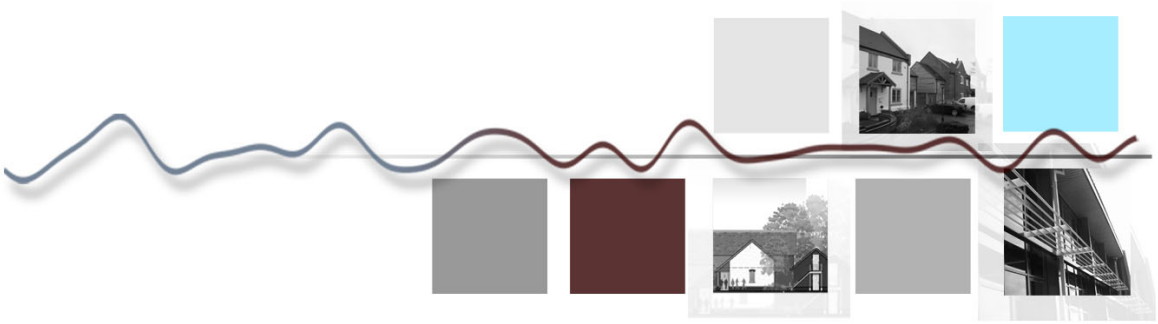

app doc 3: energy statement

proposed residential development on
land of former workshop
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1.0 Introduction

1.1 MTC Planning & Design Ltd are instructed by ADB Roofing Ltd to prepare this statement to support the submitted proposals. This report has been at the request of Wyre Forest District Council to assist with an application for the demolition of a redundant workshop and erection of a single dormer style bungalow. This document should be read in conjunction with application document no. 1, Design and Access Statement. This document provides detailed descriptions of the site, the proposals in terms of layout, scale, orientation, and massing.

1.2 The development is located in an area under the control of Wyre Forest District Council who declared a Climate Emergency in May 2019, demonstrating their commitment to this agenda. It is more important than ever that all development must achieve high quality design and environmental standards, taking into consideration the site and its surrounding setting. This report addresses policies relevant to the energy strategy as set out in both National and Local policy.

1.3 This report also provides detail on the proposed approach to meet specific targets relating to those policies, Building Regulations and energy use on site.

2.0 Planning Policy

2.1 The revised National Planning Policy Framework, was updated on the 20 July 2021, and has a section regarding sustainability in relation to energy and water consumption:

- Chapter 14: Meeting the challenge of climate change, flooding and coastal change places emphasis on, and sets out guidelines for local planning authorities, for local mitigation and adaptation measures for current and future climate change and for the support of the delivery of renewable and low carbon energy and associated infrastructure where viable.

2.2 The South Worcestershire Development Plan (SWDP) was adopted on 25th February 2016 and provides guidance with regard to energy and water consumption for development in the area. The Wyre Forest District Plan was adopted in April 2022, and similarly to the SWDP, provides guidance with regard to energy and water consumption.

2.3 SWDP 27: Renewable & Low Carbon Energy, states that all new development over one dwelling should incorporate the generation of energy from renewable or low carbon sources equivalent to at least 10% of predicted energy requirements, unless it has been demonstrated that this would make the development unviable. Large scale development proposals should examine the potential for a decentralised energy and heating network. If practical and viable, a decentralised energy and heating network should be provided as part of the development.

2.4 SWDP 30: Water Resources, Efficiency and Treatment, states that for housing proposals it must be demonstrated that the daily non-recycled water use per person will not exceed 110 litres per day.

2.5 Wyre Forest CP01: Delivering Sustainable Development Standards, states that all new development proposals must demonstrate how they reduce impact on the environment.

