ESOS Compliance Strategy

Taylor Wimpey PLC

STATUS: FINAL v1-0

30 November 2015

ESOS Compliance Strategy

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NOTE
Unless otherwise stated, the energy consumption data contained in this report relates to the chosen ESOS 12 month reference period 01 January 2014 – 31 December 2014

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2. Taylor Wimpey's ESOS qualification
3. Scope of participation
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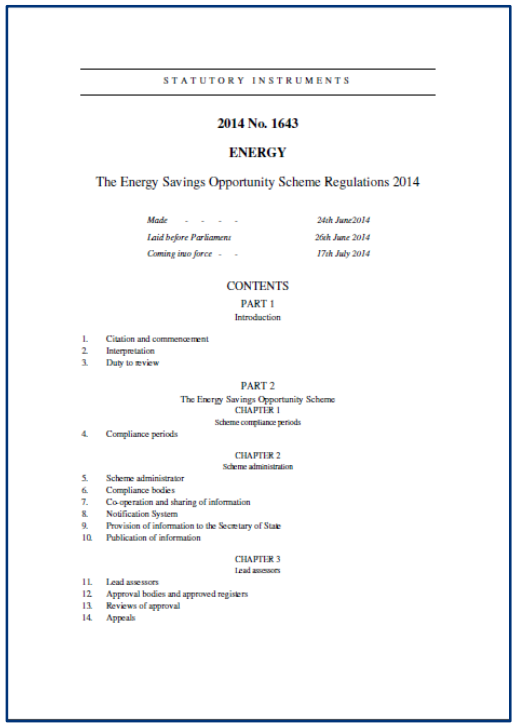
Energy Savings Opportunity Scheme (ESOS)

- UK Government's approach to implementing Article 8 of the EU Energy Efficiency Directive
- Came into force on 17th July 2014 (laid before Parliament 26th June 2014)



STATUTORY INSTRUMENTS

2014 No. 1643

ENERGY

The Energy Savings Opportunity Scheme Regulations 2014

Made - - - - 24th June 2014
Laid before Parliament 26th June 2014
Coming into force - - 17th July 2014

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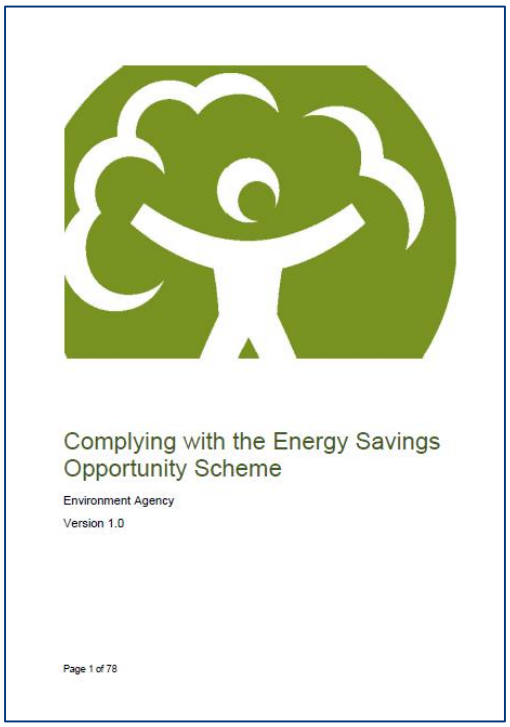

Complying with the Energy Savings Opportunity Scheme

Environment Agency

Version 1.0

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What does ESOS require?

What

- Energy assessment for a 12 month period overlapping the qualification date: 31st December 2014
- All UK energy consumption: buildings, transport, and industrial processes; verified to primary data

Who

- 'Large undertakings': 250+ employees or €50m t/o and an annual balance sheet of €43m
- Excludes organisations subject to the Public Contracts Regulations 2006. SMEs and the Public sector are not required to participate

How

- Measure all energy consumption & determine areas of significant energy use (90% spend/use)
- Identify saving opportunities. Routes to compliance: energy audits, ISO50001, DECs or GDAs
- Appoint an accredited Lead Assessor; have a company Director sign-off; report compliance to EA

When

- Qualification date: 31st December 2014
- Four year compliance phase: December 2011 - 2015. Compliance date 5th December 2015
- Followed by two further four year phases

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Basis of ESOS participation

- Taylor Wimpey is required to comply with ESOS on the basis of all of the stated qualification criteria on the qualification date of 31 December 2014

- **250+ employees** 

- **€50 million turnover and €43 million balance sheet** 

- Source: Taylor Wimpey Annual Report and Accounts 2014

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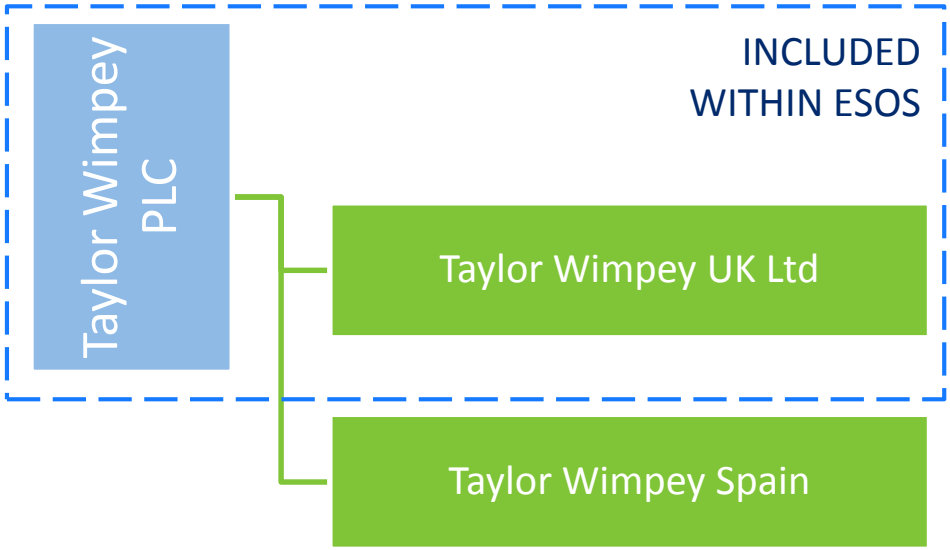
Structure of Taylor Wimpey PLC

- Taylor Wimpey PLC is a company registered in England and Wales with company number 296805 and its registered office is at Gate House, Turnpike Road, High Wycombe, Buckinghamshire, HP12 3NR
- The corporate structure of Taylor Wimpey PLC consists of Taylor Wimpey UK Limited and a small operation in Spain, as illustrated below. Only Taylor Wimpey UK's operations fall within the scope of ESOS.



