

**Land North West of Winchester Road,
Boorley Green**
Bellway Homes Ltd.

Energy & Sustainability Statement

AES Sustainability Consultants Ltd

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This statement has been commissioned by Bellway Homes Ltd. to detail the proposed approach to energy and CO₂ reduction to be employed in the development at Land North West of Winchester Road, Boorley Green. It should be noted that the details presented, including the proposed specifications, are subject to change as the detailed design of the dwellings progresses, whilst ensuring that the overall commitments will be achieved.

Contents

1.	Introduction	4
2.	Planning Policy	5
3.	Energy Consumption and CO ₂ Emissions	9
4.	Calculated CO ₂ Emissions	12
5.	Low Carbon and Renewable Energy Systems	13
6.	Waste Reduction Strategy	14
7.	Water Conservation	15
8.	Conclusions	16

List of figures & tables

Table 1. CO ₂ emissions improvements from successive Part L editions	5
Table 2. Policies and relevant comments	8
Figure 1. The Energy Hierarchy	9
Table 3. Benefits of the Fabric First approach	10
Table 4. Proposed Construction specification – main elements	10
Table 5. Part L compliant CO ₂ emissions	12
Table 6. Typical Water Demand Calculation	15

1. Introduction

Preface

- 1.1. This Energy and Sustainability Statement has been prepared by AES Sustainability Consultants on behalf of Bellway Homes Ltd. in relation to the development of the site known as Land North West of Winchester Road, Boorley Green, and details the proposed energy and carbon reduction strategy for the development.

Development Description

- 1.2. The proposed development is situated northeast of Southampton, less than 3 miles south of the village of Fair Oak, on the outskirts of Eastleigh. The site would form a second and third phase of development with the land sitting adjacent to other sites which were developed by Bellway Homes and Miller Homes.
- 1.3. The phases 2B, 3C, 3E & 3F will deliver 88 dwellings
- 1.4. Outline Planning (ref: O/15/75953) has been granted for:

Outline application for up to 680 residential units, mixed use comprising of retail and/or community/healthcare use, land for two-form entry primary school, formal and informal open space and sports pitches. New access off Winchester Road, associated on-site roads, infrastructure and footpaths/cycleways. Detailed matters for determination access (all other matters reserved - scale, appearance, landscaping and layout). This application is the subject of an Environmental Impact Assessment, is a departure from the Development Plan, is Major Development and affects the setting of a Right of Way.

Purpose and Scope of the Statement

- 1.5. This statement will demonstrate that the development achieves a 19% reduction in CO₂ emissions over a Building Regulations 2013 compliant development, through a combination of energy demand reduction measures and photovoltaic panels in order to reach a site wide performance equivalent to that required for Policy DM2 contained within the Eastleigh Borough Local Plan 2016-2036 and Conditions 29 & 30 of outline planning permission (ref: O/15/75953)
- 1.6. The statement will also demonstrate how water saving measures have been incorporated into the design in order to deliver an internal calculated water use per person per day of less than 110 litres in accordance with the requirements of Policy DM2.

2. Planning Policy

Current National Policy Standards

- 2.1. Government policy in relation to the energy performance of buildings has been evolving over the past decade, following government commitments to reduce the emission of greenhouse gases – particularly CO₂. This obligation was enshrined in the Climate Change Act 2008, which commits the UK to achieving a mandatory 80% reduction in the UK's CO₂ emissions by 2050, compared with 1990 levels.
- 2.2. In 2016, the UK government ratified the Paris Agreement, which provides a framework for governments to pursue the target of limiting global warming below 2°C.
- 2.3. In June 2019, the Government announced it will set a new net zero greenhouse gas emission target for the UK by 2050, compared with the previous target of at least 80% reduction from 1990 levels.
- 2.4. The built environment has a key role to play in delivering on these international commitments, as it accounts for approximately a third of overall CO₂ emissions. These commitments have been translated into national policies within the built environment driven by, amongst other mechanisms, the EU Energy Performance of Buildings Directive and the 2012 Energy Efficiency Directive.
- 2.5. Following the introduction of the 2013 edition of Building Regulations Part L, the successive updates now require regulated CO₂ emissions levels from new build domestic buildings to be approximately 30% lower than 2006 levels.

