



# ORGANISATIONAL CARBON FOOTPRINT

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## Verification Report

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Taylor Wimpey plc

**Taylor**  
Wimpey

## Executive Summary

This project covers the verification of the emissions from anthropogenic sources of greenhouse gases, included within the organisation's boundary and meeting the requirements set out in ISO 14064-3: *Specification with guidance for the validation and verification of greenhouse gas assertions*.

- Organisational boundary: Taylor Wimpey UK & Europe
- Control approach: Financial Control
- Reporting period: 01/01/2022 - 31/12/2022
- GHG sources included: Scope 1 and 2 footprint of Electricity, Gas, and other on-site fuels and fuels used by vehicles owned or based within the organisational boundary and based on financial control.

Based on the work we have undertaken and the evidence provided by Taylor Wimpey plc, nothing has come to our attention that leads us to believe that the organisation's footprint has not been properly prepared, in all material respects. This is in accordance with the criteria defined in the GHG Protocol.

The total verified footprint was 20,254 tCO<sub>2</sub>e, according to the location-based method and 18,306 tCO<sub>2</sub>e, according to the market-based method. The breakdown by scope is:

- Scope 1: 15,975 tCO<sub>2</sub>e
- Scope 2 (location-based): 4,279 tCO<sub>2</sub>e
- Scope 2 (market-based): 2,331 tCO<sub>2</sub>e

During this project, the verification team identified several different recommendations that Taylor Wimpey plc should act upon. More details about these can be found under the Conclusions section of this report.



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## Project Summary

Project name	Taylor Wimpey UK Ltd – Reporting & Verification Services 2022 –
Client	Taylor Wimpey plc
Reporting criteria	GHG Protocol
Verification criteria	ISO 14064-3: Specification with guidance for the validation and verification of greenhouse gas assertions
Verification period	01/01/2022 - 31/12/2022
Level of assurance	Limited
Communication channel	Annual Report
Organisational boundary	Taylor Wimpey UK & Europe
Control approach	Financial Control
Operational boundary	Scope 1 and 2 footprint of Electricity, Gas, and other on-site fuels and fuels used by vehicles owned or based within the organisational boundary and based on financial control.
Excluded emissions (if applicable)	F-Gases



Materiality

5% materiality threshold per scope or source when reported separately

## Project Team

### Verification team

Lead Auditor

Sam Bird

Auditor(s)

Matt Randall

Peer Reviewer

Ruaridh Welsh

### Client's team

Main Contact

Anthony Lavers

Other team members

Ian Heasman, Lizzie Eyre

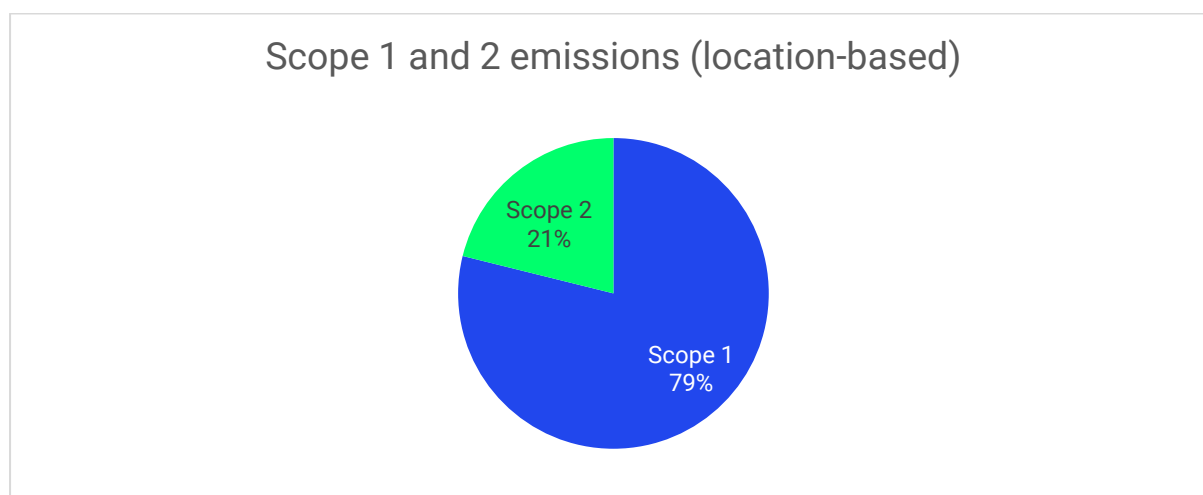
## Footprint Analysis

The total carbon footprint of Taylor Wimpey plc’s operations from 01/01/2022 - 31/12/2022 amounted to 20,254 tCO<sub>2</sub>e, according to the location-based method and 18,306 tCO<sub>2</sub>e, according to the market-based method. This footprint includes the following:

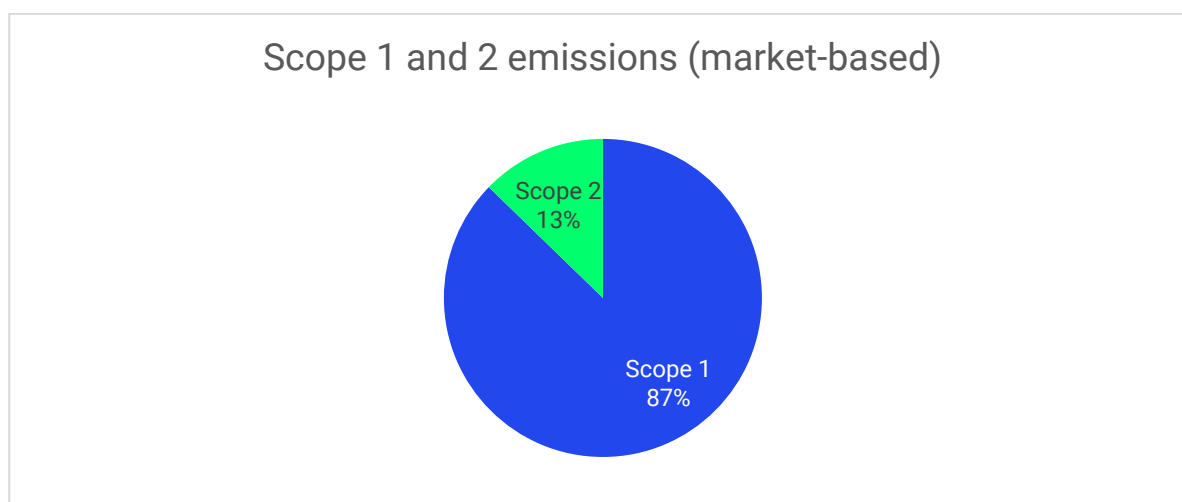
- Scope 1 and 2 footprint of Electricity, Gas, and other on-site fuels and fuels used by vehicles owned or based within the organisational boundary and based on financial control.