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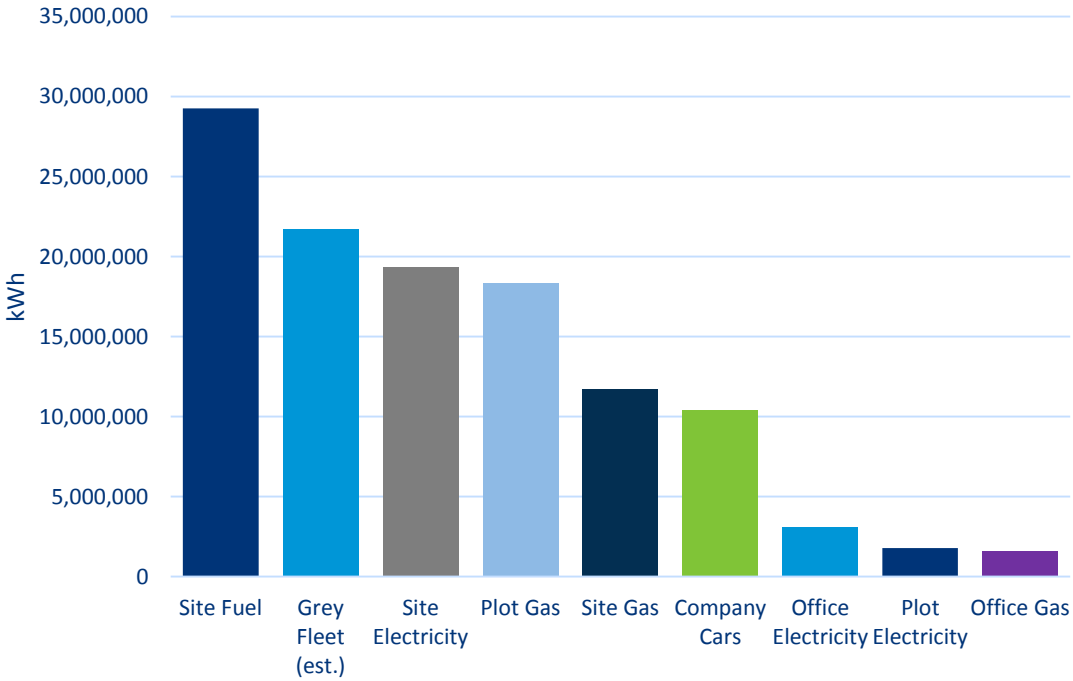
Data and information sources

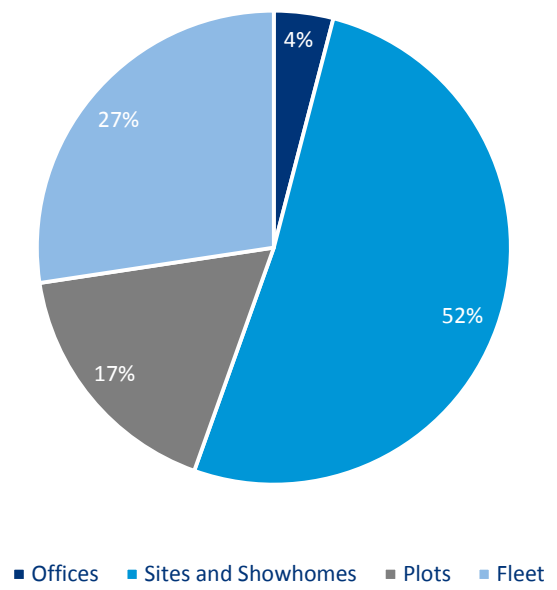
- Taylor Wimpey has chosen their ESOS reference period as 01 January 2014 to 31 December 2014
- The energy cost and consumption data used to determine the total energy consumption of Taylor Wimpey during their reference period was provided by Ian Heasman and David Grant
- The data provided was based upon a carbon analysis carried out for Taylor Wimpey's 2014 carbon reporting
- Additional information was provided from metered gas and electricity information from individual sites as collected by AJR Management
- The key information and data sources used in the preparation of this report are detailed below:
  - 'MCR report 2014 v2 final 150202' – Central summary document of all company energy consumption for the year 2014. Basis of 2014 carbon reporting.
  - 'Carbon Trust Sites' – Spreadsheet provided by AJR Management of energy consumption for individual sites to be audited
  - 'Q2 2014 2015 Compound Comparisons' – Data provided by Taylor Wimpey to identify sites that qualify for ESOS