Table 1. CO₂ emissions improvements from successive Part L editions

Building Regulations	CO ₂ emissions improvements over L1A 2006
L1A 2006	-
L1A 2010	25%
L1A 2013	Circa 30%

¹ Department for Communities and Local Government, 2012, *NPPF*, paragraph 95

National Planning Policy Framework

- 2.6. On the 20th July 2021, the Government published the revised National Planning Policy Framework (NPPF), which sets out the Government's planning policies for England and how these are expected to be applied. At the heart of the NPPF is a presumption in favour of sustainable development.
- 2.7. Chapter 14 of the NPPF outlines its energy and climate change policies.

154. New development should be planned for in ways that:

- (a) Avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaption measures, including through the planning of green infrastructure; and
- (b) Can help to reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards.

- 2.8. This chapter also outlines the requirement of Local Plans to take account of climate change over the longer term, including factors such as flood risk, coastal change, water supply and changes to biodiversity and landscape. The key focus of the NPPF is to support local and regional planning authorities.

Current National Policy Standards

- 2.9. The NPPF requires that "local planning authorities should ...when setting any local requirement for a building's sustainability, do so in a way consistent with the Government's zero carbon buildings policy and adopt nationally described standards."¹
- 2.10. A policy announcement presented by HM Treasury as part of the July 2015 productivity plan "Fixing the Foundations"² advised that the Government considered that energy efficiency standards introduced through recent changes to Building Regulations 'need time to become established' and will therefore persist until further notice.

² HM Treasury, July 2015, *'Fixing the Foundations' Productivity Plan*

Local Plan

- 2.11. The Draft Eastleigh Borough Local Plan 2016-2036 is currently under examination. The policies contained within this plan have been reviewed, with Policies DM2 and DM3 considered relevant to sustainability.

Policy DM2, Environmentally sustainable development

The Borough Council requires that:

- a. all new build residential development must achieve at the time a Reserved Matters or Full Planning Application is submitted:
 - i. a 19% improvement in predicted carbon emissions, compared with the building regulations standard current at the time, through increased energy efficiency of the building fabric, unless this is superseded by an updated building regulations requirement equivalent to 'zero carbon homes'; and
 - ii. a predicted mains internal water consumption of no more than 110 litres/day.
- b. all non-residential and multiresidential development above 500 sqm of floor space measured externally (including extensions to existing buildings) must achieve;
 - i. BREEAM 'excellent' (or equivalent) or BREEAM 'very good' plus 'passivhaus' certification including a 15% improvement in predicted carbon emissions, compared with the building regulations current at the time, through low or zero carbon energy generation on site or in a Borough location agreed by the Council.
- c. All larger developments (above 150 dwellings or 10,000sq.m of floor space) must:
 - i. address sustainable development issues at the masterplan stage through BREEAM Communities 'excellent' certification; and
 - ii. fund post occupancy evaluation studies.

In addition to the above, all new residential development, and nonresidential and multi-residential development above 500sq.m. of floor space measured externally (including extensions to existing buildings) and external spaces should where practical and viable:

- d. incorporate energy-efficient passive design principles, the best use of natural daylight and natural ventilation systems wherever possible;

Policy DM2, Environmentally sustainable development Continued...

- e. connect to any existing near or adjacent low carbon local energy network unless this is proved unviable;
- f. use recycled, low embodied carbon, low environmental impact and locally sourced materials in construction where possible;
- g. be designed with sufficient flexibility to enable the life of the building to be extended by re-use for other purposes where feasible;
- h. aim to achieve a predicted mains internal water consumption of no more than 90 litres/day;
- i. aim to deliver at least 1% of all residential units which achieve full 'passivhaus' certification.

Policy DM3, Adaptation to climate change

All development should be designed to adapt to the predicted climate change impacts for the Borough.