### Footprint breakdown

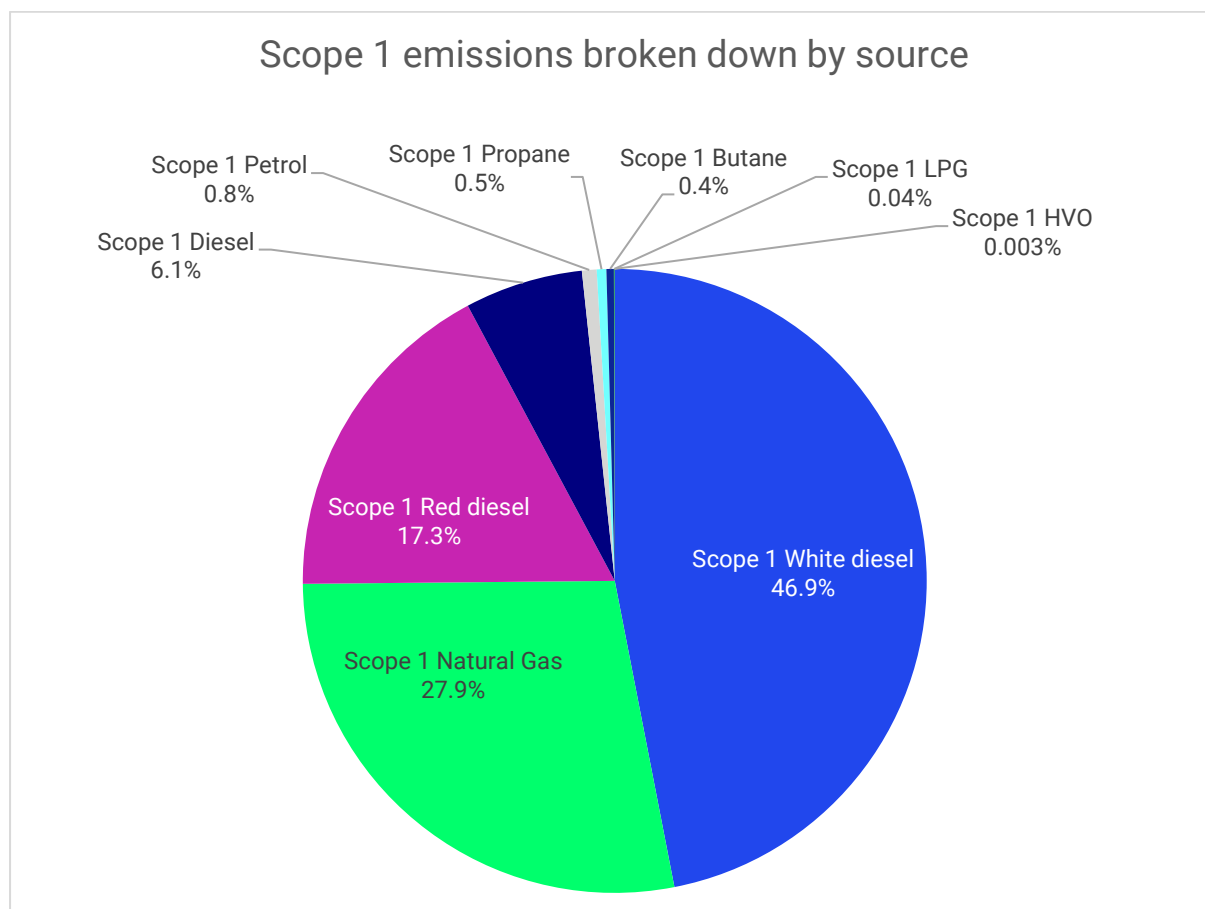
The graphs below show how the organisation’s footprint is broken down by scope and by emissions source. The only contributor to Scope 2 emissions is Electricity so no breakdown is presented.



**Figure 1. Total footprint broken down by scope (location-based).**



**Figure 2. Total footprint broken down by scope (market-based).**



**Figure 3. Scope 1 emissions, broken down by source.**

The largest part of Taylor Wimpey plc’s footprint results from Scope 1 emissions, which constitute 79% of the total footprint, according to the location-based method and 87%, according to the market-based method. Within this category, the main contributor, making up 47% of the Scope 1 footprint, is white diesel.

Scope 2 emissions amounted to 21% of the footprint, according to the location-based method, and 13% of the footprint, according to the market-based method.

### Footprint breakdown by scope and source

The graphs below show the breakdown of total footprint by scope and source. The largest contributor is white diesel (37%), followed by natural gas (22%), according to the location-based method. For the market-based method, the largest contributor is white diesel (41%), followed by natural gas (24%).