Company Overview – Energy Profile

Total Annual Energy Consumption by Source

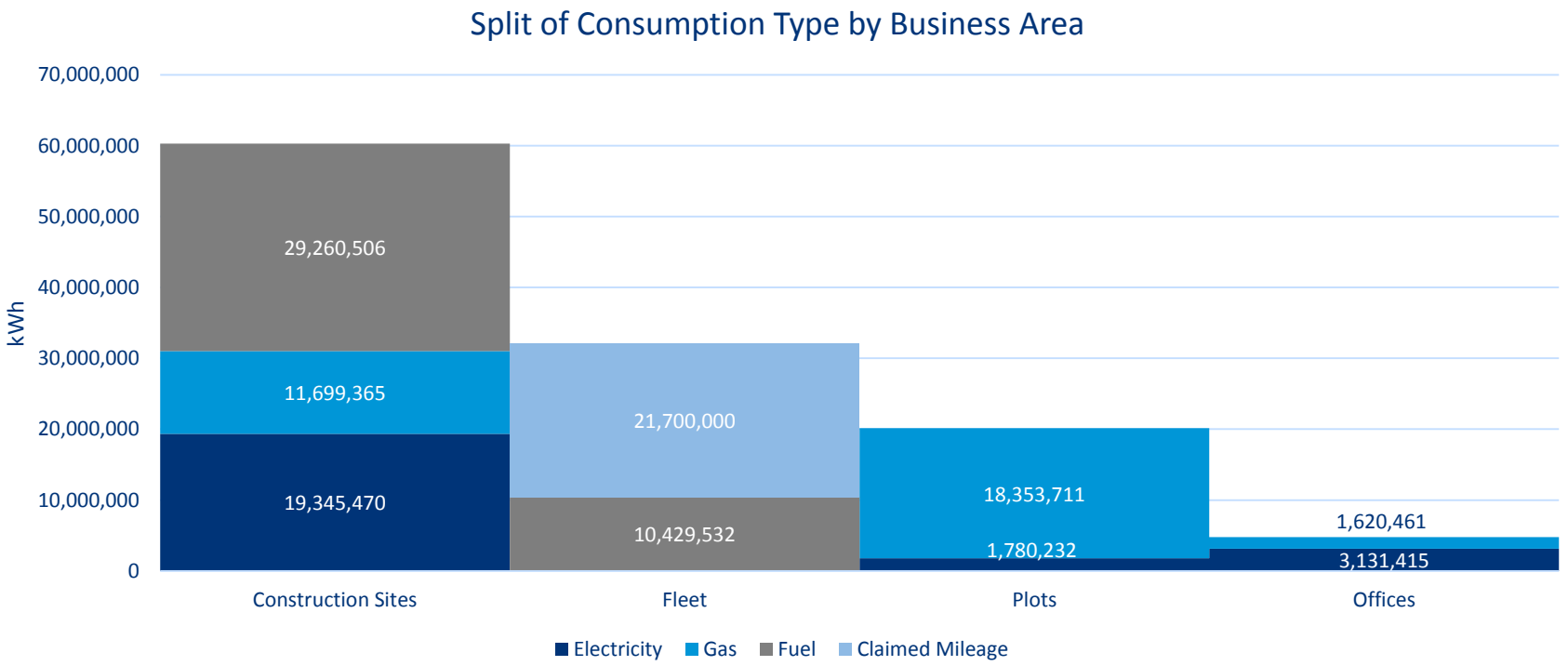


Total Consumption by Business Type



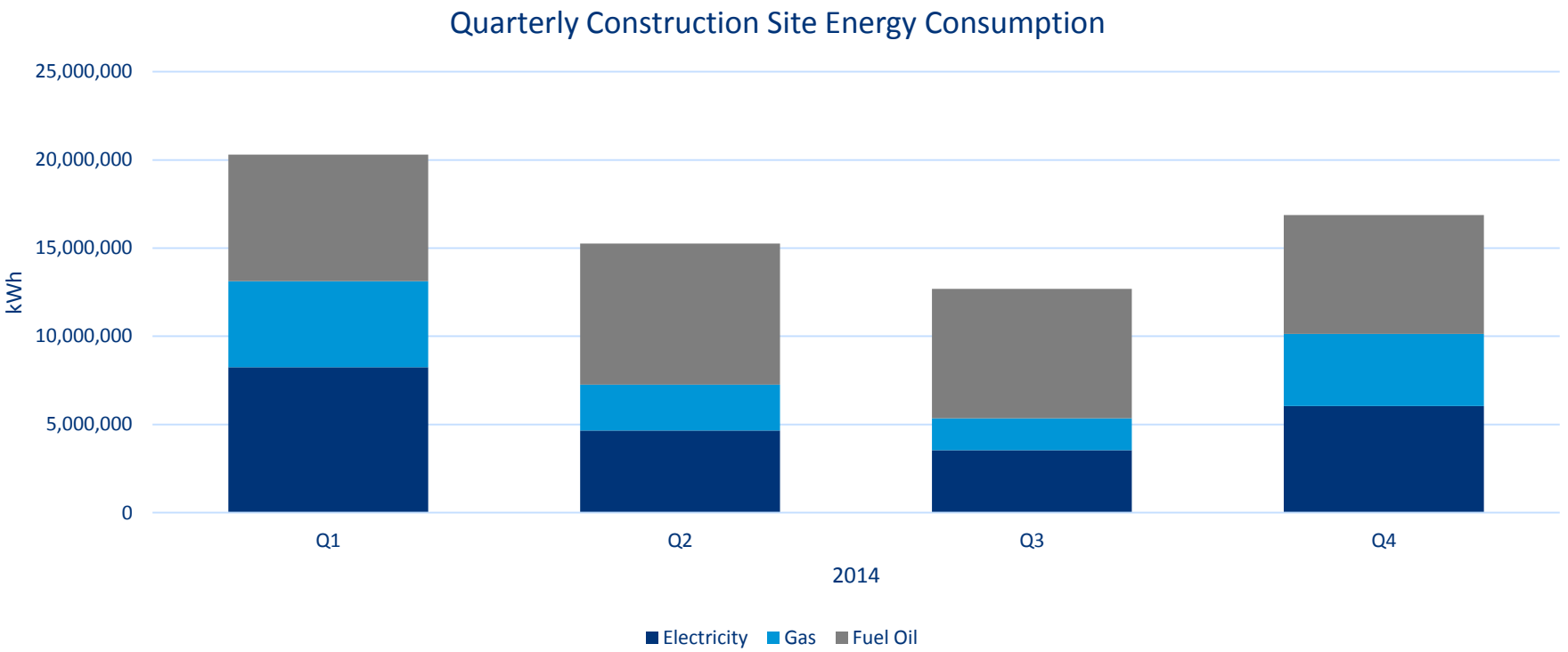
The above charts give an overview of total energy consumption within Taylor Wimpey over the course of the ESOS Reference Period. The total consumption amounted to 117,320,692 kWh. As can be seen the largest source of consumption is on-site fuel usage. Taylor Wimpey construction sites are primarily for the development of housing units. Each site has multiple individual plots. As shown above, the sites and plots together account for 69% of overall energy consumption. It should be noted that the Grey Fleet consumption (~18%) is estimated based on the methodology detailed in the Fleet Review Report.

Company Overview – Sites, Plots and Fleet



Looking at the division of energy usage within the business areas and fleet, it can be seen that fuel makes up the majority of the energy consumption on-site, and all of the company car contribution. The remainder of the fleet consumption is made up by claimed mileage expenditure. At the plot level, the majority of consumption is gas. The offices are classed as de minimis consumption.

Company Overview – Construction Sites



As shown on page 13, the largest portion of energy consumption occurs at the construction site level. Quarterly data is available for each site within Taylor Wimpey's operations for each fuel type, and has been summarised above. Breaking this down shows that fuel oil consumption remains constant, but gas and electricity varies with quarter. Highest consumption coincides with the coldest and wettest periods of the year, as heating and drying requirements increase.