- a. To reduce the potential impacts of surface water flooding, sustainable drainage systems need to be implemented as part of an integrated SuDS strategy for the site in accordance with policy DM6 (Sustainable surface water management and watercourse management) and as part of the landscape framework for the site including green open space and green roofs where appropriate.
- b. New development should have a cooling strategy which can include:
 - i. cooling through generous green infrastructure
 - ii. areas of shade
 - iii. water cooling
 - iv. building design and orientation to reduce overheating
 - v. 'cool roofs' or green roofs and green walls
 - vi. porous cool pavements
- c. To adapt to water stress, new development should be designed to reduce demand.
Measures can include:
 - i. Reduced residential mains water consumption (as per policy DM2)
 - ii. Water efficient appliances, fittings and leak detection devices for non-residential and multi-residential development
 - iii. Rainwater harvesting and grey water recycling
 - iv. Drought resistant landscape design

Planning Permission (ref: O/15/75953)

- 2.12. This statement will address Conditions 29 and 30 of the outline planning permission, reference O/15/75953.

Condition 29

Prior to the construction of any building above slab level in each individual phase of the development (or, in accordance with a timetable to be agreed in writing with the LPA), a BREEAM New Construction Interim Stage Certificate at "excellent" standard (for non-residential development); or (for residential development) design stage SAP data and a design stage water calculator confirming energy efficiency and the predicted internal mains water consumption shall be submitted to and approved in writing by the LPA. The development shall not be carried out otherwise than in accordance with the approved details.

Condition 30

Prior to the construction of any dwelling above slab level in each individual phase of the development (or, in accordance with a timetable to be agreed in writing by the LPA) a report shall be submitted to and approved in writing by the LPA which sets out how essential requirements set out within ESD 2-8 of Eastleigh Borough Council's Environmentally Sustainable Development SPD will be met within that phase. The development shall not be carried out otherwise than in accordance with the approved details.

Eastleigh Borough Council SPD

- 2.13. The Eastleigh Borough Council adopted in March 2009 includes following policies.

ESD 6 Carbon Dioxide Reduction (Small Scale zero/low carbon technologies)

The Council requires all buildings in new residential development of 10 dwellings or more to achieve*:

- Up to the end of 2011 at least one Code Ene 7 credit (10% carbon dioxide emissions reductions via local low/zero carbon energy)
- from January 2012 two Code Ene 7 credits (15% carbon dioxide emissions reductions via local low/zero carbon energy)

Code for Sustainable Homes

- 2.14. The Code for Sustainable Homes, as referenced in Policy ESD 6, was a scheme sponsored by the government, intended to promote and support the transition to more sustainable homes. It is the Government's view that the Code has achieved this aim, and has now been withdrawn following the conclusion of the Housing Standards Review on 25th March 2015.

- 2.15. The relevant extract from the statement to Parliament advises:

"From the date the Deregulation Bill 2015 is given Royal Assent, local planning authorities...should not set...any additional local technical standards relating to the construction, internal layout or performance of new dwellings. This includes any policy requiring any level of the Code for Sustainable Homes to be achieved by new development; the government has now withdrawn the Code..."

- 2.16. This change is required to be reflected through amendments to all Local Plans, Neighbourhood Plans and supplementary planning documents. It is therefore anticipated that the Local Plan will be updated accordingly in due course to remove the requirements mandating certification of new development to Code standards.

Proposed Strategy

- 2.17. This statement is intended to detail the approach to sustainable construction and energy and water demand reduction to be delivered at the proposed development of Land North West of Winchester Road, Boorley Green.
- 2.18. It is proposed that the dwellings will be constructed following a fabric first approach to meet, and exceed where possible, the current Building Regulations, with insulation standards, thermal bridging and air leakage all improved beyond the minimum compliance levels. In addition, consideration will be given to building design, passive solar design and energy efficient site-layouts where possible.
- 2.19. In line with Policy DM2 and ESD 6 contained within the local plan, SPD and conditions applied to these phases it is proposed that the development will deliver a 19% overall reduction in CO₂ emissions over Building Regulations Part L 2013 standards, through a strategy of energy demand reduction and the incorporation of low carbon or renewable energy systems.
- 2.20. The statement will also demonstrate how water saving measures have been incorporated into the design in order to deliver an internal calculated water use per person per day which improves upon the requirements of Policy DM2 for a maximum allowable internal water consumption of 110Litres per person per day.
- 2.21. Table 2 lists policies and identify how these are met.