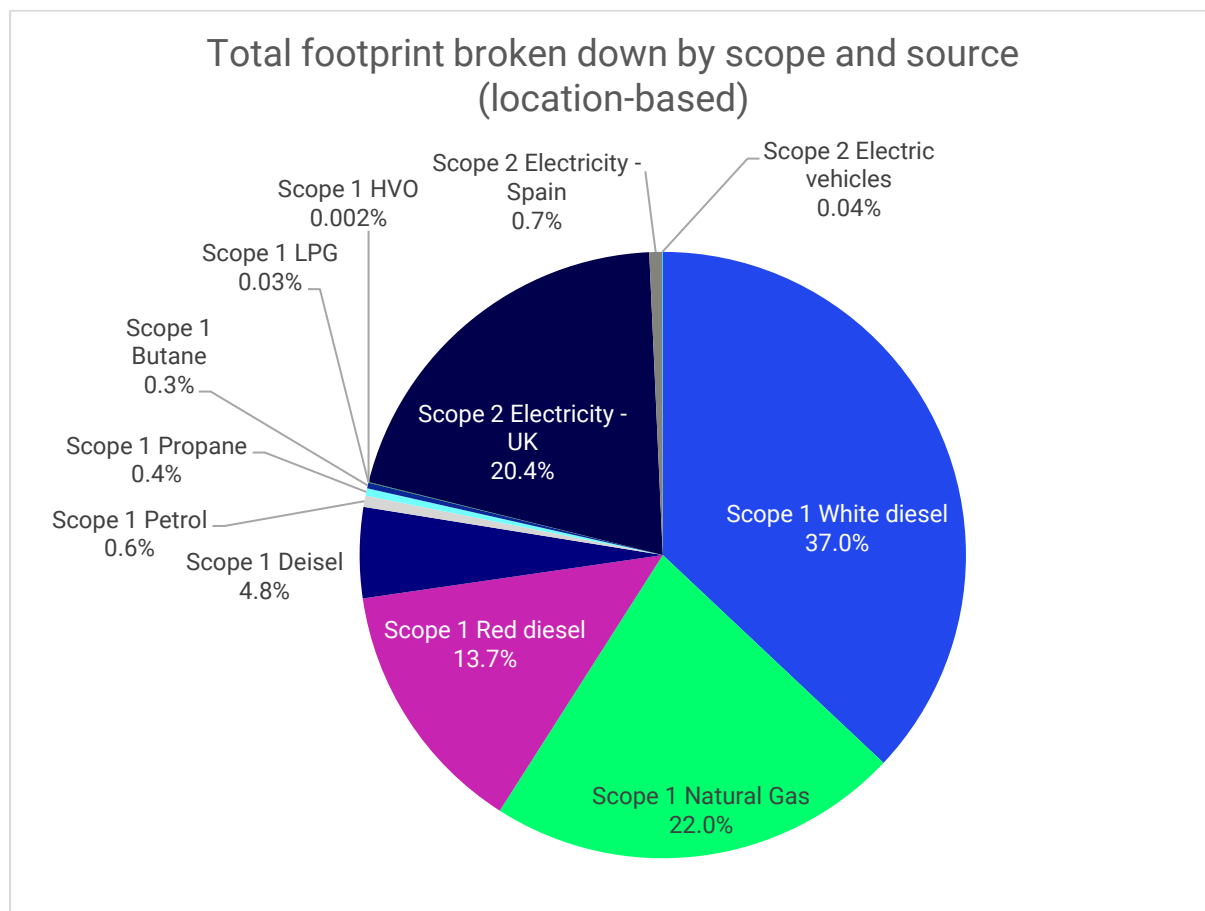


Figure 4. Total footprint, broken down by scope and source (location-based).



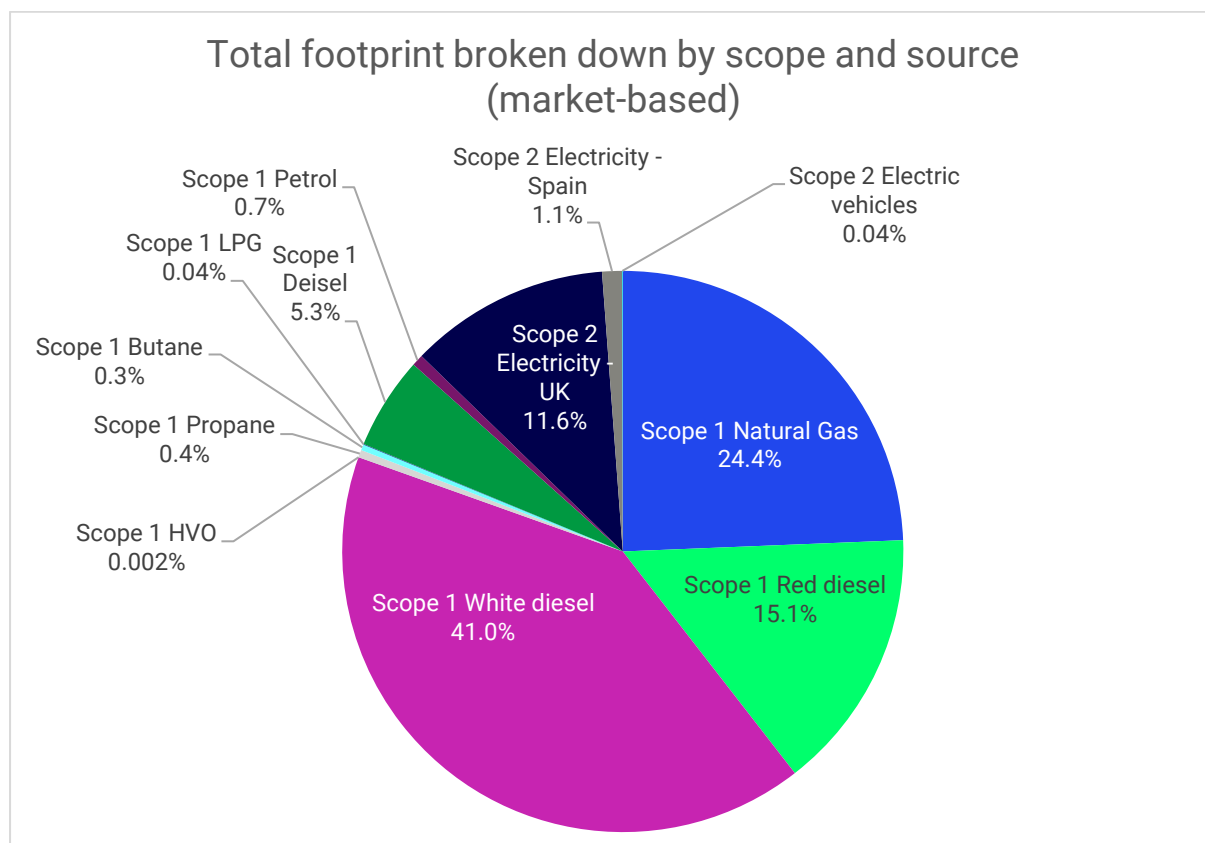


Figure 5. Total footprint, broken down by scope and source (market-based).

## Data quality analysis

An important step to calculate a verifiable footprint, is the access to data of good quality, preferably deriving from primary sources. Table 1 presents the data source, for each source of emissions.

Table 1. Data quality evaluation by emissions source

Emissions Source	Data Source	Data Quality
<b>Scope 1</b>		
<b>Premises</b>		
White diesel	Same as Butane	Good
Natural Gas	Data collection is exactly the same for gas as for electricity with site (including show homes) or office meters being collected quarterly and plot meters being assessed upon handover to either a private buyer or housing association.	Poor
Red diesel	Same as Butane	Good