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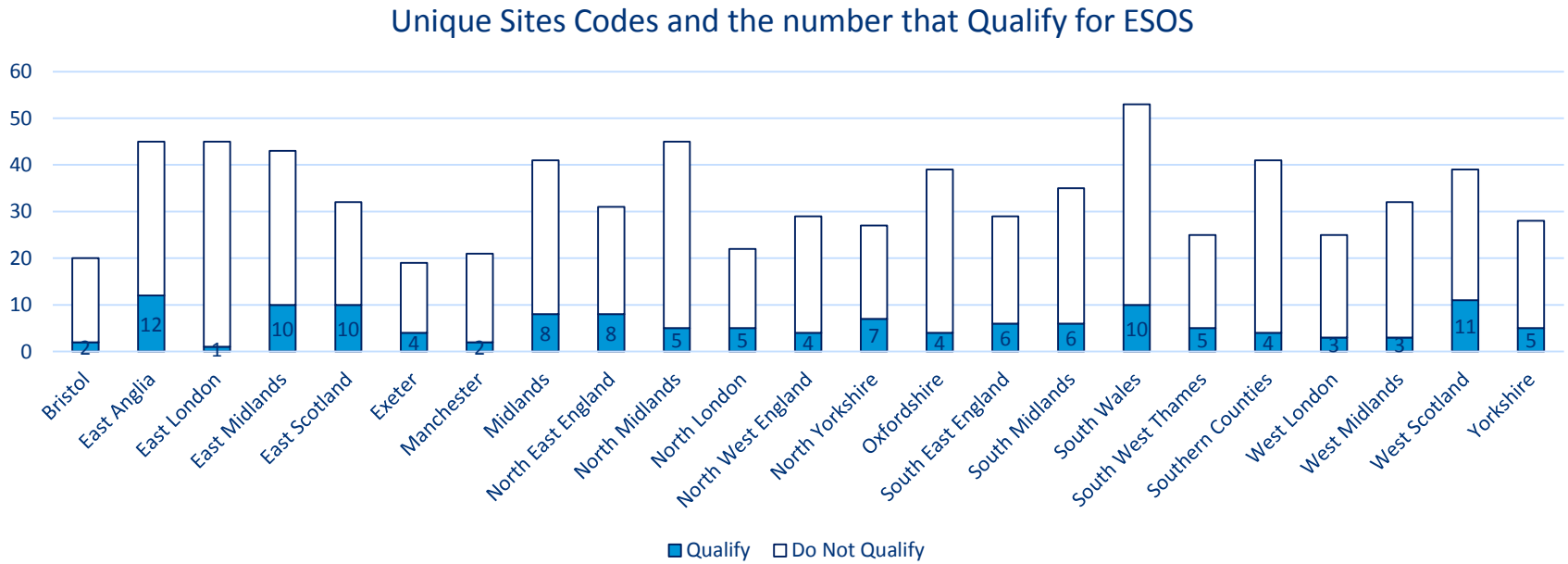
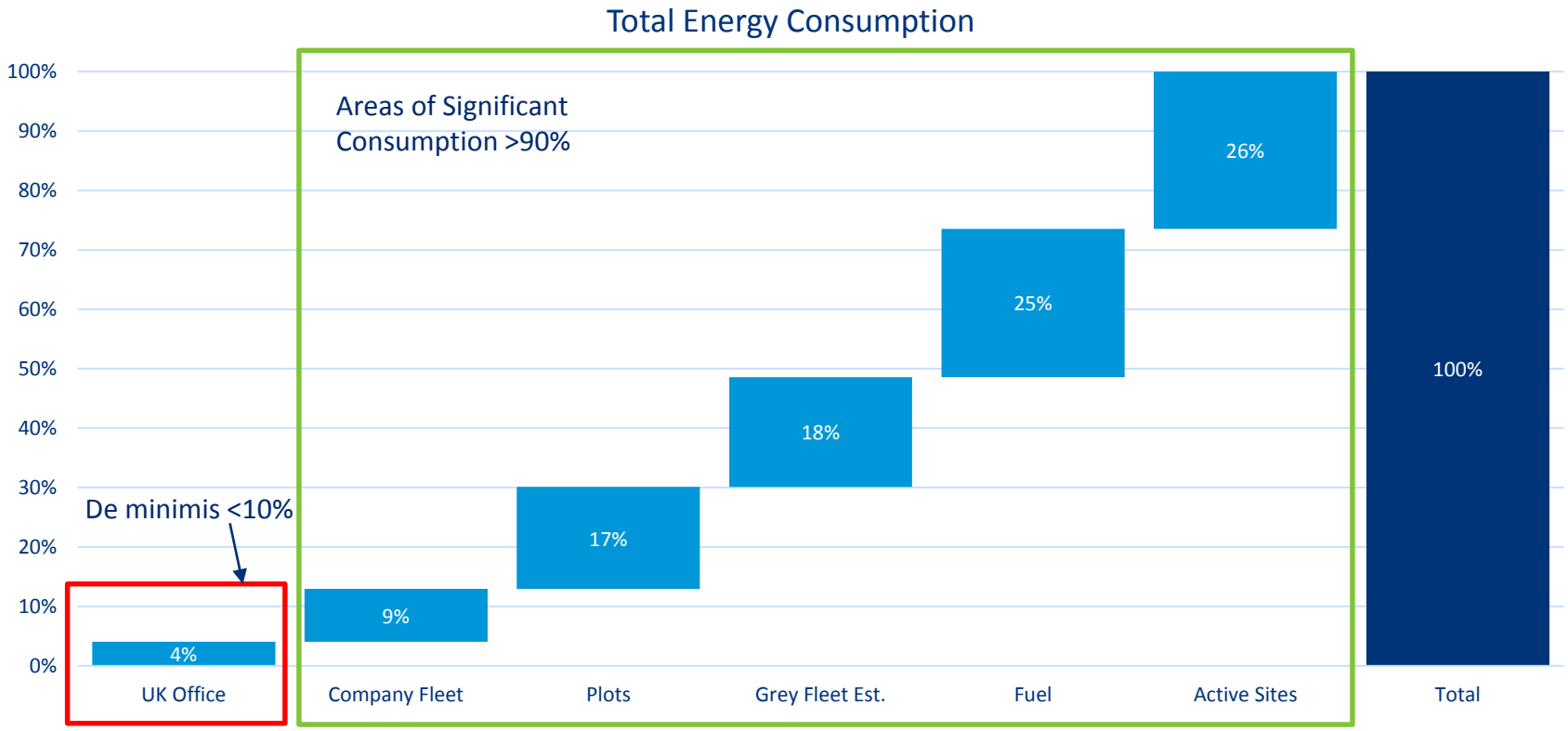
Assessed Energy Consumption



