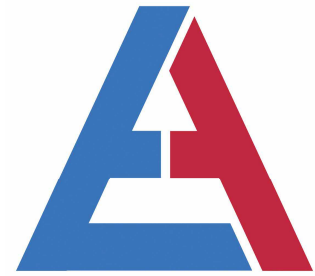


Our REF D3ARC-7054-23
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Energy Statement for a New Dwelling at The Workshop, Carnon Crescent, Carnon Downs Planning Policy SEC1

Executive Summary

This Energy Statement and its attached documents has been prepared in support of a planning application for the proposed new Dwelling at The Workshop, Carnon Crescent, Carnon Downs. This statement includes an energy demand assessment illustrating how selected energy efficiency, low carbon and renewable energy measures have been considered and deemed appropriate for the scheme.

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1. Introduction

Energy Access was formed in May 2006 and has evolved significantly during this period of time, to become a market leader in the South West within their field.

Primarily the core business of Energy Access is On Construction Domestic Energy Assessments (SAPs), Energy Performance Certificates (EPCs) and Air Tightness/Pressure testing and the Code for Sustainable Homes.

Qualifications held by Energy Access include a Fellowship of the Royal Charter of Building Engineers (CABE), On Construction Domestic Energy Assessors (Elmhurst), members of The Air Tightness Testing and Measurement Association (ATTMA) & Code for Sustainable Homes Assessor through Stroma.

2. Planning Policy

Policy SEC1 Part 2b states that The Climate Emergency DPD will Guide Cornwall Council in addressing climate change within planning decisions. Policy SEC1 Sustainable Energy and Construction Part 2b focusses on the energy use of new-build homes in a drive towards net zero operational demand. In Summary, the three elements of this are

- A) a space heating energy threshold – 30kWh/m²/year
- B) a total energy threshold – 40kWh/m²/year
- C) a renewable energy requirement – equal or greater than the total energy demand

3. Executive Summary

We have been commissioned by the D3 Architects to assist with the proposed Development of a new dwelling at The Workshop, Carnon Crescent, Carnon Downs in calculating and documenting the energy efficiency of the proposed development in support of a Planning Application. This statement includes an energy demand assessment showing how selected energy efficiency, low

carbon and renewable energy measures have been considered and those deemed most appropriate for the development.

SAP calculations have been used to show compliance with the Planning requirement for Policy SEC1. These have been prepared for the development based upon the construction specification listed in this report either enclosed or annexed herein.

In accordance with CEDPD Policy SEC1, the data from the SAP calculations were inputted into the required tool (Energy Summary Tool SAP) and below are the findings

CEDPD Policy SEC1	Space Heating Demand kWh/m ² /year	Total Energy Use kWh/m ² /year	Renewable Energy Generation kWh/m ² /year
The Workshop	31.5	53.6	55.9
Compliance	Fail	Fail	Pass

4. Sustainable Energy Strategy

4.1 Passive Design

The Energy performance of a building is affected by its design, construction, use - whilst the occupant behaviour exceeds the remit of this report. In the first instance the design team has provided a very well insulated building fabric to actually reduce the energy needed to condition the environment thus reducing the heat loss and therefore the use of energy in the form of space heating. This “fabric first” approach is highly recommended in today's construction methodology along the lines of the Passive Design principle.

The following U values have been proposed for the dwelling

- The floor will achieve a U value of 0.13W/m²k
- The walls will achieve a U value 0.16W/m²k
- The vaulted roofs will achieve a U value of 0.15W/m²k

- The windows will be high quality double glazed units with an average U value of 1.2W/m²k
- A target air permeability rate will be 2.50 AP50
- Thermal bridging values (PSI) have been based upon independently assessed enhanced values for the R-Wall system
- A MVHR (Mechanical Ventilation and Heat Recovery Unit) will be used within the dwelling
- An Air Source heat pump will be used to condition the internal environment of the development.
- Low energy lighting installed throughout the project

The dwelling has also been oriented to make the most (as the site permits) of the useful solar gains possible from its environment, with openings to capture the day and evening sun and fill the house with positive solar gains. Adopting the “Passive House” standards the high levels of insulation to the fabric along with the positive solar gains, will actually mean that the Building should require little heating throughout the year.

Furthermore, the high levels of insulation will help retain heat and release it back into the dwelling. This will greatly assist the “passive” heating of the dwelling and further reduce the requirement of the heating system and therefore reduce the CO₂ load.

With regards to the M&E, I would confirm that on this particular build a Low and zero carbon feasibility assessment with regards to high efficiency alternative heating systems for the development has been carried out

The developer has incorporated low and zero technology in this dwelling in the form of an air source heat pump to condition the internal environment.