Propane	Same as Butane	Good
Butane	Other Fuels consumption has for all of 2021 been tracked by AJR requesting invoices from BUs on a monthly or quarterly basis depending upon the working practices of the individual BU and inputting data onto the AJR system.	Good
LPG	Same as Butane	Good
HVO	Same as Butane	Good
<b>Vehicles</b>		
Diesel	This year we have received regular vehicle mileage reports providing mileage readings. Where we have two or more readings for a vehicle we have calculated the average daily mileage between the two readings that are closest to the extremes of the year.	Good
Petrol	This year we have received regular vehicle mileage reports providing mileage readings. Where we have two or more readings for a vehicle we have calculated the average daily mileage between the two readings that are closest to the extremes of the year.	Good
<b>Scope 2</b>		
<b>Premises</b>		
Electricity - UK	The data included is from a variety of sources with the preferred, coming via direct data collection from site. However, on occasion, access to the meter is not possible, photographs do not turn out as expected and therefore invoices are used and failing invoices being available, data gathered from supplier databases and as a last resort, estimation using prior consumption data. For unmetered street lighting supplies, all consumption is recorded from invoices or on occasion, the unmetered supply inventory.	Poor
Electricity - Spain	Invoices	Good
<b>Vehicles</b>		
Electric vehicles	This year we have received regular vehicle mileage reports providing mileage readings. Where we have two or more readings for a vehicle we have calculated the average daily mileage between the two readings that are closest to the extremes of the year.	Good

## Site Visit

Location	Shaw Valley Newbury, Taylor Wimpey Oxfordshire
Address	Woodlark Rd, Newbury, RG14 2FN
Date	03/02/2023
Auditor(s)	Matt Randall (MR), Sarah Jardine (SJ), Christina Iona (CI)
Client members interviewed	Jack Preston (JP)

### Summary of the site visit

Upon arrival at the construction site, we were directed to the site compound centre and met JP in the temporary office component of the site cabin complex. JP is the construction site manager for Shaw Valley with overall responsibility for development of houses on the site and led the tour of the construction site. There were two wall mounted HVAC units within the office. JP explained that the site compound was entirely powered via electricity connected to the grid - he showed us the location of the main electricity meter for the site compound and took a photograph as evidence which he said he will email on to us. The compound was connected to metered grid electricity (on a feed running up from the Vodafone site just down the road) quite early on when the site first started developing. In 2021, there would have been a small amount of time during which a generator was used. JP confirmed that TW metering team are informed of the installation of the electricity meter and it gets logged with AJR. JP also confirmed that AJR visit regularly throughout the year to take meter readings and photos.

In a separate cabin, we were shown a drying room for workers' clothing - the room was a windowless rectangular box with a single door, extractor fan and a wall-mounted heater. JP said that the heater was left on throughout the week to ensure clothing dried out but was turned off at weekends as most workers would take their working clothes home with them.

Further on in the site compound, we were shown two mortar silos which also are powered by the electricity supply. During peak construction activity, JP explained that the site would get through the contents of three silos every few days but in the last few months, the site progress has significantly decreased because of: 1) the colder winter months when construction takes longer due to drying times and, 2) the implementation of WIP control from TW management as a business decision to control progress on every site in line with demand for houses during the current economic climate.

JP confirmed that the only natural gas consumption occurs in the show homes and the plots before their sale; no natural gas is used on the site compound. Water heating is electric and any cooking is done via electric appliances (e.g. microwave, plug-in grill). The construction site was confirmed to close for approx 1.5 weeks over the Christmas period.

JP said that Shaw Valley was a fairly unique site in that there are no TW owned vehicles or heavy machinery - all are provided by subcontractors and the subcontractors all provide their own fuels for these. JP explained that it would have been a part of the subcontractors bid for the work that they agreed to pay for their own fuels - something that would incline TW to favour their bid as it would save them money.

JP showed us inside an unfinished plot which had not yet been connected to mains electricity or gas supplies. He explained that houses may be connected at different stages of their development as when the relevant people come to connect them to the mains, they will do 5 or 6 connections at one time. Connections tend to be in the latter phases of development just after scaffolding has been taken down, but having heating in place before dry plastering can help with the drying process. JP also explained that 95% of tools which groundworkers use on site, they will charge at home with their own electricity supply and some may bring their own generator.

JP then took us to look inside one of the three show homes that are on the site. This one had three floors, with examples of the construction methods that had been implemented on each floor (e.g. plastering, insulation etc.). MR took photos of the readings on both the electricity and gas meters on this show home. MR asked whether JP would get notified of the energy performance of the site and JP explained that he will get questioned if a meter reading is particularly high when it is taken just before the transfer of ownership of the property to the customer. If a house is not sold, it gets turned into a 'stock plot' where energy consumption is lower but cannot just be turned off completely because property won't dry out properly. Therefore, houses which have not sold for longer periods of time will generally have higher consumption reads when sold. In extreme cases of moisture build-up, de-humidifiers are used inside the plots.

JP also said that in the winter, when the drying process can take particularly long, TW will directly purchase propane and butane from Speedy Hire to use as a fuel in heaters to help accelerate the drying process. JP said that the site had used around 40-50 bottles in the last month. The Carbon Trust team noted that this was something to be checked in the

footprint because no other scope 1 fuels had been recorded against Shaw Valley during 2022. It was discussed that maybe the fuels were accounted for at group level rather than against the specific site, but this is something that should be checked.

Finally, JP explained that the electricity used in the sales office was metered through the same meters that recorded the consumption of the show homes. JP showed the Carbon Trust team the exterior of a finished plot that had not yet been sold but was stated to have been finished in Dec-21/Jan-22 so MR inferred that the metered consumption of electricity and gas from at least this time should have been recorded on the 2022 footprint so that will be checked. Photos of the readings on the electricity and gas meters at this plot were taken.

## Materiality Assessment

The verification team created a sampling plan in order to provide limited assurance for the verification. This sampling plan was based on a Risk Assessment, which evaluated each emissions source against its contribution to the footprint, the quality of the data, the data collection and monitoring processes, as well as their effectiveness.

As seen in Figure 4 above, according to the location-based method, white diesel is the largest contributor to the total footprint, constituting 37%. The next largest contributor is natural gas, which constitutes 22% of the total footprint.

As displayed in Figure 5, according to the market-based method, white diesel is the largest contributor to the total footprint, constituting 41%. The next largest contributor is natural gas, which constitutes 24% of the total footprint.

**Table 2. Risk Assessment**

Emissions Source	Value (tCO <sub>2</sub> e)	% of total footprint	Risk: High, Medium, Low
<b>Scope 1</b>			
<b>Premises</b>			
White diesel	7,498.00	41.0%	HIGH – Any errors in data collection and aggregation could lead to a material misstatement

Natural Gas	4,459.05	24.4%	HIGH – Any errors in data collection and aggregation could lead to a material misstatement
Red diesel	2,770.28	15.1%	HIGH – Any errors in data collection and aggregation could lead to a material misstatement
Propane	78.69	0.4%	LOW - misstatement will not impact the footprint in a material way
Butane	58.37	0.3%	LOW - misstatement will not impact the footprint in a material way
LPG	6.70	0.0%	LOW - misstatement will not impact the footprint in a material way
<b>Vehicles</b>			
Diesel	978.23	5.3%	MEDIUM - misstatement will not impact materiality
Petrol	121.50	0.7%	MEDIUM - misstatement will not impact materiality
<b>Scope 2</b>			
<b>Premises</b>			
Electricity - UK	2,114.64	11.6%	HIGH – Any errors in data collection and aggregation could lead to a material misstatement
Electricity - Spain	209.48	1.1%	MEDIUM - misstatement will not impact materiality
<b>Vehicles</b>			
Electric vehicles	6.68	0.0%	LOW - misstatement will not impact the footprint in a material way

The sampling plan is shown in the table below.