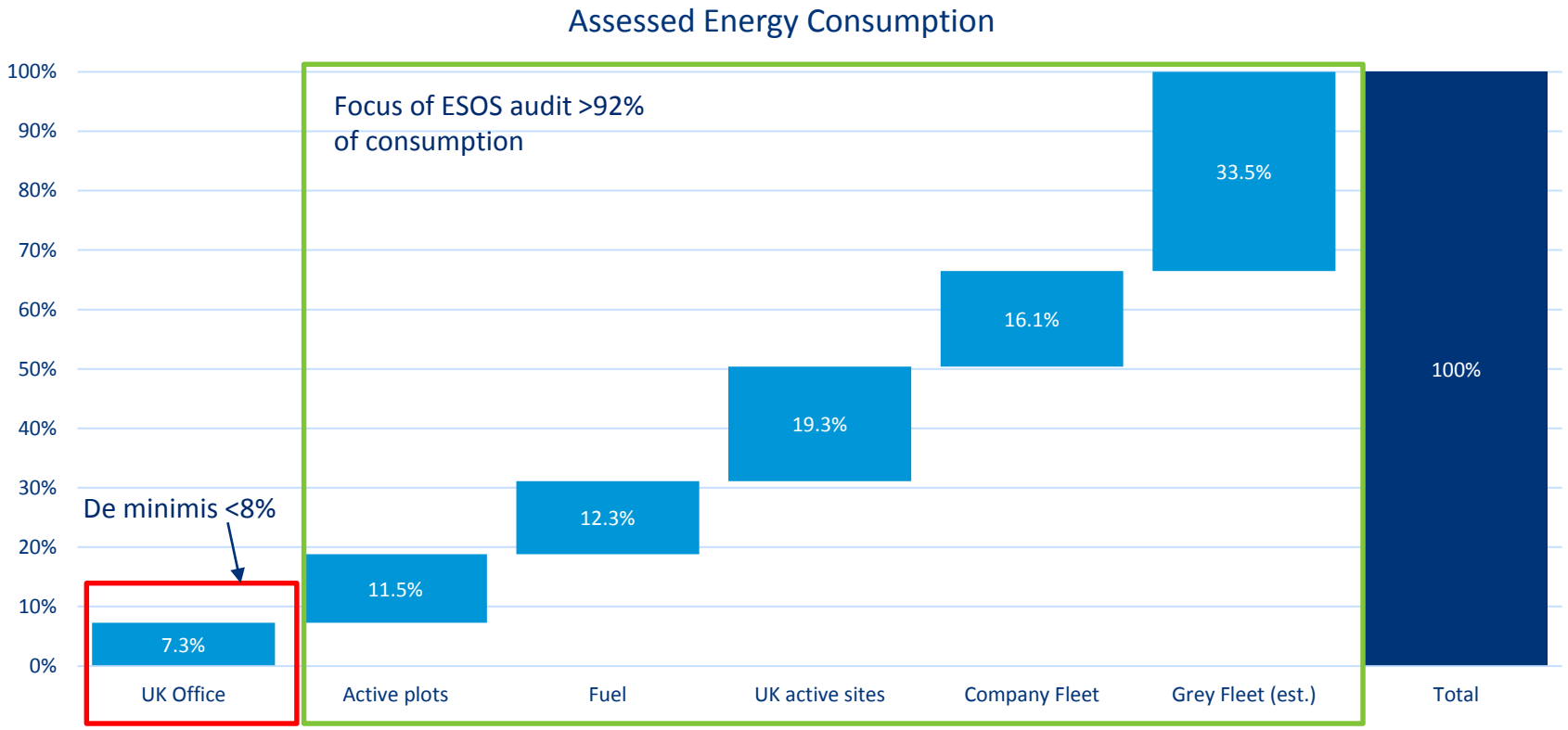
Part of the ESOS compliance requirements listed by the Environment Agency (see Appendix 1), prescribes that companies should only report the energy consumption of sites and plots that they owned or rented both on the qualification date (31 December 2014) and the compliance date (05 December 2015). As a construction company Taylor Wimpey has a high turnover of sites and the above analysis shows the total number of Taylor Wimpey's unique site codes that meet this ESOS qualification criteria. Of the 631 unique site codes, 135 sites qualify for ESOS, and these have all been included in the analysis. It should be notes that typically Taylor Wimpey have approximately 300 active sites at any one time. Throughout the reference period there has been significant turnover of sites, as well as many further completions due before the compliance date of 05 December 2015. It should also be noted that some sites are assigned a new site code upon progressing to a new phase. All these factors mean that the number of unique site codes exceeds the number of active sites.

Total Energy Consumption in 2014



At the outset of the ESOS compliance process the energy consumption of Taylor Wimpey was presented as above, based on energy data from 2014. As shown, offices were deemed de minimis. As discussed on page 16, ESOS regulations resulted in many of the existing sites and plots falling out of scope. This reduced the overall energy consumption assessed.

Assessed Energy Consumption – Site Qualification



An exercise was undertaken to check that the removal of the out of scope sites' relevant energy consumption (grid gas, electricity and plot consumption) from the overall energy consumption calculation, would not have an effect on the 'de minimis' calculation. As the above chart shows, the result of this analysis is to show that the initial approach is still valid. The contribution of fleet has increased as the vehicle fleet is not affected by the number of sites. This data was then used as part of the energy saving opportunities analysis.

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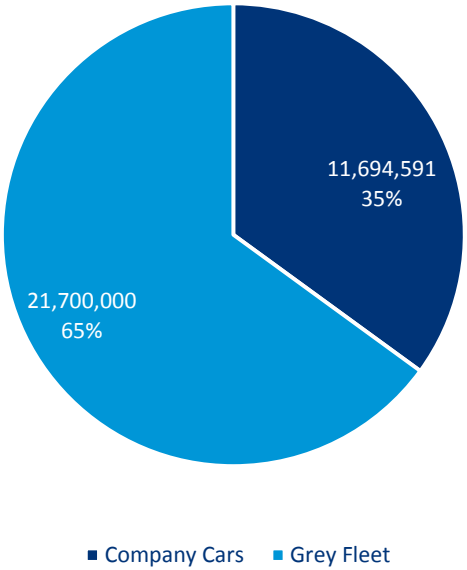
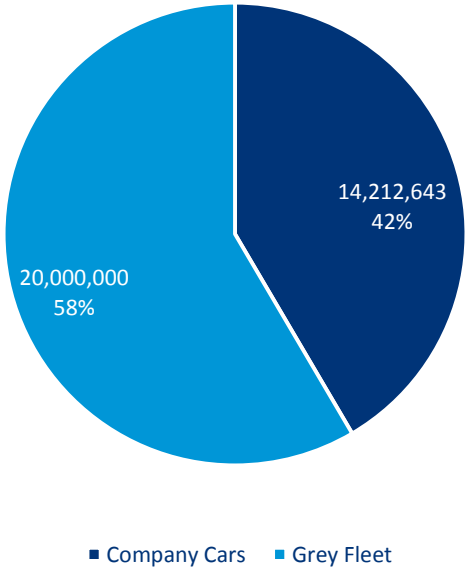
Fleet – Total Energy Consumption Overview

Energy Consumption by Fleet Type (kWh)



