Tudor Inn
Cimla

Energy Strategy Statement

Project Ref: 2617

August 2024

Revision: -

Architecture
Low Energy Consultancy
Civil Engineering
Structural Engineering
Urban Design

Contents

Section 1: Introduction

1.1 Introduction

This **Energy Strategy Statement** has been prepared by Spring Design to support the delivery of 22 new dwellings by Tai Tarian the following development site:

Tudor Inn
Cimla
Neath Port Talbot

This document establishes the current legislative context as it pertains to energy and discusses the proposals through the lenses of 3.1 Site Layout & Orientation; 3.2 Heat Loss Form Factor; 3.3 Glazing Quantity, Distribution & Shading, 3.4 Building Fabric, 3.5 Mechanical Services and 3.6 Overheating.

Section 2: Context

2.1 Planning Policy Wales - Edition 12

Welsh Government have enshrined the route to decarbonisation of housing within planning policy, dedicating sections of Planning Policy Wales - Edition 12 (2024) to the discussion of strategic approaches for sustainable development in Wales.

Key policies established include the Energy Hierarchy for Planning (Figure 1) which clearly prioritises the reduction in energy demand above energy efficiency and renewable energy generation. This is considered critical in supporting a divestment of fossil fuels and uptake of electric power, particularly with the growing use of electric vehicles and heat pumps.

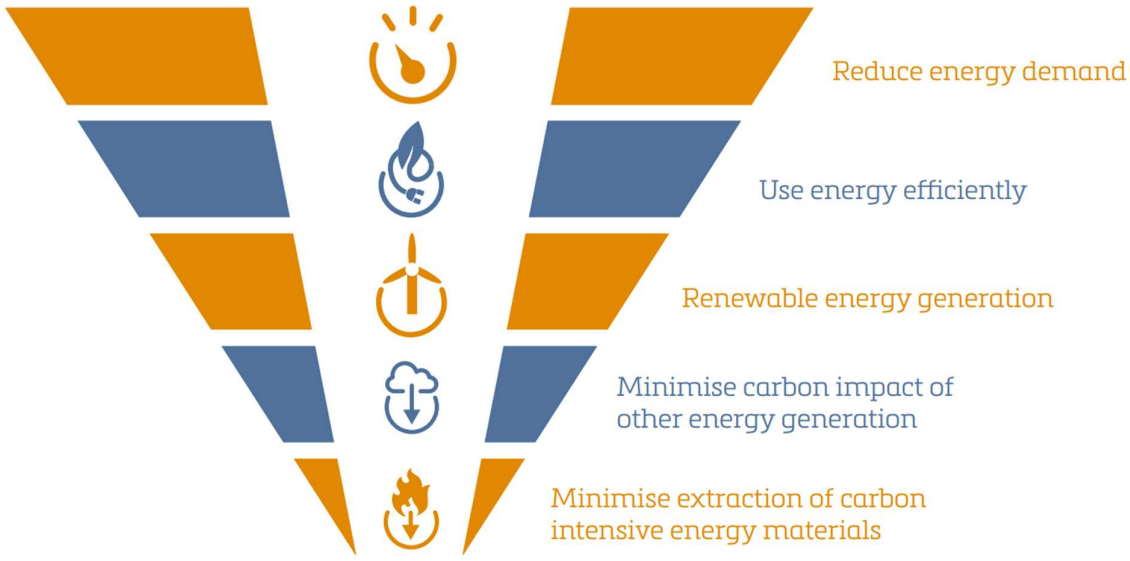


Figure 1: Planning Policy Wales - Edition 12 (2024) - Energy Hierarchy for Planning

In response to this requirement for a reduction in energy demand the planning system is required to support development that can demonstrate low embodied carbon and low operational energy demand. It follows that proposals should evidence procedures for the minimisation of whole life emissions associated with their location, design, construction, use and eventual demolition. Strategies to deliver decarbonisation, mitigation for climate change and built-in climate resilience should also be considered positively.

Proposals developed for planning must consider the implications of revisions and changes to Building Regulations requiring enhanced standards of carbon reduction in new buildings.