Table 2. Policies and relevant comments

	Comments	Evidence
ESD 2	Submit details of the rainwater harvesting and/or grey water recycling systems supplying all WC flushing and other appropriate uses for that development	ESD 2 is not applicable due to the nature of the development.
ESD 3	Water Butts will be allocated to all dwellings to satisfy the policy.	Water Butt Location Plans submitted

ESD 4	All roofs and hard surfaces are drained by sustainable drainage systems	Drainage report
ESD 5	All dwellings make a full use of potential passive solar heat gain through the orientation. Dwellings have been designed to maximise the available daylight with windows specified to balance opportunity for natural lighting and whilst preventing the risk of overheating in a changing climate	This is addressed in the Design and Access Statement
ESD 6	By implementing the described energy efficiency and renewable energy measures the total reduction in regulated site wide CO ₂ emissions for dwellings is calculated as 63,754kgCO ₂ per year in total. 34.63% CO ₂ reduction has been achieved with the use of low or zero carbon energy modes	Design SAP's and PV schedule
ESD 7	Green roofs	N/A due to the nature of the development
ESD 8	All new streets created for residential development to provide at least 1 street tree1 per 30 linear metres of street - All new off-street2 car parks to provide at least 1 tree1 per 6 vehicle spaces - All new private back gardens to retain existing trees or (if no existing trees to retain) receive at least 1 newly planted tree	Landscape proposal / report

3. Energy Consumption and CO₂ Emissions

Energy Reduction Strategy – Fabric First

- 3.1. The proposed construction specification and sustainable design principles to be applied to the development will ensure that each dwelling meets the CO₂ reductions mandated by Part L1A of the Building Regulations through fabric measures alone.
- 3.2. It is proposed that the energy demand reduction strategy for the development incorporates further improvements beyond a Part L compliant specification and initially concentrates finance and efforts on reducing energy demand as the first stage of the Energy Hierarchy (Figure 1).

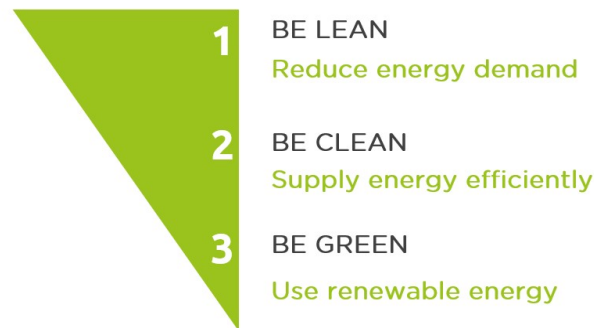


Figure 1. The Energy Hierarchy

- 3.3. As this hierarchy demonstrates, designing out energy use is weighted more highly than the generation of low-carbon or renewable energy to offset unnecessary demand. Applied to the development, this approach is referred to as ‘fabric first’ and concentrates finance and efforts on improving U-values, reducing thermal bridging, improving airtightness, and installing energy efficient ventilation and heating services.