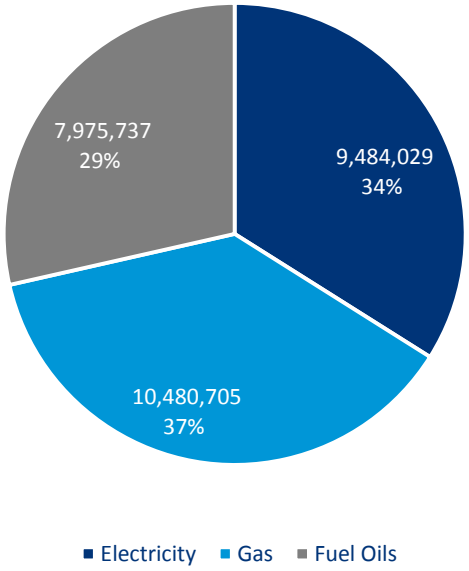
Mileage by Fleet Type



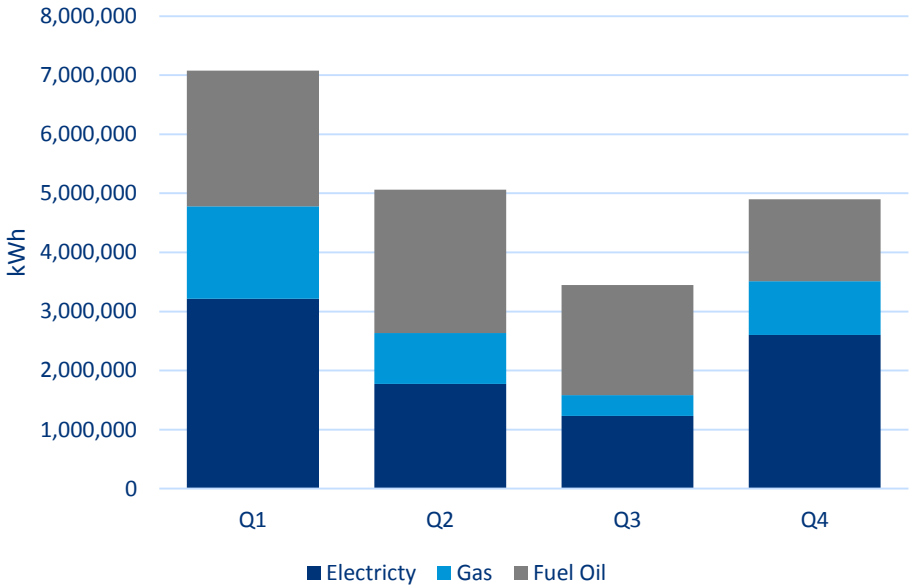
The largest area of qualifying energy consumption is Taylor Wimpey's fleet. The total energy consumption of this aspect of the business is 32,129,532 kWh. The fleet is predominantly made up of employees claiming mileage in their own private vehicles, and this has the largest energy impact. Note that the company cars have a higher share of mileage than of energy consumption. This is because the company car fleet is more energy efficient than the typical private vehicle. It should be noted that the size of the grey fleet (65% of consumption) was based on an estimate . The methodology for this can be found in the Fleet Audit Report.

Sites – Total Energy Consumption Overview

Total Energy Consumption (Construction Sites & Plots) by Fuel Source (kWh)