Wyre Forest Policy SP.37 - Renewable and Low Carbon Energy Sates;

1. All new developments, and where possible redevelopment of existing buildings, should consider location, design, siting and orientation to maximise the use of natural heat and light and the potential for renewable energy micro-generation. Where possible, in appropriate locations, solar panels should be fitted. All new residential, employment or commercial developments should include electric vehicle charging points. Incorporating Renewable and Low Carbon Energy into New Development

2. To reduce carbon emissions and secure sustainable energy solutions, all new developments over 100 square metres gross, or one or more dwellings, should incorporate the energy from renewable or low carbon sources equivalent to at least 10% of predicted energy requirements, unless it has been demonstrated that this would make development unviable. Applications will be required to include an Energy Assessment demonstrating how these requirements will be met. New developments should be built to the highest standards of energy efficiency, subject to the Government's policy for national technical standards and the viability of the development.

3.0 Building Regulations

3.1 Building Regulation Part L 2021 Edition, Conservation of Fuel and Power, came into force on the 15 June 2022 in England. On the 15 December 2021 the Government announced changes to the building Regulations to help the UK deliver net zero. This includes a requirement for new homes to produce around 30% less CO2 than current standards and a 27% reduction of emissions from other new buildings, including offices and shops.

3.2 The changes pave the way for the Future Homes and Building Standard in 2025, which will mean all future homes are net zero ready and will not need retrofitting, as the next step forward to Zero Carbon in new buildings.

3.3 New dwellings need to improve by a further 30% reduction in CO_2 emissions over the 2010 Target Emission Rate (TER). In addition, dwellings will have to meet a second mandatory target under Fabric Energy Efficiency Standard (FEES). FEES will give a value in terms of mass of CO_2 emitted per square metre of floor area per year. FEES have been included as a mechanism to ensure “fabric first” efficiencies are built into the main envelope of a dwelling.

3.4 Approved Document G - Sanitation, hot water safety and water efficiency (2015 edition with 2016 amendments) requires that the estimated consumption of wholesome water for a new dwelling should not be more than 125 litres/person/day (l/p/d) or 110 l/p/d where the optional requirement applies, as calculated in accordance with the methodology set out in the “Water Efficiency Calculator for New Dwellings”.

4.0 Energy Strategy

4.1 Proposals

4.1.1 Essentially the proposed scheme will follow the latest guidance to reduce CO_2 emissions by providing a "fabric first" approach. The following techniques will be considered:

- Increase insulation;
- Reduce the effects of thermal bridging;
- Effective air tightness; and
- Mechanical controlled ventilation.

4.1.2. As per the Energy Savings Trust Guide "Fabric First", October 2010, these methods alone can achieve the target 25% reduction in CO_2 emissions as required for Regulations Part L 2010.

4.1.3. To achieve the additional 30% reduction in CO_2 emissions to meet the 2021 Part L Regulations further improvements in fabric first insulation performances, window and door U values and increased air tightness can achieve this requirement, however there may also be a need for on-site renewable or low carbon technology as an alternative approach.

4.2 Fabric First Techniques

4.2.1 To achieve a reduction in CO_2 emissions the following techniques will be used, however, the total reduction in CO_2 emissions that will be possible cannot be calculated until detailed design stage when detailed design and construction techniques and materials are confirmed. It is anticipated that the following details and their confirmed specifications can be conditioned with any potential planning consent so that relevant details are provided prior to the commencement of development.

4.3 Walls

4.3.1 Enhanced U Values to be achieved by increasing the size of the cavity walls and increasing the insulation thickness.

4.4 Roof

4.4.1 Enhanced U Values to be achieved by increasing the size of the cavity walls and increasing the insulation thickness.

4.5 Floor

4.5.1 Installation of high-performance insulated ground floors will provide enhanced U values.

4.6 Window and Doors

4.6.1 Installation of high-performance insulated ground floors will provide enhanced U values.

4.7 Thermal Bridging

4.7.1 By employing enhanced construction details heat losses can be reduced.

4.8 **Air Tightness**

4.8.1 By following Passivehaus principles/standards air leakage rates can be significantly improved.

4.9 **Ventilation**

4.9.1 With excellent air tightness principles used appropriate ventilation will need to be installed in line with Building Regulations.

