2023.epw	29	8	13	50	2.9
GBR_ENG_Kenley.AF.037810_TMYx.2009-2023.epw	37	5	9	51	4.0
GBR_ENG_Coleshill.035350_TMYx.2009-2023.epw	51	3	8	62	3.2
GBR_ENG_RAF.Benson.036580_TMYx.2009-2023.epw	13	15	37	65	3.7
GBR_ENG_Cranfield.AP.035573_TMYx.2009-2023.epw	5	28	35	68	4.4
GBR_ENG_Holbeach.034690_TMYx.2009-2023.epw	11	51	6	68	5.4
GBR_ENG_Cosford.034145_TMYx.2009-2023.epw	64	2	5	71	3.9
GBR_ENG_RAF.Shawbury.034140_TMYx.2009-2023.epw	54	13	4	71	3.8

Table 6: Top 10 ranked locations using Method 2. RAF Beford highlighted in green.

Climate.onebuilding TMY location	GHI rank	Humidity rank	DBT rank	Total rank	Mean windspeed (m/s)
GBR_ENG_Church.Lawford.035440_TMYx.2009-2023.epw	484	1	225	710	2.9
GBR_ENG_Shobdon.AF.035200_TMYx.2009-2023.epw	841	64	169	1074	2.9
GBR_ENG_Kenley.AF.037810_TMYx.2009-2023.epw	1369	25	81	1475	4.0
GBR_ENG_RAF.Bedford.035600_TMYx.2009-2023.epw	1	1521	49	1571	4.2
GBR_ENG_RAF.Benson.036580_TMYx.2009-2023.epw	169	225	1369	1763	3.7
GBR_ENG_Cranfield.AP.035573_TMYx.2009-2023.epw	25	784	1225	2034	4.4
GBR_ENG_RAF.Scampton.033730_TMYx.2009-2023.epw	1024	400	676	2100	4.9
GBR_ENG_Leconfield.AP.033820_TMYx.2009-2023.epw	1296	289	900	2485	4.0
GBR_ENG_Doncaster.Sheffield-Hood.AP.034054_TMYx.2009-2023.epw	729	1089	784	2602	4.3
GBR_ENG_Wattisham.AF.035900_TMYx.2009-2023.epw	529	1600	484	2613	4.5

Table 7: Top 10 ranked locations using Method 3. RAF Beford highlighted in green.

Climate.onebuilding TMY location	GHI rank	Humidity rank	DBT rank	Windspeed rank	Total rank
GBR_ENG_RAF.Bedford.035600_TMYx.2009-2023.epw	1	39	7	9	56
GBR_ENG_Cranfield.AP.035573_TMYx.2009-2023.epw	5	28	35	7	75
GBR_ENG_Kenley.AF.037810_TMYx.2009-2023.epw	37	5	9	28	79
GBR_ENG_Boscombe.Down.AF.037460_TMYx.2009-2023.epw	47	4	25	6	82
GBR_ENG_RAF.Marham.034820_TMYx.2009-2023.epw	17	19	48	3	87
GBR_ENG_RAF.Lyneham.037400_TMYx.2009-2023.epw	58	23	1	8	90
GBR_ENG_London-Stansted.AP.036830_TMYx.2009-2023.epw	30	46	19	2	97
GBR_ENG_Doncaster.Sheffield-Hood.AP.034054_TMYx.2009-2023.epw	27	33	28	16	104
GBR_ENG_Wattisham.AF.035900_TMYx.2009-2023.epw	23	40	22	22	107

Table 8: Top 10 ranked locations using Method 4. RAF Beford highlighted in green.

Climate.onebuilding TMY location	GHI rank	Humidity rank	DBT rank	Windspeed rank	Total rank
GBR_ENG_RAF.Bedford.035600_TMYx.2009-2023.epw	1	1521	49	81	1652
GBR_ENG_Cranfield.AP.035573_TMYx.2009-2023.epw	25	784	1225	49	2083
GBR_ENG_Kenley.AF.037810_TMYx.2009-2023.epw	1369	25	81	784	2259
GBR_ENG_Doncaster.Sheffield-Hood.AP.034054_TMYx.2009-2023.epw	729	1089	784	256	2858
GBR_ENG_Boscombe.Down.AF.037460_TMYx.2009-2023.epw	2209	16	625	36	2886
GBR_ENG_RAF.Marham.034820_TMYx.2009-2023.epw	289	361	2304	9	2963
GBR_ENG_Wattisham.AF.035900_TMYx.2009-2023.epw	529	1600	484	484	3097
GBR_ENG_London-Stansted.AP.036830_TMYx.2009-2023.epw	900	2116	361	4	3381
GBR_ENG_RAF.Scampton.033730_TMYx.2009-2023.epw	1024	400	676	1600	3700

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