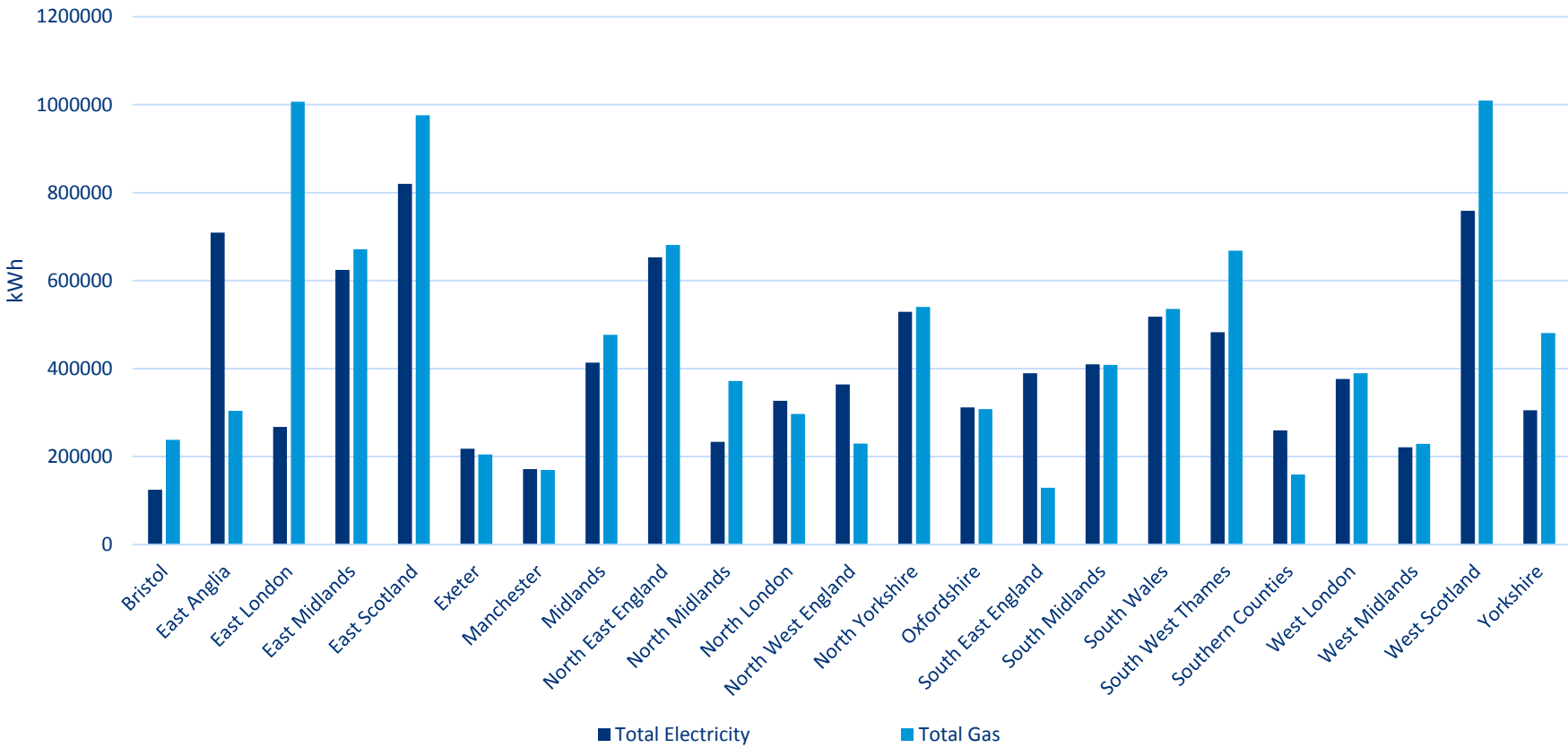


Quarterly Assessed Construction Sites only Energy Consumption



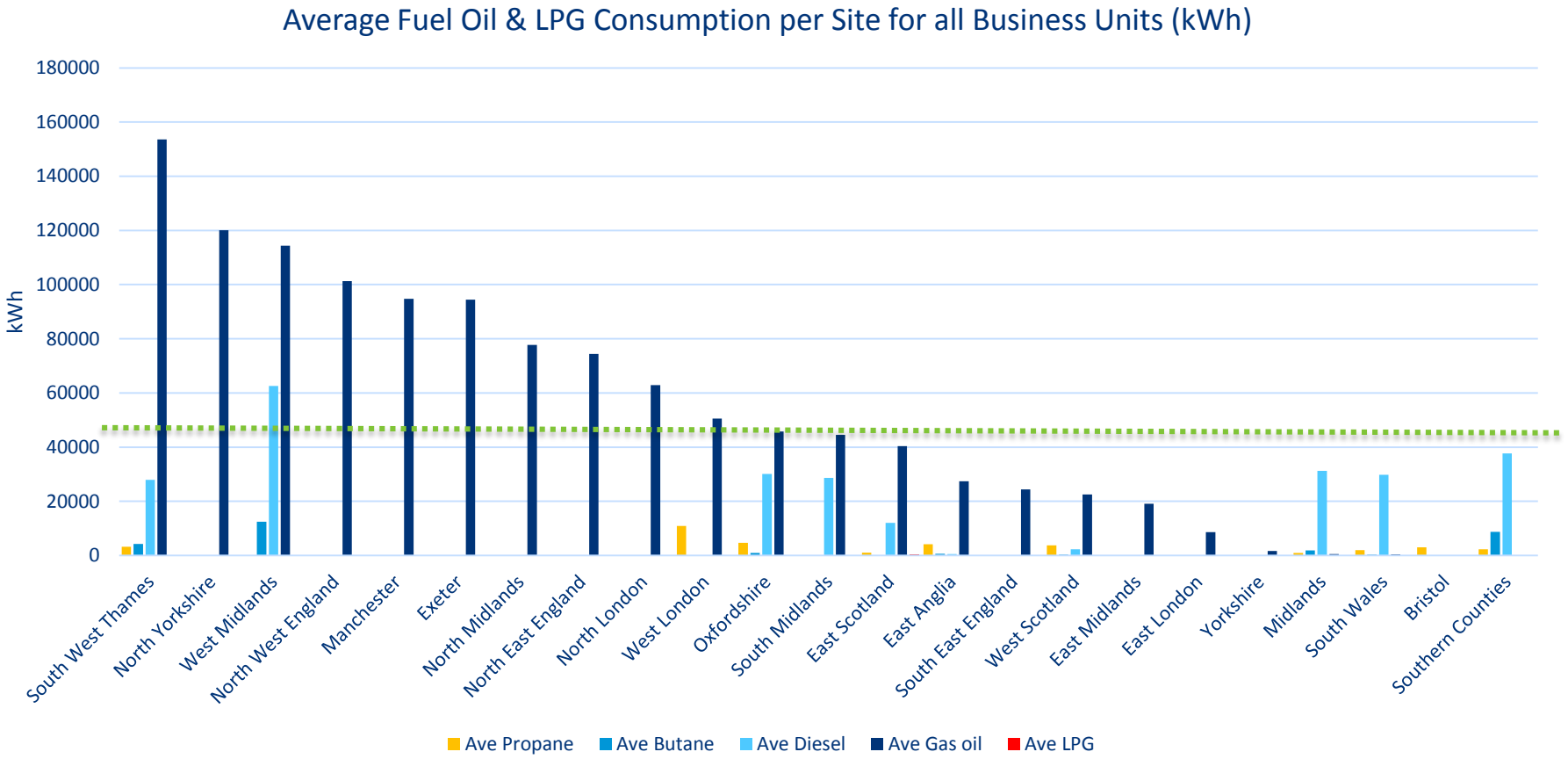
All sites within the scope of ESOS, as shown on page 16, have been grouped together. This is on the basis that in general the activities carried out on each site are similar, and that sources of energy consumption are consistent across all sites. This was supported by the findings from the individual site audits. As shown above to the left, gas is the largest contributor to consumption. The majority of the gas is used in the individual plots and the remainder is associated with the construction sites as shown in the site-only analysis to the right. Note that LPG is included within fuel oils.

Sites – Total Gas & Electricity Consumption by Regional Business Unit (RBU)



Taylor Wimpey consists of 23 separate regional business units (RBUs) around the UK, in addition to a central office. Over the course of the ESOS assessment period, it can be seen that Scotland has the highest energy consumption. Across all business units gas and electricity consumption are usually very similar. There are some notable outliers, such as East London. This may be due to operational differences or erroneous data collection.

Sites – Average Fuel Oil & LPG Consumption by RBU



On-site fuel consumption is large contributor to overall energy consumption. This analysis emphasises the differences in fuel use between business units. Gasoil is overwhelmingly the most frequently used fuel, but the average consumption per site varies from 0 to 155,000kWh. This may be due to operational differences, sub-contracting fuel use, or erroneous data collection.

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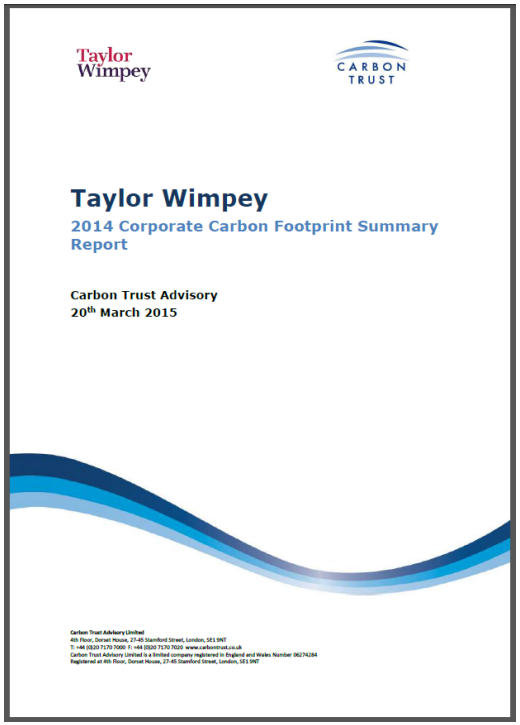
Previous Energy Audit Work (1/3)

- Taylor Wimpey's data for the ESOS compliance period has previously been compiled for their Mandatory Carbon Reporting 2014. This was compiled with the assistance of the Carbon Trust.



