



ENERGY STATEMENT



PARCELS 5-7, BERWICK GREEN, CRIBBS CAUSEWAY

JSP SUSTAINABILITY LTD
AUGUST 2023



CONTENTS

	Page
Executive Summary	2
1 Introduction	3
2 Policy Context	5
3 Combined Heat & Power	6
4 Energy Strategy	8
5 Evaluation	15

Report Completed By	JSP Sustainability Limited York Science Park, Innovation Centre, Innovation Way, Heslington, York. YO10 5DG 
Reviewed By	Gerard McGuigan BSc PGDipSurvey
Signature	
Revisions	Revision A – glazing u-values corrected.



EXECUTIVE SUMMARY

- The proposed development at Parcels 5-7 includes construction of 126 no. residential properties.
- Condition 12 of the Outline Planning Permission requires the constructed development to be energy efficient.
- Taylor Wimpey proposes the construction of energy efficient homes capable of delivering the reductions in energy consumption and CO₂ emissions over the minimum standards of the Building Regulations.
- Taylor Wimpey will pursue a low carbon electric heating strategy for the development, delivering zero carbon ready homes and a significant 66.54% saving in CO₂ emissions.
- Electrical vehicle charging points will be provided to each home.



1 INTRODUCTION

JSP Sustainability Ltd has been commissioned by Taylor Wimpey to prepare an Energy Statement to accompany the Reserved Matters planning application for the proposed residential development at parcels 5-7, Berwick Green, Cribbs Causeway. The application seeks approval for the design and construction of 126 no. homes, landscaping and associated highway works. This Statement addresses condition 12 of the Outline Planning Permission;

“Except for reserved matters applications for infrastructure, no applications for the approval of reserved matters in a geographical phase identified in the approved Phasing Plan (condition 5) shall be approved until an Energy Statement for the phase in question has been submitted to and approved by the Local Planning Authority. It shall commit to requiring developers to build to Building Regulations and local planning policy compliant renewable energy measures current at the at the time of the commencement of construction of that phase. The Energy Statement shall comply with the requirements of the Utilities and Renewable Energy chapter within the adopted Cribbs/Patchway New Neighbourhood Development Framework SPD and be in accordance with Policy CS4 of the South Gloucestershire Local Plan - Core Strategy and the prevailing development plans policy at the time. Applications for approval of reserved matters shall be in accordance with the relevant approved Energy Statement, and the development of each phase shall be implemented in all respects in accordance with the relevant approved Energy Statement.”

This Statement details the energy efficiency measures proposed by Taylor Wimpey to deliver reductions in energy and CO₂ emissions over and above the Building Regulations. A number of documents have been used to complete this report. These include;

National Planning Policy Framework (NPPF) includes a presumption in favour of sustainable development. The Framework expands upon the guiding principles and objectives of a successful planning system. These include the building of a strong and competitive economy, delivering high quality housing, requiring good design and meeting the challenges of climate change.

Approved Document L sets fabric efficiency standards and together with SAP, establishes a maximum CO₂ emission rate for new build residential properties. The Approved Document is the Government's sustainable design benchmark in England.

The Future Homes Standard: 2019 Consultation on changes to Part L and Part F of the Building Regulations for new dwellings. (January 2021) provides a summary of the received responses to the 2019 consultation and the Government's intentions to revise Part L of the Building Regulations in 2022 and introduce a FHS in 2025.

South Gloucestershire Local Plan Core Strategy includes policy CS1, High Quality Design. The policy requires all designs to take account of “orientation and location of buildings,...,lighting and soft landscaping to achieve energy conservation.” It further notes that “schemes that can



demonstrate that they will outperform statutory minima, such as the building regulations, in terms of sustainable construction, at the time of construction commencement, will be considered a primary indicator of good design.” Policy CS4, Renewable or Low carbon District Heat Networks, requires major development proposals to connect where practical and viable to an existing or new heat network. Evidence should be provided that such a connection or alternatives have been explored.