Be Lean – reduce energy demand

- 3.4. The design of a development - from the masterplan to individual building design - will assist in reducing energy demand in a variety of ways, with a focus on minimising heating, cooling and lighting loads. Key considerations include:
- Building orientation – maximise passive solar gain and daylight
 - Building placement – control overshading and wind sheltering
 - Landscaping – control daylight, glare and mitigate heat island effects
 - Building design – minimise energy demand through fabric specification

Be Clean – supply energy efficiently

- 3.5. The design and specification of building services to utilise energy efficiently is the next stage of the hierarchy, taking into account:
- High efficiency heating and cooling systems
 - Ventilation systems (with heat recovery where applicable)
 - Low energy lighting
 - High efficiency appliances and ancillary equipment

Be Green – use low carbon / renewable energy

- 3.6. Low carbon and renewable energy systems form the final stage of the energy hierarchy and can be used to directly supply energy to buildings, or offset energy carbon emissions arising from unavoidable demand. This may be in the form of:
- Low carbon fuel sources – e.g. biomass
 - Heat pump technologies
 - Building scale renewable energy systems
 - Small-scale heat networks
 - Development-scale heat networks
- 3.7. This approach has been widely supported by industry and government for some time, particularly in the residential sector, with the Zero Carbon Hub³ and the Energy Savings Trust⁴ having both stressed the importance of prioritising energy demand as a key factor in delivering resilient, low energy buildings.

³ Zero Carbon Hub, Zero Carbon Strategies for tomorrow's new homes, Feb 2013

⁴ Energy Savings Trust, Fabric first: Focus on fabric and services improvements to increase energy performance in new homes, 2010

- 3.8. The benefits to prospective homeowners of following the Fabric First approach are summarised in Table 3.

Table 3. Benefits of the Fabric First approach

	Fabric energy efficiency measures	Bolt-on renewable energy technologies
Energy/CO ₂ /fuel bill savings applied to all dwellings	✓	✗
Savings built-in for life of dwelling	✓	✗
Highly cost-effective	✓	✗
Increases thermal comfort	✓	✗
Potential to promote energy conservation	✓	✓
Minimal ongoing maintenance / replacement costs	✓	✗
Significant disruption to retrofit post occupation	✓	✗

Building Regulations Standards – Fabric Energy Efficiency

- 3.9. In addition to the CO₂ reduction targets, the importance of energy demand reduction was further supported by the introduction of a minimum fabric standard into Part L1A 2013, based on energy use for heating and cooling a dwelling. This is referred to as the 'Target Fabric Energy Efficiency' (TFEE), and expressed in kWh/m²/year.
- 3.10. This standard enables the decoupling of energy use from CO₂ emissions and serves as an acknowledgement of the importance of reducing demand, rather than simply offsetting CO₂ emissions through low carbon or renewable energy technologies.
- 3.11. The TFEE is calculated based on the specific dwelling being assessed with reference values for the fabric elements contained within Approved Document L1A. These reference values are described as 'statutory guidance' as opposed to mandatory requirements, allowing full flexibility in design approach and balances between different aspects of dwelling energy performance to be struck so that the ultimate goal of achieving the TFEE is met. The proposed approach and construction specifications are set out in the following sections of this Strategy.

Improved Fabric Specification

- 3.12. In order to ensure that the energy demand of the development is reduced, the dwellings have been designed to minimise heat loss through the fabric wherever possible. Table 4 details the proposed fabric specification of the major building elements, with the first column in this table setting out the Part L1A limiting fabric parameters in order to demonstrate the potential improvements.

Table 4. Proposed Construction specification – main elements

	Part L1a Limiting Fabric Parameters	Specification
External wall – u-value	0.30 W/m ² K	0.23 – 0.25 W/m ² K
Party wall – u-value	0.20 W/m ² K	0.00 W/m ² K
Plane roof – u-value	0.20 W/m ² K	0.11 W/m ² K
Ground floor – u-value	0.25 W/m ² K	0.11 – 0.13 W/m ² K
Windows – u-value	2.00 W/m ² K	1.30 W/m ² K
Doors – u-value	2.00 W/m ² K	0.64 – 1.30 W/m ² K
Air Permeability	10 m ³ /h.m ² at 50 Pa	5.01 m ³ /h.m ² at 50 Pa