**Table 3. Sites included in the sampling**

Scope	Site	Emissions source(s)
Scope 1	All	White diesel
Scope 1	All	Natural Gas
Scope 1	All	Red diesel
Scope 1	All	Diesel
Scope 1	All	Petrol
Scope 1	All	Propane
Scope 1	All	Butane
Scope 1	All	LPG
Scope 1	All	HVO
Scope 2	All	Electricity - UK
Scope 2	All	Electricity - Spain



Scope 2	All	Electric vehicles
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The sampling plan remained unchanged during the verification process as a large part of the non-conformities were closed by updating the calculations according to the auditor's feedback, by presenting the requested evidence, or by presenting additional evidence to confirm the numbers reported.

## Non-conformities log

This section provides the details of all non-conformities that have been raised and closed during the verification process.

Non-conformities have been logged in accordance to two types of classification. The type of non-conformity:

- **Correction Action Requests (CAR)** when we have identified an issue with your data or analysis that needs action on your part to be corrected.
- **Clarification Requests (CL)** when we need further information to evaluate the correctness/completeness of your data and calculation.
- **Opportunity for Improvement (OFI)** when we identify an opportunity for you to improve your data collection processes or calculation, despite the fact that the one currently in play is not materially at risk of misstatement or incorrect.

And the severity of the non-conformity:

- **Minor non-conformities** are expected to have a small impact in the results of the footprint (<1% impact)
- **Major non-conformities** are expected to have a significant impact in the results of the footprint (>1% impact). All of these issues should be resolved by the end of the Verification Process.





## Correction action requests log

Reference	Scope	Emissions source	Reference file	Finding	Severity	Clarification/Action taken	Status	Date opened	Date closed
CAR 0.1	1	Butane and Propane	N/A	Propane and butane fuel purchased by Taylor Wimpey was consumed at Shaw Valley Newbury during the reporting year 2022. This has not been accounted for within the S1&2 footprint - please update the footprint to include this consumption.	Major	Jack has forwarded me some data relating to purchases of Butane and Propane on site which I have now incorporated into the data, highlighted for ease of reference in "Other Fuels - Cat A" and renamed Taylor Wimpey Carbon Analysis 2022 V3.	Closed	15/02/2023	15/02/2023

## Clarification requests log

Reference	Scope	Emissions source	Reference file	Finding	Severity	Clarification/Action taken	Status	Date opened	Date closed
CL 0.1	1	Other Fuels - Cat A (Red Diesel)	TWEL.21630-Diesel2.SPE.20220110_4.pdf	When looking through the files to check the Consumption (kWh) value, it appears the listed reference file is a duplicate of the file named "TWEL.21630-Diesel2.SPE.20220110_3.pdf", and its exclusion from the calculation gives the correct value as listed in the Consumption column. Can you confirm this file is a duplicate?	Minor	This was keyed as 2 separate lines to account for lines 1 and 2 of 1083 and 3000. These were only correctly included once each in the calculation, however when we then evidence, we have provided the evidence twice to show each line once, though I appreciate, this was unnecessary.	Closed	01/02/2023	10/02/2023
CL 0.2	1	Other Fuels - Cat A (Red Diesel)	TWSE.21139-Diesel2.CE.20220708	When checking the quantity value on the reference file for the site this consumption value refers to, the invoice explicitly states the purchased fuel to be "Diesel Offroad (White)" though these evidence requests pertain to Red Diesel. Is there an explicit reason for this?	Minor	This is incorrectly labelled as Red Diesel and should have been reported as White Diesel	Closed	01/02/2023	10/02/2023
CL 0.3	1	Other Fuels - Cat A (White Diesel)	Taylor Wimpey Carbon Analysis 2022 Q1 to Q3	On the "Brunton Rise" Q3 consumption value for "Other Fuels - Cat A (White Diesel)", compared to the quantity data tallied from the invoices, there is a 2% variance between the values (289,011.70 kWh compared to 283,692.22 kWh). Do you know why this is?	Minor	We show the data to match exactly. Reported consumption in litres is 27116 which matches the invoices provided.	Closed	01/02/2023	10/02/2023
CL 0.4	1	Other Fuels - Cat A (Butane)	Taylor Wimpey Carbon Analysis 2022 Q1 to Q3	On the "Limebrook Rise Infrastructure" Q1 consumption value for "Other Fuels - Cat A (Butane)", compared to the quantity data tallied from the invoices (62 compared to 58), there is a 7% variance between the values (12,684.30 kWh compared to 11,865.96). Do you know why this is?	Minor	Reported figures show 62 bottles which matches the invoice	Closed	01/02/2023	10/02/2023
CL 0.5	1	Other Fuels - Cat A (LPG)	Taylor Wimpey Carbon Analysis 2022 Q1 to Q3	On the "The Lees Phase 1" Q1 consumption value for "Other Fuels - Cat A (LPG)", the method states that the photo reading of 1341 taken on 26/08/2021 was one of the values used for the calculation. However, looking at the image attached for that date, the value is not 1341 but is 1347. Do you know if someone has accidentally put 1341 whilst inputting the data, or was the incorrect value used as part of the calculation?	Minor	This was a mistake in the data entry. The reading of 1341 was used as part of the calculation. This means Q1 was underreported by 3m3	Closed	01/02/2023	10/02/2023
CL 0.6	1	Natural Gas - Cat A&B	Taylor Wimpey Carbon Analysis 2022 Q1 to Q3	The calorific value being used in conversion from m3 to kWh for natural gas is 39.4 MJ per m3. What source was this calorific value selected from?	Minor	This is a calorific value is an average arrived at by averaging National Figures for a 12 month period provided by National Grid	Closed	01/02/2023	16/02/2023