Excerpts from the relevant sections of the policy document are supplied for reference within 5.1 Planning Policy Wales - Edition 12.

2.2 Welsh Development Quality Requirements 2021

Building upon Planning Policy Wales - Edition 11 (2021) the Welsh Development Quality Requirements 2021 (WDQR 2021) sets clear aspirations for the decarbonisation of new build social housing.

WDQR 2021 requires consideration of whole-life carbon and strategies for a reduction of both embodied and operational carbon. This is supported by recommending assessment of the reuse potential of existing buildings, specification of reused and recycled materials and ensuring buildings are designed so at the end of their operational life they can be adapted, reused or - embracing circular economy principles - deconstructed with recovered materials re-used or recycled. The reduction of operational energy demand is again prioritised: on-site renewables are recommended as a complementary strategy where they would be appropriate for the development.

A minimum EPC A (SAP 92+) must be achieved for dwellings without the use of fossil fuel appliances to deliver heating and hot water. In attaining EPC A, dwelling fabric standards must align with those defined within Table E1 Elemental Specification of Approved Document L Volume 1: Dwellings (2022) (Figure 2). Alternative proposals are considered acceptable where they can demonstrate energy demand has been reduced.

Assessment of climate resilience, in the form of protection against overheating, is also mandated for all apartments and those dwelling houses without windows in two parallel aspects. Dwellings falling into this definition must undertake dynamic thermal modelling through CIBSE TM59 assessment as a 'Category 1 building.' Where a dwelling house is provided operable windows in two parallel aspects, it is assumed to have adequate provision of cross-ventilation to mitigate the potential for overheating.

Excerpts from the relevant sections of the policy document are supplied for reference within 6.2 Welsh Development Quality Requirements 2021.

2.3 Approved Documents F, L & O

The Approved Documents provide guidance on how to comply with each aspect of the Building Regulations, periodically revised to respond to perceived issues and to reflect the evolving knowledgebase. Both Approved Document F Volume 1: Dwellings (Wales) 2022 and Approved Document L Volume 1: Dwellings (Wales) 2022 have been revised to reflect improved energy efficiency targets and augmented by the introduction of the additional Approved Document O: Overheating (Wales) 2022 to build in climate resilience.

Approved Document F Volume 1: Dwellings (Wales) 2022 has been refined to simplify guidance in relation to ventilation provisions. The document exists to ensure dwellings are provided an adequate supply of fresh air, sufficient extraction from rooms where water vapour or pollutants are likely to be generated and purge ventilation to remove high concentrations of pollutants and water vapour. This provision can be achieved through natural ventilation, mechanical ventilation or a combination of the two systems.

The requirements and rates are not significantly different from those established within the superseded 2010 document but do clarify purge ventilation is likely to be exceeded by the requirements of AD O (Wales) 2022: the greater figure should always be the design target.

Approved Document L Volume 1: Dwellings (Wales) 2022 aims to deliver c. 30% reduction in CO_2 emissions versus 2014 regulations by promoting more energy efficient dwellings. An additional metric is introduced, target primary energy rate (TPER), combining: energy demand of the dwelling; efficiency of the heat delivery system; carbon intensity of the generation and distribution of the chosen fuel source.

The document mandates all new build dwellings must achieve a minimum EPC B (SAP 81+) and demonstrate a dwelling emission rate (DER) at or below the target emission rate (TER) plus dwelling primary energy rate (DPER) at or below the target primary energy rate (TPER). Revised fabric u-values are defined within Table E1 Elemental Specification (Figure 2) and present an improvement on the superseded document.

Table E1 Elemental Specification

Element or system	Specification
Opening areas (windows and doors)	Same as actual dwelling up to a maximum proportion of 25% of total floor area [1]
External Wall U-value (W/m²K)	0.13
Corridor Wall U-value (W/m²K)	0.18
Party Wall U-value (W/m²K)	0
Roof U-value (W/m²K)	0.11
Floor U-value (W/m²K)	0.11
Windows, Roof Windows and Glazed Door U-value (W/m²K)	1.3 (whole window u-value)
Rooflight U-value (W/m²K)	1.6 (whole window u-value)
Windows, Roof Windows, Glazed Rooflights and Glazed Door g-value	0.63 [3]
Opaque and Semi-glazed Door U-value (W/m²K)	1.0

Figure 2: Excerpt from Approved Document L Volume 1: Dwellings (Wales) 2022 - Table E1 Elemental Specification

Thermal bridges are dealt with more punitively with default values significantly increased to incentivise better detailing of junctions supported by bespoke psi value calculations.

