

## **ENERGY EFFICIENCY REPORT**

### **LOCATION:**

94-Brompton Farm Road, Strood, ME2 3QZ

### **PROPOSAL:**

Demolition of a detached bungalow and Re-Development of 2X 3Bedroom  
Semi detached residential Houses, to include car parking spaces.

## 1-INTRUCTION

Whether it's a new build or a remodel, energy efficient homes are on the rise. There is a need of turning toward energy efficient products, materials and appliances as they build. This is partially due to rising energy costs, but also because of a renewed focus on sustainability and environmentally-responsible building practices. Due to the intense climate changes the LPA's are required to seek information about energy efficiency measures to be in place for the development projects

There are numerous ways to create a more energy efficient home, but not all of them are suited for every climate or house. However the recommendations are made for the new development of 2x3 Bedroom houses site at 94- Brompton Farm road.

There are 6 Main Elements which would be considered at the stage of development of the site. These six must-haves for energy efficient spaces work well in nearly all situations, helping to get closer to a net-zero energy home.

The construction specifications play major role to make a house more energy efficient and environment friendly. The detailed specifications are listed below for the development at 94- Brompton farm road

## 2-CONSTRUCTION SPECIFICAIONS

- 1- Construction of insulated timber / Concrete floor by using adequate thermal insulation
- 2- Construction of external cavity walls and by filling cavity with thermal insulation

- 3- Using appropriate cavity closers to create the airtight construction
- 4- Double glazed UPvc doors and windows to achieve value nearest to 2.8 W/m<sup>2</sup>K.
- 5- Insulated floors at upper levels
- 6- Insulated loft and roof spaces
- 7- Water tight construction of the roof
- 8- Usage of insulated or thermal boards for wall finishes to minimise the heat losses

### 3- SEVEN ELEMENTS TO MEET DEVELOPMENT EMISSION RATES

#### a. High Performance Insulation

Using [high performance insulation](#), like the extruded polystyrene insulation made by Kingspan or Other Manufacturer, can help lower energy bills and make your home more comfortable at the same time. Adding insulation to walls and roofing can help keep what energy you're using right where you want it (and not flowing out the door).

#### b. Insulated Ductwork

One of the biggest sources of energy loss when it comes to heating and cooling a home starts right at the delivery system. Leaky, un-insulated ductwork can result in as much as a 20% loss of the energy you use to heat and cool your home.

By using pre-insulated ducts, can prevent this kind of energy loss, which means all of the energy you use will reach its destination. And your HVAC

system won't be as overworked, which can also result in fewer maintenance costs and reduce a loss of efficiency over time, as well.

### **c. Tight Building Envelope**

Air infiltration and heat transfer have been identified as the biggest sources of energy loss in the home. As much as 40% of the energy you use to heat and cool your home could be lost due to a poorly constructed building envelope.

When there are gaps at the studs or joints in the building, insulation, or sheathing, energy can flow out of the home. At the same time, air can infiltrate your home from the outside as well, which means your heating and cooling systems need to work harder to maintain an even temperature.

By creating a tight building envelope, either by using continuous insulation or by identifying and sealing those cracks, you help prevent significant energy loss. That translates into savings on your energy bills each month, and helps to ensure a truly energy efficient home.

### **d. Moisture Management**

One of the components of creating a tight building envelope is to ensure good moisture management throughout the exterior of the home.

**Moisture Management** plays two roles for the home. First, it helps prevent water from infiltrating the home due to rain, wind and ice. Moisture management will also help prevent condensation and moisture from building up inside the home.

When there is no air infiltration, the differences in temperature and humidity between the interior and exterior of the home may lead to condensation

and moisture build up in the interior walls. Over time, this can lead to problems like wood rot and mold growth. So, when creating an energy efficient home with a tight building envelope, it is equally important to implement a moisture management system through the use of continuous foam sheathing or a vapour permeable weather resistant barrier.

## **e. Lighting**

Lighting is also one of the biggest sources of energy usage in the home. Natural light should be used whenever possible, and a home design should incorporate plenty of options for day lighting.

For artificial lighting, using LED light fixtures can help you reduce your energy usage by up to \$300 each year when replacing standard incandescent bulbs and fixtures.

## **f. Energy Saving Appliances**

Never underestimate how much switching to energy saving appliances throughout the home can save you, too. Any appliance that gets regular use, from kitchen appliances to hot water heaters to HVAC systems, come in several grades of efficiency.

Choosing both the right size appliance and selecting a model rated for efficiency will produce a significant reduction in energy usage in the home each year.

### Recommendations

- 1- It would be preferred to use the electric boilers and cookers to eliminate the usage of gas consumption and reduce the Co2 Emissions

- 2- Provision of Electric Vehicle Charging points for each dwelling house to reduce the usage of Fossil fuels and Co2 emissions in the external environment
- 3- The architectural design incorporates adequate provision of openings , which makes the dwelling more energy efficient by usage of direct sunlight through windows , thus lowering the usage of the electricity during day times

### **g. Creation of More Efficient Living Space**

The living spaces would be more efficient in terms of heat losses, achieving daylight / sunlight.

These factors would be considered and implemented at the time of development to make the development Energy Efficient and sustainable in terms of costs and environment.