CL 0.7	1	Natural Gas - Cat A	Taylor Wimpey Carbon Analysis 2022 Q1 to Q3	For ER 1.0, why was there a need to extrapolate to the origin of the meter opening date to calculate an estimate of consumption on 31/12/2022? Would it not have been more accurate to use the actual reads taken at 20/09/2021 and 11/01/2022 and calculate an average daily consumption during this timeframe to arrive at a estimated reading for 31/12/2021?	Minor	<p>ER1.0 shows as a CAT B handover which includes no extrapolation, is this incorrectly labelled?  <b>Sorry, this was meant to be referring to ER 0.1 - please could you answer the query in relation to ER0.1?</b></p> <p>The quarter end reads are initially calculated at the earliest possible date after quarter end. This means at the time the read was calculated the only data available was 1 photo and supplier estimated readings. We therefore calculated the reading in the described manner.</p> <p>A photo was then obtained but as the data wasn't showing to be highly egregious it wasn't identified for recalculation. Due to the reporting being quarterly, we must calculate the readings on a quarterly basis, if we were to recalculate the consumption based on the latest data every quarter, it would result in all the data changing and nullifying all previous reporting.</p>	Closed	01/02/2023	16/02/2023
CL 0.8	N/A	All	Taylor Wimpey Carbon Analysis 2022 Q1 to Q3	If you were to extrapolate to get a consumption estimate for the end of a quarter and this proves to be an over-estimate due to the value of the next actual meter read in the following quarter being lower than your extrapolated figure for the original quarter-end, could you explain how the estimate is amended and at what stage this is implemented?	Minor	<p>If the supply is now showing "clocked" this would appear in reporting, we would then review the evidence and recalculate the quarter end reads as needed.</p> <p>Alternatively, if the supply is simply now showing a large consumption spike in the latest quarter, we would recalculate consumption back as needed to flatten the usage (this would only usually be within the reporting year), this would be to provide better analysis on the consumption as ultimately the total usage over 12 months would be the same.</p> <p>Both of these happen during the quarter end data validation stage, however the former also can take place throughout the quarter as new data is entered.</p>	Closed	01/02/2023	10/02/2023
CL 0.9	1	Natural Gas - Cat B	Taylor Wimpey Carbon Analysis 2022 Q1 to Q3	For ER 0.7 to ER 1.2, are all meters set to start at 0 m3 such the transfer read will always be equivalent to the value of consumption?	Minor	<p>Correct, almost all gas meters are installed on a reading of zero. It is always assumed this to be the case other than very specific known cases with some very old (Pre 2010 meters) and a few select 2019 meters. At this point if a non-zero is assumed it is queried with the supplier for confirmation and to obtain the true install data.</p>	Closed	01/02/2023	10/02/2023
CL 1.0	1	Natural Gas - Cat B		For ER 0.7 to ER 1.2, is there any evidence of the handover meter readings beyond it being included in an email (i.e., was it recorded in a photo or by a final invoice)?	Major	<p>The handover data is recorded on the day by the site, the data is entered in to TW systems which then automatically sends us an extract via email.</p> <p>Photos are rarely taken of the supplies. Invoicing for these supplies, if available, is via spreadsheet.</p>	Closed	01/02/2023	17/02/2023

CL 1.1	1	Natural Gas - Cat B	Taylor Wimpey Carbon Analysis 2022 Q1 to Q3	Do you have evidence available for ER 0.3?	Major	This office is not metered and direct reporting is unavailable. However, as per the methodology, "... We have assumed for the purposes of this assessment that all offices being estimated have both gas and electricity supplies and in order to estimate the consumption we have used the quarterly consumption in 2022 for the offices that have metered gas and electricity supplies. For each quarter, we worked out an average kWh/ft2 value for gas and electricity individually taking account of the total gas or electricity consumption across these offices and dividing these totals by the combined ft2 of the same offices. TW Logistics has been excluded from this calculation as their new premises, incorporating substantial warehouse space, massively skews the values and is a very different type of premises than all of the other purely office environments. We have then applied this kWh/ft2 to the unmetered offices by multiplying the ft2 of each unmetered office by the kWh/ft2 and applying the resulting value as gas or electricity consumption for that office. This has been added to the main raw data and factored into all subsequent totals."	Closed	01/02/2023	14/02/2023
CL 1.2	2	Electricity - Cat A	Taylor Wimpey Carbon Analysis 2022 Q1 to Q3	The consumption value being sampled in ER 1.4 is 0 kWh as per the carbon analysis file. However, from the evidence provided and the methodology described, I get a calculated consumption value for Q1 as 25,123 kWh. Can you explain this discrepancy?	Major	During Q4, a photo was taken of this supply in validating the reported data. This has reflected in the Q4 data submission, but did show this calculated required major changes to correct previous calculations.	Closed	01/02/2023	10/02/2023
CL 1.3	2	Electricity - Cat A	Taylor Wimpey Carbon Analysis 2022 Q1 to Q3	The consumption value being sampled in ER 1.4 is 1306 kWh as per the carbon analysis file. However, from the evidence provided and the methodology described, I get a calculated consumption value for Q2 as 25,406 kWh. Can you explain this discrepancy?	Minor	During Q4, a photo was taken of this supply in validating the reported data. This has reflected in the Q4 data submission, but did show this calculated required major changes to correct previous calculations.	Closed	01/02/2023	10/02/2023
CL 1.4	2	Electricity - Cat A	Taylor Wimpey Carbon Analysis 2022 Q1 to Q3	Adding up the invoice consumption values for July, Aug and Sep 2022, I get a Q3 consumption value of 86,354 kWh rather than the value of 82,538 kWh stated in the carbon analysis file. Can you explain this 4% variance?	Minor	During Q4, the invoice data for this supply was received. The reported consumption was shown to be incorrect and has been reflected through in Q4 reporting.	Closed	01/02/2023	10/02/2023
CL 1.5	2	Electricity - Cat B	Taylor Wimpey Carbon Analysis 2022 Q1 to Q3	For ER 2.1 to 2.3, are all meters set to start at 0 kWh such the transfer read will always be equivalent to the value of consumption?	Minor	Correct, the vast majority of electric meters are new meters meaning zero start read. There are non-zero meters but these are usually at least 30 months old and obvious through the reported final figure. In those cases we would attempt to get true install data from the meter tags (if available), the supplier (if available), or failing this, the reading would be estimated based on known data.	Closed	01/02/2023	10/02/2023
CL 1.6	2	Electricity - Cat B	Taylor Wimpey Carbon Analysis 2022 Q1 to Q3	For ER 2.1 to 2.3, is there any evidence of the handover meter readings beyond it being included in an email or Excel file (i.e., was it recorded in a photo or by a final invoice)?	Major	The handover data is recorded on the day by the site, the data is entered in to TW systems which then automatically sends us an extract via email. Some completions are done via third party which are provided back via excel form or similar. Photos are rarely taken of the supplies. Invoicing for these supplies, if available, is via spreadsheet.	Closed	01/02/2023	17/02/2023
CL 1.7	2	Electricity - Cat B	Taylor Wimpey Carbon Analysis 2022 Q1 to Q3	For ER 2.6, comparing the meter readings at 31/12/2021 and at 31/03/2022, I get a total consumption value for Q1 of 16,356 kWh rather than the reported 21,585 kWh. Can you explain this 32% variance?	Minor	This data is provided directly from the Spain office, however due to a format change, the initial data required correction to reflect a true reading provided which was initially unavailable. This caused a consumption recalculation.	Closed	01/02/2023	10/02/2023



