

Our Ref: D2252

17<sup>th</sup> November 2022

## Energy and Sustainability Statement Lyneham, Harwood

Site location: Residential development at  
Lynham  
Whiston  
Prescot  
L35 3TH

Client: Built Group Ltd

Assessor: Neil Unsworth  
Bridgewater Energy  
Accreditation ref EES/004187

## **ENERGY & SUSTAINABILITY STATEMENT**

This statement has been prepared by Bridgewater Energy on behalf of Built Group Ltd in support of the following proposed development:

Proposal: Residential development comprising of the erection of 20 no. dwellings together with associated parking and landscaping.

Address: Lynham, Whiston, Prescot, L35 3TH

### **Regulatory Energy Standards**

This project will be required to comply with the updated Building Regulations Approved Document L Volume 1 Dwellings 2021 that took effect on 15<sup>th</sup> June 2022.

The CO<sub>2</sub> emissions standards stipulated in this document are considered to be around 31% lower than the previous Approved Document L1A 2013 that was in force prior to this date. This means that the emissions levels that will be associated with this proposed development will be significantly lower than the vast majority of new residential projects that are currently being constructed within the local authority.

### **Proposed Energy Strategy**

It is proposed that the dwellings will incorporate enhanced construction and enhanced efficiency heating systems to reduce CO<sub>2</sub> emissions.

The dwellings will adopt a 'fabric first' approach to energy efficiency following the principle that the demand for energy should first be minimised before addressing how the energy is produced. The building fabrics will be highly insulated and this developer has a good record of producing airtight building envelopes. This will mean that energy efficiency will be embedded within the dwellings throughout their lifetime.

SAP energy assessment calculations will be required to be carried out to show that the dwellings will comply Approved Document L 2021. A sample SAP has been carried out on the end terrace houses to allow us to predict the specification standards that will be incorporated. A copy of the SAP assessment is attached to this statement.

The following U-values and air tightness rates are proposed:

|                                   |          |                         |
|-----------------------------------|----------|-------------------------|
| Thermal Transmittance (U-Values): | Walls:   | 0.19 W/m <sup>2</sup> K |
|                                   | Roofs:   | 0.09 W/m <sup>2</sup> K |
|                                   | Floors:  | 0.12 W/m <sup>2</sup> K |
|                                   | Glazing: | 1.20 W/m <sup>2</sup> K |
|                                   | Doors:   | 1.20 W/m <sup>2</sup> K |

|                       |                                        |
|-----------------------|----------------------------------------|
| Design air tightness: | 5.00 m <sup>3</sup> /hr.m <sup>2</sup> |
|-----------------------|----------------------------------------|

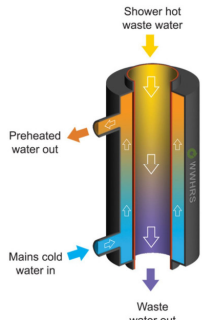
The dwellings will also incorporate construction details that have been independently assessed for thermal bridging leading to reduced heat loss at building junctions.

The heating controls in the two storey houses will be fully zoned so that the timing and the temperature settings can be varied in different areas of the house. This will mean that the heating will not operate in at a time when the room is not used. Delayed start thermostats will also be incorporated that will further reduce the time when the heating is operating unnecessarily.

All internal and external light fittings will be low energy. The external lighting will also have controls that restrict operation to 'dusk to dawn' periods.

## **Renewable and Low Carbon Technologies**

The use of renewable and low carbon technologies will be required to pass the SAP assessments. A number of the following technologies will be incorporated within the dwellings dependent upon their suitability for each plot:

|                                                                                     |                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <p>Flue Gas Heat Recovery:</p> <p>Mains gas combi boilers such as Ideal Code Combi ESP1 or Vaillant EcoTec Exclusive that have built in flue gas heat recovery. This simple technology effectively simply extracts heat from the hot flue gases to pre-heat the water entering the boiler to reduce the heating demand of the gas burner.</p> |
|   | <p>Waste Water Heat Recovery:</p> <p>These use the residual heat from the waste shower water to preheat the incoming cold feed that refills the hot water system. This means that less energy is needed to heat that water to the required temperature..</p>                                                                                  |
|  | <p>Photovoltaic Panels:</p> <p>Roof mounted photovoltaic (PV) panels convert light energy into electricity. They do not need direct sunlight to work effectively but more electricity will be generated with brighter daylight.</p>                                                                                                           |
|  | <p>Hot water heat pumps</p> <p>Units such as Dimplex Edel consist of a ducted system supplying external air to an internally installed heat pump mounted on top of a hot water cylinder. The heat pump collects energy from the air and efficiently uses it to heat the hot water within the cylinder.</p>                                    |