4.10 **Energy Demand and CO2 Reduction**

4.10.1 The most cost-effective solution is always specific to the development in question, i.e. the energy profile of what is being built and its location. At the Outline design stage there is not enough design information available (dimensions, layout, orientation, fabric type etc) to precisely predict the baseline energy demand for the dwellings, what the 10% requirement would be and therefore the CO_2 emissions. It is therefore proposed that this element is determined at detailed design stage. This can be secured via condition.

4.10.2 The final strategy for the site may well be based on a combination of fabric first techniques and the installation of appropriate renewable energy technologies, depending on the final site layout and individual building design. This would involve the inclusion or exclusion of energy efficient measures, or an increased or decreased capacity of renewable energy technologies, as applicable.

4.10.3 There is a broad range of renewable energy generation technologies available to developers including photo voltaic, solar thermal, wind, ground and air source heat pumps, together with potential site wide solutions. It is proposed that this will be determined at detailed design stage when the final design and construction specification details are known so the most appropriate technology can be specified.

4.11 **Low and zero carbon technologies**

4.11.1 This section reviews the feasibility of a range of Low and Zero Carbon (LZC) technologies that could be used to achieve a reduction in CO_2 emissions' and on-site energy generation.

4.11.2 The LZC technologies that could be considered for use at Hemming Street are:

- Photovoltaics;
- Solar Thermal Panels;
- Ground &Air source heat pumps; and
- Biomass Boiler.

4.11.3 This development would not be suitable for a Combined Heat and Power (CHP) plant. This type of technology is best suited to larger developments which have a high and constant demand for thermal energy allowing the CHP engines to operate at maximum efficiency for as long as possible throughout the year. Ideal situations include mixed development sites with over 400 domestic dwellings and those including leisure centres with swimming pools, hospitals or hotels.

4.11.4 Small scale, roof mounted turbines are not proposed for a number of reasons. The visual impact of several turbines across the development would be significant and unlikely to be acceptable. More significantly, studies by independent bodies such as Energy Saving Trust have shown that these turbines are not effective in generating power at domestic scale.

4.12 **Photovoltaics**

4.12.1 Photovoltaic (PV) panels use sunlight to produce electricity; the cells convert the sunlight into electricity which can be used to run household appliances and lighting. PV cells do not need direct sunlight to work and some electricity will be generated on a cloudy day.

4.12.2 Further advantages of PV systems are in their low maintenance requirements and reliability. This is a system hat the applicant can consider within he scheme but will be guided by the planning department on it's impact on a) the proposals, and b) on neighbouring properties.

4.13 **Solar Thermal**

4.12.1 An alternative use of solar energy would be the installation of solar thermal panels for the generation of hot water; solar water heating systems use heat from the sun to warm domestic hot water. A conventional boiler or immersion heater is then used to make the water hotter or to provide hot water when solar energy is unavailable. Solar thermal panels are a tried and tested technology that offers good paybacks. However, for optimum performance they need to be located on roofs with an orientation of ±40° of south.

4.12.2 The downside of this technology is that their contribution to carbon reduction can be less than other LZC technologies as they negate a gas demand instead of an electrical one. (The carbon emissions from gas are approximately 3 times lower than those associated with electricity.)

4.13 **Ground Source Heat Pump**

4.13.1 Ground source heat pumps (GSHP) circulate a mixture of water and antifreeze around a loop of a pipe which is buried externally. Heat from the ground is absorbed into this fluid and is pumped through a heat exchanger in the heat pump. Low grade heat passes through the heat pump compressor and is concentrated into a higher temperature; this useful heat is capable of heating water for the heating and hot water circuits of the house. However, the pumps do use electricity to distribute this heat around the home; therefore, they can result in higher carbon emissions than the use of gas heating in an efficiently designed home.