CL 1.8	1	Butane and Propane	N/A	<p>We visited the site "Shaw Valley Newbury", and the site manager explained that during the cold, winter months, to help accelerate the internal drying process of new homes, TW purchase propane and butane from Speedy Hire to burn in heaters inside the plots. The site manager estimated that around 40-50 bottles of butane/propane had been used on the site in the last few months for this purpose. There is no record of 'other fuels' consumption at Shaw Valley Newbury within the carbon analysis file - do you know why this would be? Could the propane/butane consumption have been combined with the values from another site?</p>	Major	<p>Direct invoicing is used to record and then evidence, the Other Fuels data. It is reported at the either the reported site code or the reported site address. It is common with multi-phase sites to not update the accounts with the supplier and use the initial site coding. That being said, in this case, I suspect it is due to the provision of the butane is not being through Taylor Wimpey and instead directly obtained via groundworkers. We are querying this with both the division and site to understand the source of your data.</p> <p><b>UPDATE 15/02/23:</b> We've queried with the division and had a response this morning that they had missed it. Apparently, the buyers coded the fuels under the wrong data so finance couldn't see they had it (they had confirmed previously all was sent). They are adamant this hasn't impacted any other site as they've checked the coding used and nothing else appears.</p> <p>We've now gotten the missed data keyed and I've dropped a summary below.</p> <p>Secondary Description Quantity                  Butane (15kg Cylinder) = 61                  Propane (19kg Cylinder) = 10                  Butane (13kg Cylinder) = 4</p> <p>To give further context, we have a checklist on our site visit app which covers, amongst a number of things, what other fuels are being purchased by site such that we can cross reference invoice receipts from the divisions. Our checklist do not indicate we have been told that Butane / Propane are being purchased on site and it has not therefore been flagged as a concern. We obviously cannot know when a purchase has been incorrectly coded at a division.</p>	Closed	08/02/2023	16/02/2023
CL 1.9	1 & 2	Natural gas and electricity	N/A	<p>During our site visit to "Shaw Valley Newbury", we were shown a plot where the house was finished but not yet sold to a buyer. The site manager explained that this particular plot was finished approximately Dec-21/Jan-22 and had been using metered gas and electricity since then. The gas serial number (E6S21216732061) and the electricity serial number (21L3842819) for this plot do not exist in the Carbon Analysis file and presumably, they will only appear and the consumption will only be included once the property is purchased and readings are taken on transfer date. Is this correct, and are there any plans to account for plots which have a longer time between completion and sale on an ongoing basis rather than just recording all consumption upon the sale date?</p>	Major	<p>As per methodology, plot supplies are only reported within the quarter that it legally completes. Again, as per the methodology, there is no intent to read meters in any other manner as it was decided it is totally impractical to obtain quarterly meter readings for all plots given the volumes. Also, given there is always a similar number of stock plots, we have a consistent year on year approach.</p>	Closed	08/02/2023	13/02/2023



CL 2.0	2	Electricity	Harmony 2 - Building Site - Fenie Energia - 20221005.pdf	Please could you explain how the invoice provided has been used to extract the meter readings of 41814 on 05/10/2022 and 30727 on 31/08/2022? I can see that the invoice covers this data period but am struggling to figure out how these meter readings were pulled out of the information on the invoice.	Minor	Spanish meters read are similar to multirate meters, however they are split in to 6 periods. This particular invoice wants to reference page 2, then the section at the top labelled "Active (kWh)". Lectura Actual (Current Read) and Lectura Anterior (Previous Read), give current and previous reads. Sum each value to get a single unit rate which we then record. See sheet CL2.0 for snip.	Closed	08/02/2023	13/02/2023
CL 2.1	2	Electricity	All	Please can you provide REGO certificates for all supplier contracts where market-based emissions have been calculated as zero due to a supply being a 100% renewable tariff?	Major	<p>With regard to REGO, please refer to the "market based scope 2 2022" tab in the carbon model for the weblinks for EON.</p> <p>For British Gas, as with last year, please find attached a copy of the metering agreement and refer to Clause 3.3. Please once again note the commercial sensitivity of this document.</p> <p>For Npower, as with previous years, we have provided a confirmation from our account manager that all TW contracts with Npower are covered by REGO. Historically, Npower have had no mechanism to provide certificates. However, they now do going forward so within the email from Npower, they have provided the certification for the latest contract renewals and although these fall outside of the period, these will form part of a more robust evidence available from Npower going forward.</p> <p>The last 12 months within the energy market have been about survival, with unprecedented pricing levels and suppliers completely disengaging from the acquisition market. We had no options to move supplier during the last 12 months and EON / Npower were still going through elements of their system transformation.</p> <p>We have taken steps during this year to tie all supply contracts to a couple of common end dates which has simplified the job of providing this information going forward which was what I provided for this year.</p>	Closed	06/02/2023	14/02/2023