## **Sustainability Issues**

### Health & Well-being:

The dwellings have been designed to provide good daylighting levels to all rooms. Robust details will be adopted to avoid unwanted sound transmittance between dwellings to comply with Building Regulations Approved Document E. All dwellings will have access to private or semi-private amenity space. A communal cycle store is also being provided.

### Materials:

The construction materials used will have appropriate Chain of Custody or EMS certificates including FSC certification for construction timber. All insulants used in the dwellings will have a low global warming potential.

### Construction site impacts:

The contractor will adopt best practice policies in respect of air (dust) pollution arising from site activities and in respect of ground and surface water pollution. The contractor will also adopt a site waste management plan that minimises construction waste and diverts construction waste from landfill.

### Site location:

The site is located within a short (10 minutes) walking distance of local amenities such as shops, public transport, school and medical facilities.

## **Supporting information**

A copy of the sample SAP assessment for plots 1,4,5,8 is attached to this statement.

# Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Fri 18 Nov 2022 01:57:36

| Project Information |               |                 |                      |
|---------------------|---------------|-----------------|----------------------|
| Assessed By         | Neil Unsworth | Building Type   | House, Semi-detached |
| OCDEA Registration  | EES/004187    | Assessment Date | 2022-11-18           |

| Dwelling Details |                                            |                  |                           |
|------------------|--------------------------------------------|------------------|---------------------------|
| Assessment Type  | As designed                                | Total Floor Area | 69 m <sup>2</sup>         |
| Site Reference   | D2252-1,4,5,8                              | Plot Reference   | Planning stage assessment |
| Address          | Plots 1, 4, 5, 8 Lyneham, Whiston, Prescot |                  |                           |

| Client Details |                 |
|----------------|-----------------|
| Name           | Built Group Ltd |
| Company        | -               |
| Address        | -, -, -         |

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

| 1a Target emission rate and dwelling emission rate                       |                                         |  |    |
|--------------------------------------------------------------------------|-----------------------------------------|--|----|
| Fuel for main heating system                                             | Mains gas                               |  |    |
| Target carbon dioxide emission rate                                      | 12.79 kgCO <sub>2</sub> /m <sup>2</sup> |  |    |
| Dwelling carbon dioxide emission rate                                    | 12.03 kgCO <sub>2</sub> /m <sup>2</sup> |  | OK |
| 1b Target primary energy rate and dwelling primary energy                |                                         |  |    |
| Target primary energy                                                    | 66.93 kWh <sub>PE</sub> /m <sup>2</sup> |  |    |
| Dwelling primary energy                                                  | 63.47 kWh <sub>PE</sub> /m <sup>2</sup> |  | OK |
| 1c Target fabric energy efficiency and dwelling fabric energy efficiency |                                         |  |    |
| Target fabric energy efficiency                                          | 38.8 kWh/m <sup>2</sup>                 |  |    |
| Dwelling fabric energy efficiency                                        | 38.6 kWh/m <sup>2</sup>                 |  | OK |

| 2a Fabric U-values               |                                                        |                                               |                                         |     |
|----------------------------------|--------------------------------------------------------|-----------------------------------------------|-----------------------------------------|-----|
| Element                          | Maximum permitted average U-Value [W/m <sup>2</sup> K] | Dwelling average U-Value [W/m <sup>2</sup> K] | Element with highest individual U-Value |     |
| External walls                   | 0.26                                                   | 0.19                                          | Walls (1) (0.19)                        | OK  |
| Party walls                      | 0.2                                                    | 0                                             | Party Wall (1) (0)                      | N/A |
| Curtain walls                    | 1.6                                                    | 0                                             | N/A                                     | N/A |
| Floors                           | 0.18                                                   | 0.12                                          | Floor to GF (0.12)                      | OK  |
| Roofs                            | 0.16                                                   | 0.09                                          | Roof (1) (0.09)                         | OK  |
| Windows, doors, and roof windows | 1.6                                                    | 1.2                                           | Front door (1.2)                        | OK  |
| Rooflights                       | 2.2                                                    | N/A                                           | N/A                                     | N/A |