[Cribbs/Patchway New Neighbourhood Development Framework Supplementary Planning Document \(SPD\)](#) includes chapter 9, Utilities and renewable energy. The Strategy for the neighbourhood recommends a “fabric first” approach before considering opportunities for low carbon and renewable technologies. Guidance on maximising solar panels, connections to CHP, the use of biomass heat and the use of heat pumps is included in the SPD

[Policies, Sites and Places Plan 2017](#) includes policy PSP6, Onsite Renewable and Low Carbon Energy, which requires residential development on greenfield sites to reduce regulated and unregulated CO₂ emissions by 20% by renewable or low carbon technology.



2 POLICY CONTEXT

2.1 Local Policy

Policy CS1 of the Core Strategy requires Parcels 14-19 to “meet the building regulations current at the time of full planning or reserved matters approval.” This is mirrored in the wording of condition 12 of the Outline Planning Permission. Policy CS1 further requires all new development, including Parcels 5-7, to include passive and intelligent design measures to promote energy efficiency and conservation. Policy CS4 mandates, where practical and viable to install renewable, low carbon or Combined Heat and Power (CHP) generation in new major development or connect to an existing network. The policy however, does not include a renewable energy generation target and should be viewed within the context of policy CS1 which requires new development to meet the building regulations.

Within chapter 9 of the Cribbs/Patchway New Neighbourhood Development Framework SPD guidance is provided to developers on energy measures that should be considered. These include;

- Construct every home to a fabric first specification;
- Include measures to reduce energy consumption such as energy efficient lighting, providing drying facilities, bicycle storage and including home office spaces;
- Provide district heating in high density areas;
- Install solar panels on southerly facing roof slopes;
- Consider heat pumps for lower density areas; and
- Consider biomass heating for CHP and non-residential buildings

Policy PSP6 of the Policy, Sites and Places Plan 2017 requires greenfield residential development to include renewable or low carbon technologies capable of reducing total CO₂ emissions by 20%.

2.2 Emerging Local Policy

The consultation Local Plan 2020 document includes a number of relevant policies. Draft policy, Climate Change Mitigation and Adaption, notes;

“...all development proposals must;

2. maximise the generation of energy from renewable and/or low carbon sources; and

3. Integrate building-level and site-level measures into the design of the development to adapt to climate change impacts that are likely to occur over the lifetime of the development. Measures that lead to increases in energy use and carbon dioxide emissions should be avoided.”

Draft policy, Energy Management in New Development, includes targets specific to new residential development;



“All proposals for new residential development must;

- a) Minimise end user energy requirements over and above those required by Building Regulations (at the time of full planning or reserved matters approval) through energy efficiency measures by at least 10%, or, achieve any higher standard that is required under national planning policy; and then*
- b) Reduce carbon dioxide emissions by maximising the use of renewable energy generation sources on site and achieve an overall on-site reduction of carbon dioxide emissions from regulated energy use of at least 50%, unless the development includes flats where a 3% reduction is acceptable (for that part of the site only).”*

2.3 National Policy

The Government has legislated to achieve net zero carbon by 2050 at the latest and this necessarily will have considerable impacts on how new homes are constructed and heated. In January 2021 the Government published its response to the Future Homes Standard (FHS) consultation. In the response document the Government confirmed it would proceed with the Standard in 2025, subject to a public consultation on the full technical specification. The Standard is expected to deliver a 75% reduction in CO₂ emissions and require new homes to be heated from a low carbon heat source such that homes will be “zero carbon ready”.

In anticipation of the 2025 Standard, the Government amended Part L of the Building Regulations on June 15th 2022 to deliver a saving of 31% in CO₂ emissions. The revisions are expected to provide the industry and supply chains with the incentive, skills and time to prepare for the FHS in 2025.