4.13.2 In addition, although relatively low, the density of the proposed layout is unlikely to allow for pipework to be laid in trenches and would require the more costly approach of using boreholes. Feasibility work would be required to determine whether the site is suitable for the use of the boreholes, and whether the ground conditions would be adversely affected by the number of boreholes required.

4.14 **Air Source Hat Pump**

4.14.1 Air source heat pumps reclaim the heat available in ambient air and convert it to higher temperatures to heat the home. As with ground source heat pumps, they use electricity to distribute heat. Air source systems do not require ground works and are therefore less costly

than ground source systems; however, this also means they are less efficient as the temperature of the air varies significantly more than the temperature of the ground throughout the year. Although this system is an efficient way of providing heating and hot water using electricity, the carbon emissions will still be significantly higher than if gas were used.

4.14.2 The Energy Saving Trust does not recommend heat pumps for properties supplied by an existing gas network. Given that the Hemming Street can be fed by a connection to a mains gas network, and due to the availability of less costly options, at this stage it is not

4.14 **Biomass Boilers**

4.14.1 Biomass fuelled heating systems generally burn wood pellets, chips or logs to power central heating and hot water boilers or to provide warmth in a single room. Other fuel types are available, but the energy density of wood chips or pellets means it is typically the most appropriate solution for applications within the built environment. Although savings on carbon emissions are significant, other implications need to be considered, especially the requirement for regular deliveries of fuel which would result in unacceptable volumes of traffic around the site. Also, for most urban UK dwellings built with a high thermal performance level, the output of even the smallest high-performance boiler on the market (5-10kW) is completely excessive, making both the capital costs and ongoing running costs uneconomic.

4.14.2 Given that the other technologies present fewer operational, environmental and practical concerns, the use of biomass heating has not been considered further. However, the applicant may reconsider this option at the detailed design phase of the project.

4.15 **Water Efficiency**

4.15.1 To ensure the water consumption targets are achieved, the developer will consider the types of fittings, e.g. dual flush wc's, low flow taps, economically shaped baths and efficient white goods if included in the development. This detail is not known at this stage so it is proposed that this determined at detailed design stage.

4.15.2 The applicant could also consider a combination of technologies that will best suit the development and meet the reduction targets.

4.16 **General design principals**

4.16.1 The general layout of the proposed bungalow (as discussed in further detail within application document no. 1 – Deign and Access Statement), ensures that key living spaces faces southeast, benefiting from peaks in light times and assisting in the natural heating of the building. The position of the bungalow within the site would ensure that the dwelling are not cast within the shadow form neighbouring dwellings.

4.16.2 The propels will include on site electric points for sustainable car travel and a secure bicycle store to encourage environmentally friendly modes of travel.

5.0 Conclusions

5.1 The proposed development at Hemming Street, Kidderminster, addresses National and Local policies.

5.2 The proposed strategy is based on an improvement in standard energy efficiency to meet Part L of the Building Regulations 2021. Full details of how the scheme will fully achieve any Part L Building Regulation targets can only be confirmed at detailed design stage but will encompass a 'Fabric First' approach and will include the following;

- Increase insulation;
- Reduce the effects of thermal bridging;
- Effective air tightness;
- Improved controlled ventilation; and
- Energy efficient lighting.

5.3 Additional renewable energy generation technology may need to be installed within the development to achieve the required CO_2 emissions targets to meet both current Building Regulations targets and the Councils energy requirements. This can only be developed in more detail as further design and layout information becomes available.

5.4 The water efficiency target of water use per person not to exceed 110 litres per day will be achieved by the installation of efficient fittings that will be determined at detailed design stage and monitored through Building Regulations.

5.5 It is clear from this report that the applicant is aware of modern criteria to ensure the design and built form is environmentally responsible and through this report has committed to a number of potential planning conditions to ensure the detail design, ahead of onsite operations, to enure the scheme meets local criteria.