| 2b Envelope elements (better than typically expected values are flagged with a subsequent (!)) |                            |                              |  |
|------------------------------------------------------------------------------------------------|----------------------------|------------------------------|--|
| Name                                                                                           | Net area [m <sup>2</sup> ] | U-Value [W/m <sup>2</sup> K] |  |
| Exposed wall: Walls (1)                                                                        | 69.1175                    | 0.19                         |  |
| Party wall: Party Wall (1)                                                                     | 41.83                      | 0 (!)                        |  |
| Ground floor: Floor to GF, Floor to GF                                                         | 34.11                      | 0.12                         |  |
| Exposed roof: Roof (1)                                                                         | 34.91                      | 0.09 (!)                     |  |

| 2c Openings (better than typically expected values are flagged with a subsequent (!)) |                        |             |              |                              |
|---------------------------------------------------------------------------------------|------------------------|-------------|--------------|------------------------------|
| Name                                                                                  | Area [m <sup>2</sup> ] | Orientation | Frame factor | U-Value [W/m <sup>2</sup> K] |
| Front door, Composite                                                                 | 2.058                  | East        | N/A          | 1.2                          |
| Front windows, Window                                                                 | 2.856                  | East        | 0.7          | 1.2                          |
| Front windows, Window                                                                 | 2.856                  | East        | 0.7          | 1.2                          |
| Front windows, Window                                                                 | 0.966                  | East        | 0.7          | 1.2                          |
| Front windows, Window                                                                 | 0.798                  | East        | 0.7          | 1.2                          |
| Rear door, Glazed door                                                                | 3.339                  | West        | 0.7          | 1.2                          |
| Rear windows, Window                                                                  | 0.9555                 | West        | 0.7          | 1.2                          |
| Rear windows, Window                                                                  | 1.092                  | West        | 0.7          | 1.2                          |
| Rear windows, Window                                                                  | 1.092                  | West        | 0.7          | 1.2                          |

| 2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))                     |  |
|-------------------------------------------------------------------------------------------------------------------|--|
| Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction |  |

| Main element  | Junction detail                                                   | Source                                       | Psi value [W/mK] | Drawing / reference |
|---------------|-------------------------------------------------------------------|----------------------------------------------|------------------|---------------------|
| External wall | E2: Other lintels (including other steel lintels)                 | Calculated by person with suitable expertise | 0.14             |                     |
| External wall | E3: Sill                                                          | Calculated by person with suitable expertise | 0.06             |                     |
| External wall | E4: Jamb                                                          | Calculated by person with suitable expertise | 0.06             |                     |
| External wall | E5: Ground floor (normal)                                         | Calculated by person with suitable expertise | 0.1              |                     |
| External wall | E20: Exposed floor (normal)                                       | SAP table default                            | 0.32             |                     |
| External wall | E21: Exposed floor (inverted)                                     | SAP table default                            | 0.32             |                     |
| External wall | E6: Intermediate floor within a dwelling                          | Calculated by person with suitable expertise | 0.04             |                     |
| External wall | E10: Eaves (insulation at ceiling level)                          | Calculated by person with suitable expertise | 0.08             |                     |
| External wall | E12: Gable (insulation at ceiling level)                          | Calculated by person with suitable expertise | 0.05             |                     |
| External wall | E16: Corner (normal)                                              | Calculated by person with suitable expertise | 0.04             |                     |
| External wall | E17: Corner (inverted - internal area greater than external area) | Calculated by person with suitable expertise | -0.05            |                     |
| External wall | E18: Party wall between dwellings                                 | Calculated by person with suitable expertise | 0.04             |                     |
| Party wall    | P1: Ground floor                                                  | Calculated by person with suitable expertise | 0.07             |                     |
| Party wall    | P2: Intermediate floor within a dwelling                          | Calculated by person with suitable expertise | 0 (!)            |                     |
| Party wall    | P4: Roof (insulation at ceiling level)                            | Calculated by person with suitable expertise | 0.06             |                     |

