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Report for – Fairfax (Reading) Ltd
Reading Golf Club, Emmer Green
Energy and Sustainability Strategy – Ridge & Partners LLP Supplementary Emissions
Statement

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Report for: **Fairfax Acquisitions Ltd**

Main contributors: **J Juhler**
Ridge & Partners LLP

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1.0 Energy and Sustainability – Supplementary Emissions Statement

- 1.1.1 Policy CC3, Policy H5 and the Sustainable Design and Construction SPD together seek major residential development to achieve zero carbon operationally. This is to be achieved by a minimum 35% improvement in the dwelling emission rate (DER) over the target emission rate (TER), as defined in the 2013 Building Regulations, as well as a planning contribution to offset remaining carbon emissions (at a cost of £1,800 per tonne, based on a cost of £60 per tonne/year applied over a period of 30 years).
- 1.1.2 An Energy and Sustainability Statement and following addendum, dated March 2021, was submitted with the appeal application and it set out how the proposed development would achieve an 83% improvement over the TER, exceeding the 35% minimum on-site requirement. A financial contribution of £135,000 was offered to make up the shortfall and achieve net zero carbon operationally.
- 1.1.3 RBC have subsequently sought clarification from the appellant with regards to the Standard Assessment Procedure (SAP) methodology followed to calculate the 83% improvement over the TER. **The SAP calculations undertaken for the scheme followed the 2013 Building Regulations SAP methodology (SAP 2012) with the outputs manually converted to allow for more up to date SAP 10.0 emission factors – in line with guidance provided in the Sustainable Design and Construction SPD.** This Supplementary Emissions Statement will seek to explain this process that was followed and how it accords with RBC policy.
- 1.1.4 SAP is the government approved calculation methodology used to assess the energy and environmental performance of dwellings. SAP is updated relatively regularly, with versions having been published in 1998, 2001, 2005, 2009 and 2012. The version of SAP currently in force and utilised to assess compliance against the 2013 Building Regulations is SAP 2012. An update to SAP is overdue – and in part has been delayed due to the COVID-19 pandemic. A revised version of SAP is due to come into force in June 2022. This revised version of SAP is currently referred to as ‘SAP 10’ – post its implementation date in June 2022 this revised methodology will be referred to as SAP 2021 or SAP 2022.
- 1.1.5 With each revision of SAP, the calculation methodology is updated, and changes typically include the below:
- An update to the Target Emission Rate (TER). It is typically lowered in order to make emission targets more onerous for new developments and drive improved emissions performance in new homes;
 - General updates to the calculation process to allow for technological developments – i.e. the calculation tool is updated to allow for design features that were not available/ not commonly adopted in homes when the last version of SAP was developed; and
 - An update to carbon emission factors for various fuel types.
- 1.1.6 The carbon emission factor associated with different fuel types is integral to the SAP methodology. The carbon emission factor for a fuel type has the units kgCO₂/ kWh (or

kgCO₂e/kWh) – i.e. it is a measure of the carbon emission intensity of a fuel type. The carbon emission factor for electricity utilised in the SAP 2012 methodology is significantly out of date. The carbon intensity of the UK electricity grid has been rapidly decarbonising since 2012, as illustrated in Figure 1.1, below. An increase in both off-shore and on-shore wind power capacity in the UK partially accounts for this decarbonisation.

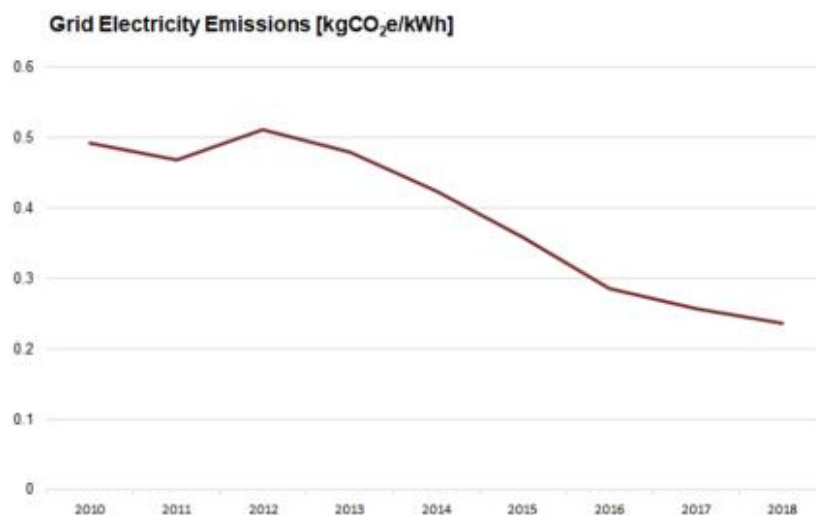


Figure 1.1: Grid Electricity Carbon Intensity between 2010-2018 (Source: UK GBC)