The Part L 2021 Regulations include improved u-value backstops, the inclusion of a new Primary Energy target, updated CO₂ emission factors to take account of the progressive decarbonisation of the national grid and the retention of the Fabric Energy Efficiency Standard. The formulation of the target recipe also makes it necessary to include renewable generation or low carbon heating to deliver compliance with the target metrics.



3 COMBINED HEAT AND POWER

In brief a CHP system works as follows;

- A boiler consumes a primary fuel, typically gas or biomass, producing high pressure steam which is used to power a turbine, which in turn is connected to an electricity generator. The electricity produced can be consumed by the serviced development or exported to the National Grid.
- The heat which is given off by the turbine and the flue gases are recovered to provide space and hot water heating for the serviced community.
- Supplementary boilers are usually needed to meet peaks in heating and hot water demand.

3.1 Heat Density Energy Analysis

The proposed development is entirely residential in nature. SAP 2010 calculations have been carried out on every house type. These calculations have established that the site has a forecasted space and hot water energy requirement of 695,432.71kWh/year and corresponding Heat Density of 19.81kWh/m²/year. Research undertaken by DECC has estimated that areas with a heat density of less than 26kWh/m²/year (Poyry and Faber Maunsell, 2009) are unlikely to support a viable heat network.

3.2 Existing Analysis

An Energy Options Report, completed by URS in 2014, was submitted with the outline planning application. It confirmed that the site did not lend itself to a large-scale CHP district network. The Report identified two sub-areas as having some potential for a small-scale CHP provision, the school and community use area. However, this is unlikely to be economically viable. It will prove difficult for an Energy Services Company or ESCo to be contracted to design, install and operate a CHP network catering to such a small area. In any event these sub areas are not included in Parcels 5-7.

3.3 Biomass Heating

Chapter 9 of the Cribbs/Patchway New Neighbourhood Development Framework SPD requires recommends biomass heating for a potential CHP network. However, in the Climate Change Committee's 2018 "Biomass in a low carbon economy" publication, the Government was advised to bring to an end the use of biomass as a fuel source for energy generation and heat. Biomass should be prioritised for other uses, particularly those which lock in or store carbon for many years.



3.4 Conclusion

The installation of a CHP network was discounted at the outline planning application stage. A heat analysis of Parcels 5-7 supports this conclusion.



4 ENERGY STRATEGY

Taylor Wimpey will construct each home at the application site to a robust fabric and services specification capable of complying with the revised Fabric Energy Efficiency Standard. Furthermore, each home will be heated using modern low carbon air source heat pumps. Pursuing this electrified heating strategy in advance of the Future Homes Standard will allow each home to be labelled zero carbon ready at the point of first occupation.

4.1 Passive Solar Design

Policy CS1 requires all new development to adhere to the principles of passive solar design to reduce the need for lighting and heating. Some of the measures which are complimentary to passive solar design are listed below;

- The proposed layout and house type schedule have been informed through extensive dialogue with the planning and highways officers from South Gloucestershire Council. The plot positions have been determined by the shape of the site and the location of the access road and tributary road network within the site. As such, it is understandably not possible to design and site every home with a south facing rear elevation. That aside the majority of plots do have a southerly facing elevation, though not necessarily a rear elevation.
- The house type elevation drawings confirm that the rear elevation of each property accounts for a majority of the glazing provision to each home. The exception to this are the corner EMT plots, where a majority of the glazing is located on the side elevations, but importantly to the living room and kitchen/dining room.
- The glazing specification will have a BFRC solar transmittance factor, or g-value of 0.40 for the entire opening.
- The house types and apartment blocks include a range of 2, 2.5 and 3 storey types. A review of the site plan suggests overshadowing by adjacent buildings will not be a concern.