- The following pages give an overview of previous energy audits carried that have been carried out and how they relate to compliance with ESOS

Previous Energy Audit Work (2/3)

- Previous energy savings opportunity identification was conducted by CH2MHill in 2014 based on the analysis of the results of site surveys of 16 offices and 5 construction sites.
- This led to the development of:
  - Energy efficiency opportunity plan for offices
  - Recommendations on ways to 'enable energy efficient behaviours' for employees across all of Taylor Wimpey's operations
  - Updates to the specifications for:
    - Construction Compounds
    - Sales Centres
    - Show Homes
- These initiatives were developed based on a cost/benefit analysis of energy efficiency opportunities that were identified for:
  - Offices
  - Show Homes
  - Site Accommodation including Oasis Units

Previous Energy Audit Work (3/3)

- Other additional opportunities were identified (but with no cost/benefit analysis) for:
  - Sales Centres
  - Plots (during the post-completion (pre-handover) phase)
  - Behavioural change
- These previous site audit reports therefore did not cover opportunities for a number of energy using activities which will account for a large proportion of Taylor Wimpey's total energy consumption :
  - Plots (during the construction phase)
  - Street Lighting
  - Sewage pumping stations
  - Site consumption of diesel/gasoil by construction equipment
  - Grey fleet
- Additionally, based on the information provided:
  - The surveys did not provide a comprehensive breakdown of energy use for construction sites to the level required by ESOS
  - Show homes, sales centres and plots were also not covered in enough detail to provide sufficient energy use analysis to the level required by ESOS

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Rationale for Site Audit Selection

- Combined site and plot energy consumption is a large percentage of Taylor Wimpey's overall assessed consumption, totalling 43.1% of consumption. Of this, on-site gas is the largest contributor (in terms of kWh) and electricity (in terms of cost). As both site and plot energy consumption can be assessed on a single site visit, a selection of representative sites were chosen to be audited
- The remaining energy consumption is dominated by the fleet (49.6%), the review of which can be found in the fleet review pack
- Construction projects are fairly similar across Taylor Wimpey's business, as Taylor Wimpey specialise in house building. The key variables are the number of phases and size of the site, as well as stage of development
- The sites selected were chosen to give a representative cross section of all sites within Taylor Wimpey operation, and each site was from a separate business unit

- The sites audited were:
  - West Scotland: Cavalry Park, Kilsyth
  - South East: The Bridge, Dartford
  - North Midlands: Sutton Grange, Shropshire

- For an overview of energy consumption at each of the sites audited refer to the respective site audit reports

Sites audited and justification

- West Scotland: Cavalry Park, Kilsyth
  - Work began at this site in 2011, and is due to completed in 2017. On completion this site will comprise of 162 houses. This represents a mature development
  - The data reference period covers July 2014 – June 2015, during which around 40 plots were completed
  - The site has been fully metered since late 2012, and is unique in that there are measures in place to protect the local eco systems.

- South East: The Bridge, Dartford
  - This site represents a very large site. Development is split into tranches, currently in phase one of tranche four
  - The construction team mobilised to site in 2006, and are due to complete work in 2019. The development will comprise of 1,134 homes
  - Consideration of an 'eco-village' being built towards the end of the development

- North Midlands: Sutton Grange, Shropshire
  - This site is representative of a site at an early stage of development. Work began in July 2014 and completion is expected in 2017. Meters not installed until mid 2015
  - This is a fairly typical site, and will comprise of 150 houses when complete
  - Generators were used for 12 weeks before Taylor Wimpey's own accommodation could be installed

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Actions needed to comply with ESOS

Energy Analysis
- ESOS energy consumption assessment
- Verification of energy source data

Energy Audits
- Site audits for representative sample of sites
- Policy Review and Fleet Review
- Identify energy saving opportunities

Evidence Pack
- Collation of ESOS evidence pack
- Pack to be retained for two compliance periods

Notific-ation
- Taylor Wimpey Director and Lead Assessor sign-off
- Notification of compliance to EA by 05 Dec 15

How ESOS Compliance requirements were met

Agree ESOS boundary & reference period

- Taylor Wimpey entire UK operations
- Site sampling approach agreed. Reference period confirmed as 01 Jan 14 to 31 Dec 14

Review past & existing energy management efforts

- Energy management assessment conducted
- Existing energy efficiency initiatives reviewed

Conduct desktop review & site visits

- Fleet & site saving opportunities identified
- Audit reports prepared
- Results extrapolated

Notification of compliance

- Evidence pack collated
- Lead Assessor signoff
- Director signoff

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Appendix 1 - Minimum ESOS energy audit requirements

- The following information is taken from the Environmental Agency's ESOS guidance, available at:

  https://www.gov.uk/government/publications/comply-with-the-energy-savings-opportunity-scheme-esos

- The energy audit must, so far as reasonably practicable:
  - analyse your organisation's energy consumption and energy efficiency
  - identify any way in which you can improve your organisation's energy efficiency
  - recommend practical and cost effective energy saving measures for your organisation
  - identify the estimated costs and benefits of any energy saving opportunity -using Life Cycle Cost Analysis where appropriate
- The data used in any ESOS energy audits must:
  - detail a period of 12 consecutive months' energy use for the asset or activity
  - begin no earlier than 12 months before the start of the compliance period (for the first compliance period they must begin no earlier than 6 December 2010)
  - begin no earlier than 24 months before the start of the ESOS energy audit by the participant in the compliance period (for example, for an ESOS energy audit on say 1 April 2015, data must begin no earlier than 1 April 2013)
  - not extend beyond the compliance date (that is, not extend beyond 5 December 2015 for the first compliance period)
  - not have been included in energy audits for a previous compliance period
- All energy audits must be reviewed by an ESOS Lead Assessor

Appendix 2 - Environment Agency Guidance on Construction Activities

- Assets which you hold on the qualification date (31 December 2014) and still hold on the compliance date (5 December 2015) should be included in your total energy consumption calculation. Therefore assets which you hold such as portable buildings and machinery (regardless of which site they are on) should still be included in the calculation of total energy consumption because that is still an asset of your organisation on the compliance date.
- Items that would not have to be included in the calculation of total energy consumption include show homes or the office building under construction where you use grid electricity in the building during the construction of it but which you will no longer have responsibility for on the compliance date. However if you are using generators on sites then you must include the input fuels in your total energy consumption if you hold them on the qualification date and the compliance date.
- The nature of the construction sector is such that the approach to energy audits needs to be done in a way which is going to lead to the most benefit to the participant in terms of identification of energy saving opportunities. This may mean that it is more relevant to look at the overall activities you undertake (rather than target specific sites because construction sites are temporary and energy consumption is directly related to the stage of construction) and identify policies and opportunities that if instigated across the whole of your business would lead to energy efficiency savings. Hence for a range of construction activities such as excavation, site cabin use, on-site generators and so on, where the energy is your responsibility it will need to be audited and where practicable you should identify cost effective opportunities for energy savings.
- Please ensure that you record in your evidence pack your rationale for your ESOS assessment.

Environment Agency Guidance on Construction Activities

Most Benefit

- Approach to energy audits needs to be done in a way which is going to lead to the most benefit in terms of identification of energy saving opportunities

Overall Activities

- May be more relevant to look at the overall activities rather than target specific sites because construction sites are temporary and energy consumption is directly related to the stage of construction

Identify Policies

- Identify policies and opportunities that if instigated across the whole company would lead to energy efficiency savings

The Carbon Trust is a company limited by guarantee and registered in England and Wales under company number 4190230 with its registered office at 4th Floor Dorset House, Stamford Street, London SE1 9NT.
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