Items such as wind and hydro were dismissed on the grounds of applicability for the location.

Solar thermal was investigated, but the returns were not high enough to make it viable.

The most logical solution alternative, was to provide a PV array to the house which would give a better reduction in CO₂, and this has also been adopted by the developer within the design.



4.2 Overheating Mitigation

Approved Document O of the Building Regulations stipulates the requirements that every new dwelling must be subject to and pass an overheating assessment.

In this instance an assessment has been carried out for the development and is enclosed. This confirms that the development passes the requirements and therefore the amount of glazing proposed is acceptable.

4.3 Water Efficiency Measures

Sanitary appliances and whitegoods have not been specified at this early stage of the project. Therefore for the purposes of this assessment, water efficiency has been deemed as meeting the requirements.

Rainwater harvesting will be used in the development, in the form of water butts with the purpose of external irrigation.

5. Energy Efficiency

The proposed scheme has been thermally modelled and assessed within the SAP software (output sheets enclosed) which compares the proposed dwellings performance against a minimum set of targets that are set by the Building Regulations standards. The results have been used as a means of determining the energy target and dwelling results using the approved modelling software Elmhurst SAP 10.

5.1 Space Heating Demand

On the basis of the aforementioned specification, when the out put figures are inputted in to the Councils SAP Energy Summary Tool, it achieves the following result

CEDPD Policy SEC1	Space Heating Demand kWh/m ² /year
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The Workshop

31.5

Compliance

Fail

The ultimate goal is to reduce the total energy demand of the proposed development. In this instance the total space heating demand is marginally higher than the 30 kWh/m²/year and so the scheme technically fails to comply with the Councils requirement on this individual aspect, however the non compliant heating demand does not prevent the building from being low energy use and achieving the net zero carbon threshold.

5.2 Total Energy Use

With the air source heat pump as the primary heating system, when the output figures are inputted in to the Councils SAP Energy Summary Tool, it achieves the following result

CEDPD Policy SEC1	Total Energy Use kWh/m ² /year
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The Workshop

53.6

Compliance

Fail

As the results are more than 40 kWh/m²/year then the scheme fails to comply with the Councils requirement.

Again, the non compliant Energy Use does not prevent the building from being low energy use and achieving the net zero carbon threshold.

5.3 Renewable Generation

A 3.6kW PV array will be provided to the development in order to generate electric within the dwelling. On this basis, when the output figures are inputted in to the Councils SAP Energy Summary Tool, it achieves the following result

CEDPD Policy SEC1	Renewable Energy Generation kWh/m2/year
The Workshop	55.9
Compliance	Pass

Compliance has been shown without the use of energy storage however this may be something that is considered either by the client or end user and will only further improve the scheme.

5.4 Energy Summary Tool Worksheet

CEDPD Policy SEC1	Space Heating Demand kWh/m2/year	Total Energy Use kWh/m2/year	Renewable Energy Generation kWh/m2/year
The Workshop	31.5	53.6	55.9
Compliance	Fail	Fail	Pass



6. Conclusion

In conclusion, it has been demonstrated that this development will be highly efficient (both passively and through the low and zero carbon M&E) to the location and significantly benefit its environment.

On small dwellings it is particularly prevalent to fail and I have raised this with the Council and they commented as follows

“12.22 We recognise that particularly small homes may find it hard to meet the requirements for technical reasons. In these cases we will be seeking for the development to make all reasonable endeavours towards the requirements. On small properties it is typically technically possible to achieve very good air tightness, efficient fabric, a through-the-wall mechanical heat ventilation with recovery unit, small heat pump and solar PV on suitable surfaces...”

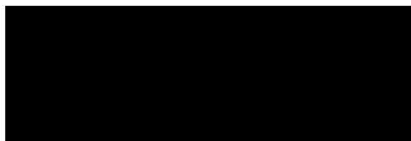
We have seen annexe applicants who have struggled with the total energy but are able to match that figure with solar pv including providing it on the main house where the annexe hasn't got enough suitable roof.

On that basis, the scheme has demonstrated to satisfy that criteria of the Policy SEC1 Part 2b of The Climate Emergency DPD

No off-set payment is considered needed for this development as the renewable energy generation target has been met.

I trust the above and enclosed gives a coherent perspective of the likely environmental impact of this property.

Kind Regards



Stuart Thomas BSc(Hons) C.Build E FCAB



Enclosures

- *SAP Design calculation output sheets*
- *Policy SEC1 Calculations - energy-summary-tool-sap*

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