4.2 Ventilation & Summer Overheating

Resilience to climate change includes constructing homes that maintain an appropriate level of thermal comfort now and into the future. The following measures will ensure each home does not suffer from an unacceptable risk of summer overheating;

- Taylor Wimpey will construct each home using a traditional masonry construction. This form of construction will deliver a high level of thermal mass. In this way the building envelope and internal structures absorb heat both from the sun and internal heating. The heat is released when it is exposed to cooler temperatures. This helps the internal temperature remain cool when it is hot outside and hot when it is cool outside at different times of the day and year.
- The glazing specification strikes the correct balance between positive solar gain in the winter and unhelpful solar gain during warm summer months.
- Each home or building is 2, 2.5 or 3 storey. It will be possible for residents to open windows while in their homes, particularly at night and allow for natural ventilation. The exception are ground floor bedrooms in the proposed flat block and ground floor maisonettes. Mechanical ventilation will be provided in these bedrooms.
- Detailed overheating calculations will be submitted to the relevant building control body to demonstrate compliance with Part O of the Building Regulations prior to the commencement of works on site.



4.3 Energy Efficiency Measures

Taylor Wimpey's exposure to the marketplace has confirmed that purchasers demand energy efficient homes with low operating costs and technologies. As such the Group's current construction specification has been tailored to these demands and incorporates many of the lean and clean measures of the Energy Hierarchy. Listed below are some of the measures that will be incorporated into the detailed design of the scheme;

- The construction specification of every home will include high levels of insulation in the ground floor, external walls and roof spaces, capable of exceeding the minimum benchmarks of Part L and delivering compliance with the revised Fabric Energy Efficiency standard;
- Each house will be constructed using a traditional masonry method including the specification of an insulating aircrete block. This form of construction delivers thermal mass to the fabric of each home, which assists in the retention of beneficial heat but also aids in lowering the risk of summer overheating;
- The detailed house type designs will incorporate intelligent thermal bridging guidance, including the specification of thermally broken lintels, reducing a significant source of heat loss;
- The heating designs of each house type will include dual zone time and temperature controls with smart controls;
- Energy efficient lamps will be installed in every light fitting;
- Each property will be naturally ventilated using efficient decentralised continuous system 3 extract fans to ensure the internal living environment will be healthy and comfortable;
- High performance triple glazed units will be installed in every home; and
- Each entrance will be illuminated with an energy efficient external light or provision will be made for a purchaser to install such a fixture.

The table below provides a summary of the energy efficiency standards to be achieved in the design and construction of each new home;



Table 1 – Specification Summary

Element	Part L	Specification
Wall (houses)	0.26W/m ² K	0.25W/m ² K
Wall (flats)	0.26W/m ² K	0.20W/m ² K
Party Walls	0.20W/m ² K	0.00W/m ² K
Cold Roof	0.16W/m ² K	0.11W/m ² K
Floor	0.18W/m ² K	0.15W/m ² K
Glazing	1.60W/m ² K	0.96-1.10W/m ² K
Door	1.60W/m ² K	1.00W/m ² K
Air Permeability	8 m ³ /(h.m ²) @ 50 Pa	4.50 m ³ /(h.m ²) @ 50 Pa

4.4 Future Homes Standard

The Government is still to consult on a technical specification and the operation of transitional measures for the Future Homes Standard. At the time of writing, one cannot say with certainty if any of the plots at the application site will be constructed post the implementation of the Standard. However, Taylor Wimpey will comply with any revised Regulations, and where necessary adhere to revised energy efficiency standards on plots that may start following the introduction of the Future Homes Standard.