- 1.1.7 The revised SAP 10.0 emission factor for electricity is significantly lower than the SAP 2012 emission factor for electricity – 0.233kgCO₂/kWh vs 0.519kgCO₂/kWh.
- 1.1.8 In the UK, the Greater London Authority (GLA) were the first to require more reflective SAP 10.0 emission factors to be utilised to demonstrate compliance with the emission reduction targets set in their overarching planning policy that applied to all GLA boroughs. The use of SAP 10.0 emission factors aids in ensuring that more accurate CO₂ emission comparisons are undertaken when establishing what heat generation plant to specify for new developments – i.e. choosing between electricity fuelled and natural gas fuelled technologies. The London Plan and the supplementary GLA Energy Assessment Guidance document currently set a requirement for a minimum 35% emission reduction to be achieved beyond the 2013 Building Regulations TER on-site, but with the SAP outputs manually converted to account for the SAP 10.0 emission factors (with the exception being schemes connecting to district heating networks). The GLA produced a spreadsheet to assist applicants in undertaking this manual conversion process of 2013 Building Regulations SAP 2012 outputs. This conversion process does not adopt the full revised SAP 10 methodology – only the SAP 10.0 emission factors are incorporated.
- 1.1.9 The Reading Sustainable Design and Construction SPD sets out how Reading has adopted the same route, as per Section 3.34 – extract below:

‘Where a SAP assessment is required to demonstrate compliance with policy H5 for new-build residential, applicants are expected to use SAP 2012 carbon emission factors, as well as updated (SAP 10) carbon emission factors, to assess the expected carbon performance of a new development. Applicants should undertake this approach until such time as central

government adopts the new Building Regulations, at which point only SAP 10 emission factors shall be used. **Applicants should continue to use the current Building Regulations methodology for estimating energy performance against Part L 2013 requirements as set out in Policy H5 but with the outputs manually converted for SAP 10 emission factors. This is for demonstrating performance against planning policy targets and is separate to Building Regulation compliance**.

- 1.1.10 A link is also provided in the Reading Sustainable Design and Construction SPD to the GLA carbon emission reporting spreadsheet to aid applicants in completing this conversion to incorporate SAP 10.0 emission factors.
- 1.1.11 A summary of the undertaken emission calculations is provided in Table 1.1. The pertinent results are the scenario 2 emissions that have been based on the SAP 2012 methodology with the outputs manually converted to allow for SAP 10.0 carbon emission factors using the GLA carbon emission reporting spreadsheet. These scenario 2 results:
- Accord with the SAP emissions assessment process for demonstrating performance against planning policy, as dictated by Section 3.34 of the Reading Sustainable Design and Construction SPD.
 - Take into account a significantly more reflective, lower carbon emission factor for grid supplied electricity.

Table 1.1: Regulated CO₂ Emissions Performance Summary

Assessment Ref.	Assessment Procedure	Regulated CO ₂ Emission Reduction over Building Regulations TER	CO ₂ Offset Payment
1.	2013 Building Regulations Methodology (i.e. SAP 2012)	66%	£299,000
2.	2013 Building Regulations Methodology (i.e. SAP 2012) converted to allow for SAP 10.0 carbon emission factors	83%	£135,000

- 1.1.12 The emissions are also reported for the unadjusted 2013 Building Regulations CO₂ emissions scenario – without the fuel carbon emission factors adjusted to SAP 10.0

emission factors. Notably, the CO₂ emission reductions over the Building Regulations TER in this scenario still significantly exceed 35%.

- 1.1.13 In conclusion, the regulated CO₂ emissions for the development have been calculated using the 2013 Building Regulations (i.e. SAP 2012) assessment methodology, with just the carbon emission factors manually adjusted to allow for SAP 10.0 emission factors – in line with guidance provided in the Reading Design and Constructions SPD. The calculated emissions demonstrate that an 83% reduction in CO₂ emissions will be achieved over the TER – exceeding the minimum 35% on site reduction required. It is proposed for the remaining 17% of emissions to be offset via a £135,000 carbon offset payment.