Passive design measures and overheating risk mitigation

- 3.13. In line with the requirements of Policy DM3 of the draft local plan, features to reduce the risk of overheating have been incorporated in to the design of the dwellings.
- 3.14. Where feasible, dwellings will be fitted with high-efficiency combination boilers, removing the need for hot water cylinders which would lose useful heat to the dwelling at the rate of around 1.5kWh/day, or circa 550kWh over the course of a year.
- 3.15. Glazing has been specified with a solar transmittance value (g-value) to strike the balance between useful solar gain in the winter to reduce heating demand and unwanted solar gain in the summer.
- 3.16. Dwellings have been designed to maximise the available daylight with windows specified to balance opportunity for natural lighting and whilst preventing the risk of overheating in a changing climate.
- 3.17. Windows are fully openable and wherever possible provided on opposite sides of dwellings to allow both natural cross ventilation and to maximise the amount of natural light received by the property throughout the day.
- 3.18. Due to these measures to reduce internal heat gain, natural ventilation provided through window openings and the opportunity for cross ventilation will allow sufficient air exchange rates to purge any heat build-up. Active cooling systems are therefore not proposed.
- 3.19. By following these principles, the development will be designed to build in resilience to a potentially changing climate over the lifetime of the buildings and minimise overheating risk, which can be exacerbated by the drive to build better insulated, more airtight homes if not considered within the design and construction process.

Thermal bridging

- 3.20. The significance of thermal bridging as a potentially major source of fabric heat losses is increasingly understood. Improving the U-values for the main building fabric without accurately addressing the thermal bridging will not achieve the desired energy and CO₂ reduction targets.
- 3.21. The specification seeks to minimise unnecessary bridging of the insulation layers, with avoidable heat loss therefore being reduced wherever possible. Accurate calculation of these heat losses forms an integral part of the SAP calculations undertaken to establish energy demand of the dwellings, and as such thermal modelling will be undertaken to assess the performance of all main building junctions.

Air leakage

- 3.22. After conductive heat losses through building elements are reduced, convective losses through draughts are the next major source of energy wastage. The proposal adopts an airtightness standard of 5.01 m³/h.m² at 50Pa, with pressure testing of all dwellings to be undertaken on completion to confirm that the design figure has been met.

Provisions for Energy-Efficient Operation of the Dwelling

- 3.23. The occupant of the dwelling should be provided with all necessary literature and guidance relating to the energy efficient operation of fixed building services. Currently it is assumed that all dwellings will be provided with modern gas-fired heating systems, fully insulated primary pipework, and controls including programmers, thermostats and Thermostatic Radiator Valves to avoid unnecessary heating of spaces when not required.

4. Calculated CO₂ Emissions

- 4.1. The development has been designed to meet the requirements of Part L1A of the Building Regulations 2013, therefore compliance with this standard forms the first stage in the sustainable construction approach.
- 4.2. Part L compliance is assessed through the Standard Assessment Procedure (SAP), which uses the 'Target Emission Rate' (TER) – expressed in kilograms CO₂ per metre squared of total useful floor area, per annum – as the benchmark. The calculated performance of the dwelling as designed - the Dwelling Emission Rate (DER) – is required to be lower than this benchmark level.
- 4.3. Calculations have been undertaken using house types constructed on this development following the construction specification in order to determine the expected performance and build a representative site model to establish the improvement over Building Regulations for site as a whole.
- 4.4. The total Part L compliant calculated baseline carbon emissions and the calculated carbon emissions for the proposed site are reported in Table 5.

Table 5. Part L compliant CO₂ emissions

	Site Wide CO ₂ emissions (kgCO ₂ /yr)	
Building Regulations 2013 Baseline	154,255	
After fabric measures	143,924	
After renewable energy	90,501	
	kgCO ₂ /year	%
Savings from fabric measures	10,330	6.70
Savings from renewable energy	53,423	34.63
Total savings	63,754	41.33

- 4.5. As demonstrated the site has been calculated to provide a significant improvement over Building Regulations, with an total 41.33% improvement in Fabric Energy Efficiency.