### 3 Air permeability (better than typically expected values are flagged with a subsequent (!))

|                                             |                                                  |    |
|---------------------------------------------|--------------------------------------------------|----|
| Maximum permitted air permeability at 50Pa  | 8 m <sup>3</sup> /hm <sup>2</sup>                |    |
| Dwelling air permeability at 50Pa           | 5 m <sup>3</sup> /hm <sup>2</sup> , Design value | OK |
| Air permeability test certificate reference |                                                  |    |

### 4 Space heating

|                                                                                       |                       |  |
|---------------------------------------------------------------------------------------|-----------------------|--|
| <b>Main heating system 1:</b> Boiler with radiators or underfloor heating - Mains gas |                       |  |
| Efficiency                                                                            | 84.0%                 |  |
| Emitter type                                                                          | Radiators             |  |
| Flow temperature                                                                      | 45°C                  |  |
| System type                                                                           | Combi boiler          |  |
| Manufacturer                                                                          | Ideal Boilers         |  |
| Model                                                                                 | LOGIC CODE COMBI ESP1 |  |
| Commissioning                                                                         |                       |  |
| <b>Secondary heating system:</b> N/A                                                  |                       |  |
| Fuel                                                                                  | N/A                   |  |
| Efficiency                                                                            | N/A                   |  |
| Commissioning                                                                         |                       |  |

### 5 Hot water

|                                                                 |                             |  |
|-----------------------------------------------------------------|-----------------------------|--|
| <b>Cylinder/store</b> - type: N/A                               |                             |  |
| Capacity                                                        | N/A                         |  |
| Declared heat loss                                              | N/A                         |  |
| Primary pipework insulated                                      | N/A                         |  |
| Manufacturer                                                    |                             |  |
| Model                                                           |                             |  |
| Commissioning                                                   |                             |  |
| <b>Waste water heat recovery system 1</b> - type: Instantaneous |                             |  |
| Efficiency                                                      | 66.1%                       |  |
| Manufacturer                                                    | Recoup Energy Solutions Ltd |  |
| Model                                                           | Pipe+ HE                    |  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----|
| <b>6 Controls</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                     |     |
| <b>Main heating 1</b> - type: Time and temperature zone control by arrangement of plumbing and electrical services                                                                                                                                                                                                                                                                                                                                                                               |                     |     |
| Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |     |
| Ecodesign class                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |     |
| Manufacturer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                     |     |
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                     |     |
| <b>Water heating</b> - type: Cylinder thermostat and HW separately timed                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |     |
| Manufacturer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                     |     |
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                     |     |
| <b>7 Lighting</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                     |     |
| Minimum permitted light source efficacy                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 75 lm/W             |     |
| Lowest light source efficacy                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 75 lm/W             | OK  |
| External lights control                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | N/A                 |     |
| <b>8 Mechanical ventilation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |     |
| <b>System type:</b> N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                     |     |
| Maximum permitted specific fan power                                                                                                                                                                                                                                                                                                                                                                                                                                                             | N/A                 |     |
| Specific fan power                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | N/A                 | N/A |
| Minimum permitted heat recovery efficiency                                                                                                                                                                                                                                                                                                                                                                                                                                                       | N/A                 |     |
| Heat recovery efficiency                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | N/A                 | N/A |
| Manufacturer/Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |     |
| Commissioning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                     |     |
| <b>9 Local generation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                     |     |
| Technology type: <b>Photovoltaic system (1)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |     |
| Peak power                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1.5 kWp             |     |
| Orientation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | West                |     |
| Pitch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 30°                 |     |
| Overshading                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | None or very little |     |
| Manufacturer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                     |     |
| MCS certificate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |     |
| <b>10 Heat networks</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                     |     |
| N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |     |
| <b>11 Supporting documentary evidence</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                     |     |
| N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |     |
| <b>12 Declarations</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |     |
| <b>a. Assessor Declaration</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                     |     |
| This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report. |                     |     |
| Signed:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Assessor ID:        |     |
| Name:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Date:               |     |
| <b>b. Client Declaration</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                     |     |
| N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |     |