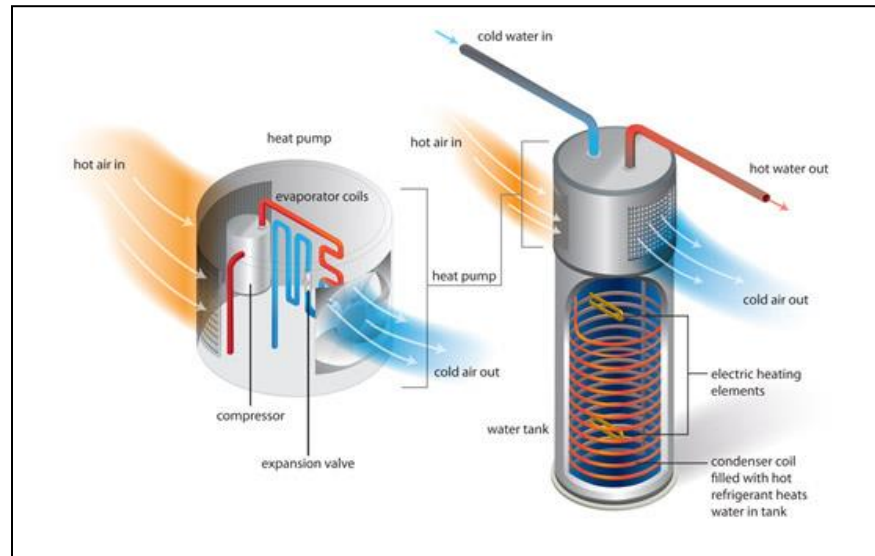
4.5 Air Source Heat Pumps

The services specification of every home will include low carbon heat pumps to provide 100% of each property's space heating and hot water requirement. The systems are highly efficient. Correctly designed, commissioned and installed systems operate with efficiencies of 300-400%. The systems are fed by mains electricity and their carbon reduction performance is expected to accelerate further as the national grid decarbonises. The technology has also been identified by the Climate Change Committee and the Government as the preferred solution to low carbon heating from 2025, when new connections to the gas grid are expected to stop.

Apartment blocks will benefit from an electrified heating and hot water strategy, incorporating heat pump hot water cylinders. The technology is a stand-alone hot water solution which utilises the ambient energy in the air of each apartment. The internal fan within the unit draws in the surrounding air, passing it through an evaporation coil filled with refrigerant, turning it into a vapour. This passes through a compressor, increasing its temperature. The vapour then passes through a hot water coil within the integral water tank to heat the domestic hot water supply.



Image – Hot Water Heat Pump



4.6 Photovoltaic Panels

The draft FHS recipe, published in January 2021, does not include an element of photovoltaic energy. Therefore, at the time of writing one can only comment that the provision of photovoltaic arrays is not necessary. Section 4.7 of this Statement will also confirm that they are not necessary to comply with the Building Regulations Part L 2021. However, a future consultation on the FHS may indicate a different approach. Taylor Wimpey will install PV arrays on the roof slopes of homes, should it be necessary to comply with future amendments to the Building Regulations.



4.7 Reduced Energy Consumption

The table below details the site’s forecasted emission rate and energy requirement.

Table 2 – Parcels 5-7 Emission Rate

House Types	Regulated Energy Requirement (kWh/year)	Regulated Energy Consumption (kWh/year)	Target Emission Rate (kg/year)	Emission Rate (kg/year)
EMB51	16,206.58	6,285.78	3,074.10	939.68
H1638	25,410.63	9,849.45	4,940.10	1,468.55
EMA47	35,471.00	13,880.20	6,252.17	2,066.11
H1420	28,620.52	11,243.04	5,347.41	1,675.03
EMA44	26,897.04	10,564.08	4,778.05	1,569.65
H1457	20,238.78	8,024.01	3,899.57	1,192.10
H1323	55,183.52	21,697.12	9,943.61	3,229.4
EMT42	19,292.79	7,581.42	3,503.43	1,125.98
EMT41	20,359.71	7,968.54	3,587.09	1,185.24
H1268	86,305.05	33,869.42	15,230.59	5,001.98
EMB32	58,902.90	25,353.80	11,191.60	3,757.18
EMT32	28,711.05	12,289.70	5,243.88	1,826.52
EMT31	45,991.52	19,521.44	8,344.32	2,896.90
EMA33	56,343.43	23,641.42	10,378.41	3,492.54
EMA32	61,465.56	25,790.64	11,321.90	3,810.05
EMAP41	5,663.28	2,429.06	1,015.99	359.22
EMAP32	30,836.46	13,053.24	5,606.78	1,927.33
EMAP22	61,593.22	25,690.08	11,562.43	3,784.64
H1208WC	5,807.68	2,516.38	1,018.78	372.50
H1044WC	5,245.90	2,229.16	949.64	328.54
B791	7,563.20	2,251.46	802.87	332.76
Flats	20,984.72	12,344.56	4,356.61	1,794.64
Maisonettes	9,058.35	3,784.62	1,678.35	556.59
Total	729,980.94	301,858.62	134,027.70	44,693.19