5. Low Carbon and Renewable Energy Systems

Combined Heat and Power (CHP) and District Energy Networks

- 5.1. Policy DM2 requires consideration of the use of more efficient use of energy sources e.g. installations deploying combined heat and power (CHP technology), or connection to existing district energy networks.
- 5.2. A CHP unit is capable of generating heat and electricity from a single fuel source. The electricity generated by the CHP unit is used to displace electricity that would otherwise be supplied from the national grid, with the heat generated as a by-product utilised for space and water heating.
- 5.3. The economic and technical viability of a CHP system is largely reliant on a consistent demand for heat throughout the day to ensure that it operates for over 5000 hours per year. Heat demand from mainly residential schemes is not conducive to efficient system operation, with a defined heating season and intermittent daily profile, with peaks in the morning and the evening. For this reason, the use of a CHP system is considered unfeasible for this development.
- 5.4. District heat networks benefit from a high density of heat demand such as large blocks of flats, when utilised in low density housing sites the benefits are often outweighed by heat losses from long pipe runs between dwellings. It is proposed that the development make use of high efficiency gas boilers which avoid the heat losses from transporting heat between dwellings, these losses can sometimes be in excess of 30%.
- 5.5. There are currently no heat networks which extend near the proposed development. High network heat losses associated with distribution to individual houses, as opposed to large high-rise apartment blocks and commercial developments mean that a new heat network to serve the area is not considered viable or an environmentally preferred option. Due to these reasons, the provision for future connection to a district heating system is also not proposed.

Solar Photovoltaics (PV)

- 5.6. It is considered that roof-mounted solar PV systems are the most appropriate method of renewable electricity generation for this development in order to meet an overall 19% reduction in CO₂ emissions.
- 5.7. Solar PV systems are a mature and well proven technology that is relatively easily integrated into building fabric and are adaptable to future system expansion. The systems generally require very little maintenance.
- 5.8. The technology offsets the high carbon content of grid supplied electricity used for lighting, pumps and fans, appliances and equipment when assessed under current SAP methodology
- 5.9. Solar resource is not limited by energy loads of the dwelling as any excess generation can be transferred to the national grid, or have the potential to be easily integrated with storage systems or electric vehicle charging as these technologies mature and become more commonplace.
- 5.10. PV panels are considered technically feasible for all buildings with suitable roof orientations on this development. The relatively low cost, high carbon saving potential and limited additional impacts mean that PV is considered a feasible option for this development.

PV Distribution

- 5.11. The PV panels are distributed to take advantage of favourable pitch and orientation where feasible, and grouped into cost-effective system sizes to ensure that the capital outlay for the systems is biased towards the energy-producing element – i.e. the panels themselves – rather than the balance of system components. This will additionally ensure that any ongoing maintenance requirements, including replacing the inverters during the working life of the panels, is minimised.

6. Waste Reduction Strategy

- 6.1. This section sets out details of additional resource efficiency and waste management principles to be applied at the development in line with Policy DM2.

Materials

- 6.2. The impacts of construction materials range from the depletion of natural resources to the greenhouse gas emissions and water use associated with their manufacture and installation.
- 6.3. Within the development choices will be made in order to reduce the consumption of primary resources and using materials with fewer negative impacts on the environment, including but not limited to the following;
- Use fewer resources and less energy through designing buildings more efficiently.
 - Specify and select materials and products that strike a responsible balance between social, economic and environmental factors.
 - Incorporate recycled content, use resource-efficient products and give due consideration to end-of-life uses.
 - Influence, specify and source increasing amounts of materials which can be reused and consider future deconstruction and recovery.

Waste

- 6.4. Sending waste to landfill has various environmental impacts, such as the release of local pollution, ecological degradation and methane emissions, in addition to exacerbating resource depletion. Waste in housing comes from two main streams; construction waste and domestic waste during occupation.

Household Waste

- 6.5. In this respect regard has been given to the policy advice contained in the NPPF together with the Council's current strategy in terms of waste and recycling to ensure that the new dwellings are provided with adequate storage facilities for both waste and recyclable materials.
- 6.6. Eastleigh Borough Council currently operate a household collection service through which households are able to recycle materials including paper and cardboard, plastic bottles and food containers, tins, and metal foils, as well as separate collections for food waste, glass, batteries and optional garden waste collections.