## Opportunities for improvement log

Reference	Scope	Emissions source	Reference file	Finding	Severity	Clarification/Action taken	Status	Date opened	Date closed
OFI 0.1	1 & 2	Electricity & Gas	N/A	To reduce the proportion of estimated data within the footprint, consider connecting all TW offices which are currently unmetered to metered electricity and gas supplies such that consumption at each office can be more accurately monitored and recorded.	Minor		Open	17/02/2023	
OFI 0.2	1 & 2	Electricity & Gas	N/A	The evidence that has been provided to corroborate the category B electricity and gas consumption (i.e. consumption that occurs at plots between connection to the grid and house transfer of ownership) needs to be improved. The consumption entered into TW's reporting is dependent on the process of a sales executive taking a reading and emailing the reading for record. This process is liable to human error. The evidence is deemed permissible this year as we have seen limited supporting supplier documentation to help corroborate the sample meter readings and, in last year's verification, meter reading photographs were provided for equivalent evidence requests as further evidence. This implies a base level of confidence in the reporting process but, for the next verification, Taylor Wimpey needs to ensure that suitable evidence, for example photographs of meter readings, are available – in the absence of such evidence it may not be possible to successfully complete the verification process next time.	Major		Open	17/02/2023	
OFI 0.3	1 & 2	Electricity and Gas	N/A	Due to the nature of manual data input, even when good evidence is available, there is always a risk that data can be input incorrectly into the system due to human error. Increasing the proportion of AMRs within TW's portfolio would help to reduce data entry error and would also improve accuracy of reporting by reducing need for extrapolation of consumption values to meet quarter-end reporting timeframes.	Minor		Open	17/02/2023	
OFI 0.4	1	Gas	N/A	When calorific values are provided by suppliers, these should be used to calculate kWh rather than using a National Grid average. Supplier specific calorific values will generate a more accurate calculation of TW's footprint based on the actual composition of gas being used.	Minor		Open	17/02/2023	
OFI 0.5	2	Electricity	N/A	The renewable tariff evidence has been deemed acceptable for the purposes of this verification. However, TW should seek to obtain better evidence of the exact electricity tariffs they are on with each of their suppliers and confirmation of the dates through which their tariff contract is valid. REGO certificates are the ideal evidence to provide for this but in their absence, the provision of evidence, explicitly explaining which TW sites are on the tariff, the time period during which they are on this tariff and details about the tariffs are necessary for future verifications.	Major		Open	17/02/2023	
OFI 0.6	1	F-gases	N/A	F-gas leakages have been estimated using a continuous leakage rate and deemed immaterial and therefore excluded from the footprint being verified. F-gases could be better monitored by incorporating maintenance logs into the reporting process, documenting any discrete leaks. Or, alternatively, to have complete confidence in excluding f-gases on the basis of materiality, an assessment of the total possible impact from f-gases could be conducted by assessing what the total CO2e mass contribution could be to the footprint if all f-gases stored in cooling/refrigeration systems were released at once.	Minor		Open	17/02/2023	





OFI 0.7	1	N/A	<p>TW should consider improving the recording of fleet emissions data by considering transitioning to processes that record actual fuel consumption/mileage. Ideally TW would use fuel cards to track consumption of their vehicles but it is noted that this is unlikely to occur at the moment so regular servicing of vehicles allowing regular of vehicle mileage should be continued to get more accurate figures for mileage than using contracted mileage figure. TW should also consider staff engagement initiatives to increase confidence in knowledge of the proportion of fuel being used for business versus personal travel.</p>	Minor		Open	17/02/2023
OFI 0.8	1	N/A	<p>As a result of the site visit to Shaw Valley Newbury, it was discovered that butane and propane were being purchased and burnt on site by TW but these fuels were not being reported in the footprint due an error in logging the fuels purchased. TW should make sure that all staff are aware of how to record fuel purchases at each site such that AJR have full visibility of what is being used and can ensure that there are no omissions from the footprint which could lead to material misstatement.</p>	Major		Open	17/02/2023
OFI 0.9	1&2	N/A	<p>Taylor Wimpey should consider having members of each site team take photos of the plot electricity and gas meter readings at the end of each quarter such that consumption can be tracked throughout the year rather than just upon handover. The current process means that all consumption of a plot gets allocated to the date on which the handover of ownership occurred, which may not always be reflective of the reporting year in which most of the consumption actually occurred. It is noted the huge number of plots makes this process difficult and there is a consistent process to capture data each year but ensuring data is reported to the correct year would help to document changes in consumption when they actually occurred and enable greater visibility on the reaction of TW's footprint to different influencing factors.</p>	Major		Open	17/02/2023

## Conclusions

Based on the work undertaken and the evidence provided by Taylor Wimpey plc, it was confirmed with Limited Assurance that nothing has come to our attention that leads us to believe that the organisation's CO<sub>2</sub>e emissions have not been properly prepared, in all material respects, in accordance with the criteria defined in the GHG Protocol.

- Scope 1: 15,975 tCO<sub>2</sub>e
- Scope 2 (location-based): 4,279 tCO<sub>2</sub>e
- Scope 2 (market-based): 2,331 tCO<sub>2</sub>e

## Recommendations

The following key recommendations have been identified from the Opportunities for Improvement listed above and the interview. These should be acted upon and/or resolved by the time of the next GHG emissions verification audit.

Reference	Scope	Recommendation
R1	1 & 2	The evidence that has been provided to corroborate the category B electricity and gas consumption (i.e. consumption that occurs at plots between connection to the grid and house transfer of ownership) needs to be improved. The consumption entered into TW's reporting is dependent on the process of a sales executive taking a reading and emailing the reading for record. This process is liable to human error. The evidence is deemed permissible this year as we have seen limited supporting supplier documentation to help corroborate the sample meter readings and, in last year's verification, meter reading photographs were provided for equivalent evidence requests as further evidence. This implies a base level of confidence in the reporting process but, for the next verification, Taylor Wimpey needs to ensure that suitable evidence, for example photographs of meter readings, are available – in the absence of such evidence it may not be possible to successfully complete the verification process next time.
R2	2	The renewable tariff evidence has been deemed acceptable for the purposes of this verification. However, TW should seek to obtain better evidence of the exact electricity tariffs they are on with each of their suppliers and confirmation of the dates through which their tariff contract is valid. REGO certificates are the ideal evidence to provide for this but in their absence, the provision of evidence, explicitly explaining which TW sites are on the tariff, the time period during which they are on this tariff and details about the tariffs should be provided for future verifications.



R3	1	As a result of the site visit to Shaw Valley Newbury, it was discovered that butane and propane were being purchased and burnt on site by TW but these fuels were not being reported in the footprint due an error in logging the fuels purchased. TW should make sure that all staff are aware of how to record fuel purchases at each site such that AJR have full visibility of what is being used and can ensure that there are no omissions from the footprint which could lead to material misstatement.
R4	1 & 2	Taylor Wimpey should consider having members of each site team take photos of the plot electricity and gas meter readings at the end of each quarter such that consumption can be tracked throughout the year rather than just upon handover. The current process means that all consumption of a plot gets allocated to the date on which the handover of ownership occurred, which may not always be reflective of the reporting year in which most of the consumption actually occurred. It is noted the huge number of plots makes this process difficult and there is a consistent process to capture data each year but ensuring data is reported to the correct year would help to document changes in consumption as and when they actually occurred and enable greater visibility on the reaction of TW's footprint to different influencing factors.
R5	1 & 2	Central London is considered within the Taylor Wimpey plc Group organisational boundary due to the merger between the Central London and London business units during 2021. As previously recommended, now that Taylor Wimpey Plc has financial control over these sites Central London legacy and join-venture sites, they should contact the principal contractors for these sites to gather this information for the 2023 footprint.

Although Taylor Wimpey plc should aim to act upon all recommendations ahead of following verifications, in order to obtain verification next year, R1 will need to be addressed.