## **4-Regulation 25A**

### **Building Regulations 2010**

#### **Consideration of High-Efficiency Alternative Energy Systems**

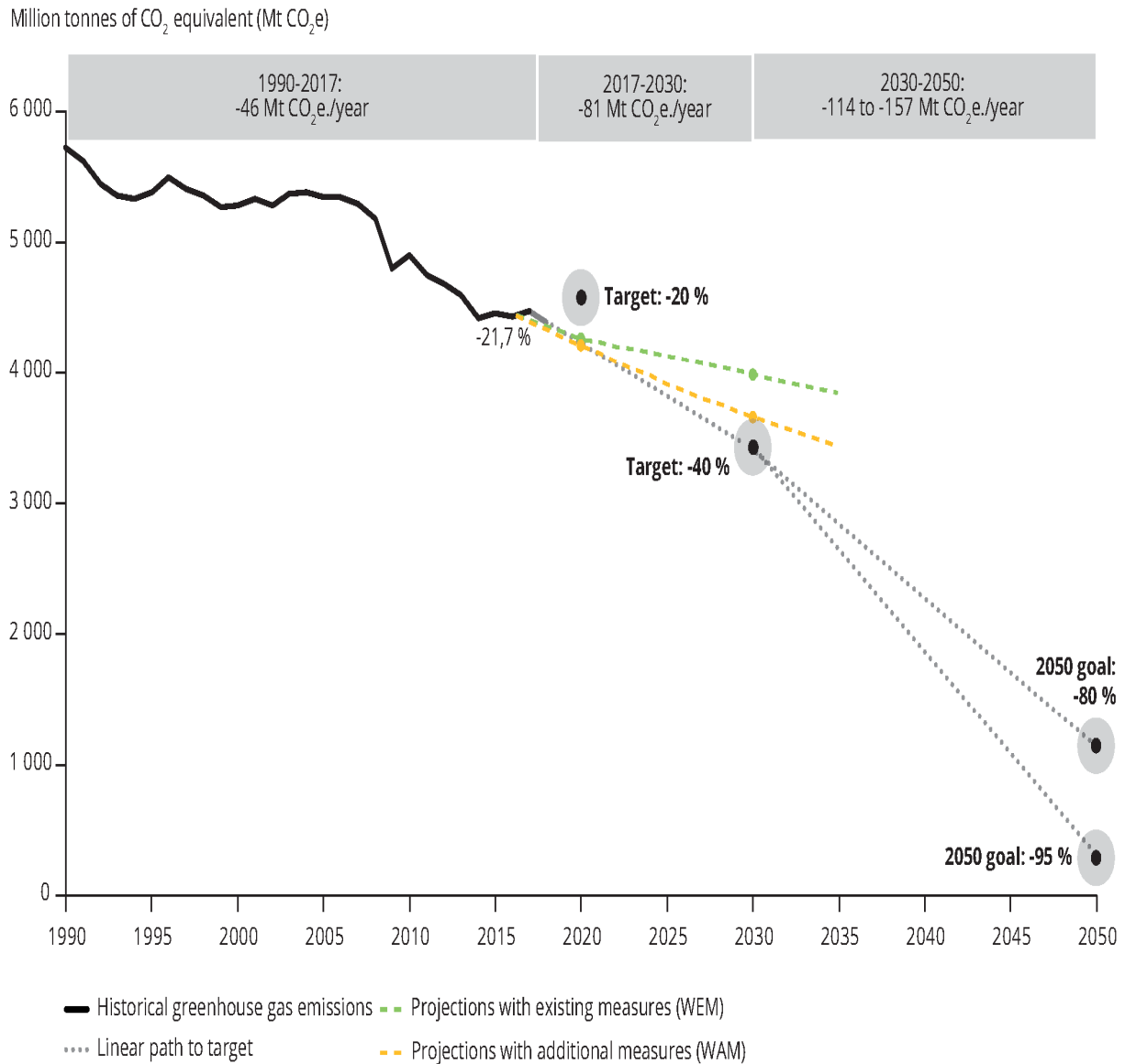
Regulation 25A of the Building Regulations requires that, before work starts, the person undertaking the work must carry out an analysis that considers the use of high-efficiency alternative energy systems in the building's design and must give the local authority notice that this has been undertaken.

Analysis of the a building as energy efficient development is estimated through Carbon Dioxide Emissions due to the usage of materials , techniques , management and appliances.

It is a requirement for the analysis that " Target Emission Rates" for the new building can be met by several ways.

The Dwelling Emission Rate (DER) and the Target Emission Rate (TER) are the headline CO<sub>2</sub> figures which **SAP Calculations** measure. These figures will

determine whether a new dwelling passes or fails on its carbon emission targets set within Part L1A of the building regulations 2010.



**Building regulation 25 A sets the target of 20 % Reduction to Co2 Emissions to make homes more energy efficient and sustainable.**

## 5-CONCLUSIONS & RECOMMENDATIONS

*It is recommended to use the detailed specifications and measures given in the above report during the construction process. It is being projected that the usage of recommended materials and techniques can bring Energy Efficiency Level of Energy Performance within Band "B" and SAP Calculation Points above 81.*

*The UK's EPC Band Ratings are given below*

- EPC rating A = 92-100 SAP points (most **efficient**)
- **EPC rating B = 81-91 SAP points.**
- EPC rating C = 69-80 SAP points.
- EPC rating D = 55-68 SAP points.
- EPC rating E = 39-54 SAP points.
- EPC rating F = 21-38 SAP points.
- EPC rating G = 1-20 SAP points (least **efficient**)