- 6.7. Future occupiers of the dwellings will be provided with an information pack detailing the Council's current collection arrangements for waste and recycling and advising of the nearest recycling centres to the Application site.

Construction Waste

- 6.8. The development will additionally be designed to effectively and appropriately monitor and manage construction site waste. Target benchmarks for resource efficiency will be set in accordance with best practice – e.g. m³ of waste per 100m² / tonnes waste per m².
- 6.9. Wherever possible materials will be diverted from landfill through re-use on site, reclamation for re-use, returned to the supplier where a 'take-back' scheme is in place or recovered and recycled using an approved waste management contractor. A target to divert 85% by weight/volume of non-hazardous construction waste will be applied.

7. Water Conservation

- 7.1. In line with Policies DM2 and DM3 of the draft local plan, water will be managed effectively throughout the development by the incorporation of appropriate efficiency measures.
- 7.2. Water efficiency measures including the use of efficient dual flush WCs, low flow showers and taps and appropriately sized baths will be encouraged with the aim to limit the use of water during the operation of the development to limit internal water use to a maximum of 110 litres/person/day.
- 7.3. Table 6 shows an example of a calculation carried out for the proposed development, resulting in a total internal water consumption of 94.66 litres/person/day, demonstrating how the development can achieve a result less than the maximum allowable internal water consumption 110 litres/person/day.

Table 6. Typical Water Demand Calculation

Installation Type	Unit of measure	Capacity/ flow rate of fitting	Resulting Water Consumption (litres/person/day)
WC (dual flush)	Full flush (l)	6	8.76
	Part flush (l)	3	8.88
Taps (excluding kitchen taps)	flow rate (l/min)	4	7.90
Bath	Capacity to overflow (l)	160	17.60
Shower	Flow rate (l/min)	6	26.22
Kitchen sink taps	Flow rate (l/min)	6	13.00
Calculated Use			104.02
Normalisation Factor			0.91
Total Consumption /L			94.66
External Use			5.0
Building Regulations 17.K			99.7

8. Conclusions

- 8.1. This Energy and Sustainability Statement has been prepared by AES Sustainability Consultants on behalf of Bellway Homes Ltd. in relation to the development of the site known as Land North West of Winchester Road, Boorley Green, and details the proposed energy and carbon reduction strategy for the development.
- 8.2. The statement has been prepared to address local and national policy relating to sustainable design and construction of dwellings.
- 8.3. The statement sets out a fabric first approach to sustainable construction, demonstrating that improvements in insulation specification, a reduction in thermal bridging and unwanted air leakage paths and further passive design measures will ensure that energy demand and consequent CO₂ emissions are minimised.
- 8.4. Calculations demonstrate that the design specification will deliver savings of approximately 41.33% over Building Regulations 2013 standards for carbon emissions.
- 8.5. Calculations demonstrate that solar PV systems installed on plots for phases 2B,3C,3E and 3F are sufficient to deliver CO₂ reduction required for a 19% improvement over site wide emissions from Building Regulations standards.
- 8.6. By implementing the described energy efficiency and renewable energy measures the total reduction in regulated site wide CO₂ emissions for dwellings is calculated as 63,754kgCO₂ per year. The 34.63% CO₂ reduction has been achieved with the use of low or zero carbon energy modes and it exceeds 15% required by the LPA.
- 8.7. The development is achieving the requirement of Policy DM2 of the Eastleigh Borough Local Plan 2016-2036 and Policy ESD 6 of the Eastleigh Borough SPD for residential development to achieve a 19% reduction in carbon emissions, in line with the standards required for previous phases of the development.
- 8.8. It has been determined that the maximum calculated internal water consumption would equate to 94.66 litres/person/day, and therefore meet the requirements of Policy DM2 which requires a maximum internal water consumption of 110 litres/person/day.