The calculations confirm that the site has a forecasted regulated energy requirement of 729,980.94kWh/year. The same calculations confirm a consumption forecast of 301,858.62kWh/year to meet this requirement. The difference is bridged by the renewable energy generated by the heat pumps. This is equivalent to 428,122.32kWh/year or 58.65% of the site’s energy requirement.

The calculations confirm a forecasted emission rate equivalent to a 66.54% saving over Part L 2021. This emission rate will lessen in sync with the decarbonisation of the National Grid.



4.8 Electrical Vehicle Charging

To facilitate the transition to low or zero carbon transportation, Taylor Wimpey will provide a 7kw/32amp electrical vehicle charging point to every home. An accompanying Electric Vehicle Charging Point Plan accompanies this Statement, confirming the provision. Taylor Wimpey has also confirmed that the electrical infrastructure for the site has sufficient capacity to meet demand for electrical vehicle charging and electrical heating.

4.9 Provisions for Energy-Efficient Operation

A home user guide will be placed in each home prior to occupation. The guide will include all necessary literature and guidance relating to the energy efficient operation of the fixed building services, including all manufacturer's literature and operation guides. "A" rated natural gas boilers will be installed in each home with time and temperature zone controls incorporating delayed start functions. The user guide will provide details on the efficient operation of the boiler to sustain efficiency and lower costs.



5 EVALUATION

Taylor Wimpey is required by condition 12 of the Outline Planning Permission for the residential development at parcels 5-7, Berwick Green, Cribbs Causeway to deliver an energy efficient development. Policy CS1 of the South Gloucestershire Local Plan Core Strategy encourages betterments over the Building Regulations as a means of demonstrating best endeavours. Furthermore, policy PSP6 of the Policies, Sites and Places Plan requires renewable technologies capable of reducing CO₂ emissions by 20%. In response to condition, policy CS1 and policy PSP6 Taylor Wimpey has advanced a robust fabric specification which will achieve the required betterments over the Building Regulations and will provide. [JSP Sustainability](#) was instructed by the developer to review these proposals. We can confirm;

- An Energy Options Report submitted as part of the outline planning application discounted the installation of a district CHP network. A heat analysis of parcels 5-7 confirms this opinion;
- The house type designs and build specification seeks to maximise passive solar gains to lessen the demand for space heating and artificial lighting;
- An electrical vehicle charging point will be provided to each home;
- The fabric specification includes high levels of insulation to reduce heat loss and the space heating requirement of every home, delivering compliance with the revised Fabric Energy Efficiency standard;
- The lighting, heating and ventilation services of each home will consume energy efficiently;
- The development will pursue an electric heating strategy in advance of the introduction of the Future Homes Standard;
- Low carbon and highly efficient heat pumps will be included in the services design of every house and flat;
- The heat pumps are forecast to generate 58.65% of the site's regulated energy requirement; and
- The site's emission rate will better the Building Regulations Part L by 66.54%. This emission rate will shrink in line with the decarbonisation of the National Grid.



In conclusion the strategy advanced by Taylor Wimpey will achieve savings in energy and CO₂ emissions. As such, the sustainable design proposals satisfy condition 12 of the Outline Planning Permission and we can recommend the approval of these measures by the local planning authority.