Approved Document O: Overheating (Wales) 2022 has been introduced to address climate resilience, building in strategies to deal with the increased frequency of heatwaves. While basic in this edition, it develops criteria to mitigate the overheating potential of dwellings.

Where dwelling houses demonstrate compliance with AD F (Wales) 2022 and have operable windows in two parallel aspects it is assumed to have adequate cross-ventilation provision. All apartments and those dwelling houses without operable windows in two parallel aspects must either demonstrate compliance with the simplified method (Figure 3) or undertake dynamic thermal modelling through CIBSE TM59 assessment as a 'Category 1 building.'

Mitigation approach	Minimising summer solar gains	Heat removal (Openable windows[1] and ventilation louvers)
Single aspect residential buildings		
Approach S1	Maximum glazed area of 15% of floor area	Minimum free area of 12% of floor area
Approach S2	Maximum glazed area of 20% of floor area Glazing with a maximum g-value of 0.4.	Minimum free area of 10% of floor area
Dual aspect residential buildings		
Approach D1	Maximum glazed area of 15% of floor area	Minimum free area of 12% of floor area
Approach D2	Maximum glazed area of 35% of floor area Glazing with a maximum g-value of 0.4.	Minimum free area of 12% of floor area
Approach D3	Maximum glazed area of 35% of floor area External shutters with means of ventilation on all facades. Overhangs with 50° altitude cut-off can be used instead of external shutters on south façades*. * i.e. walls with a south east to south west facing orientation	Minimum free area of 12% of floor area
Note: [1] When calculating the free area for heat removal on hinged or pivot windows, for calculation purposes, the maximum opening angle that is practical and safe to achieve can be used, however, with a limit of 60°.		

Figure 3: Excerpt of the simplified method from AD O: Overheating (Wales) 2022 - Controlling overheating by minimising summer solar gains and heat removal

Section 3: Proposals

3.1 Site Layout & Orientation

The site layout (Figure 4) prioritises the provision of broadly North-South oriented dwellings. Blocks and terraces are well spaced to reduce incidental shading of the low winter sun and individual dwellings step down with the topography to reduce their impact as shading objects to more northerly properties.

Tudor Inn represents a triangular parcel of land that tapers in width towards the West. It measures 0.77 ha (1.92 acres) and is currently unoccupied. Located immediately South-West of the village of Cimla, the site runs parallel with Beacons View and is currently accessed from Cae Rhys Ddu via the access to the former public house.

Figure 4: Excerpt from 2617-00(03)100E - Site Layout

3.2 Heat Loss Form Factor

Heat loss form factor is a relative measure establishing the ratio of internal heated volume to external surface area, i.e. surfaces through which heat will be lost. This be used as an indicator for the efficiency of the dwelling: a lower form factor means there will be less opportunity for heat loss through the fabric.

The proposed units are two storey dwelling houses or walk-up flats and three storey common access flats. Detached units effectively increase form factor, but most dwellings are configured as either semi-detached or terraced to reduce form factor and therefore increase the latent energy efficiency. This represents a cost and material effective method of reducing heat demand that aligns with policy directives.

3.3 Glazing Quantity, Distribution & Shading

Every habitable room is provided at least one operable window, and every dwelling unit achieve operable windows in parallel elevations. The fenestration hierarchy proposes the largest windows to living rooms and bedrooms with opening sizes reducing in kitchens and bathrooms to account for necessarily higher sills.

Wherever possible, these habitable rooms are designed to have a southerly orientation; however, to establish flexibility in the unit deployment there is at least one large window in each opposite elevation to account for either a North or South-facing position. Implications on heat loss and solar gain can be mitigated with a sufficiently robust glazing strategy.

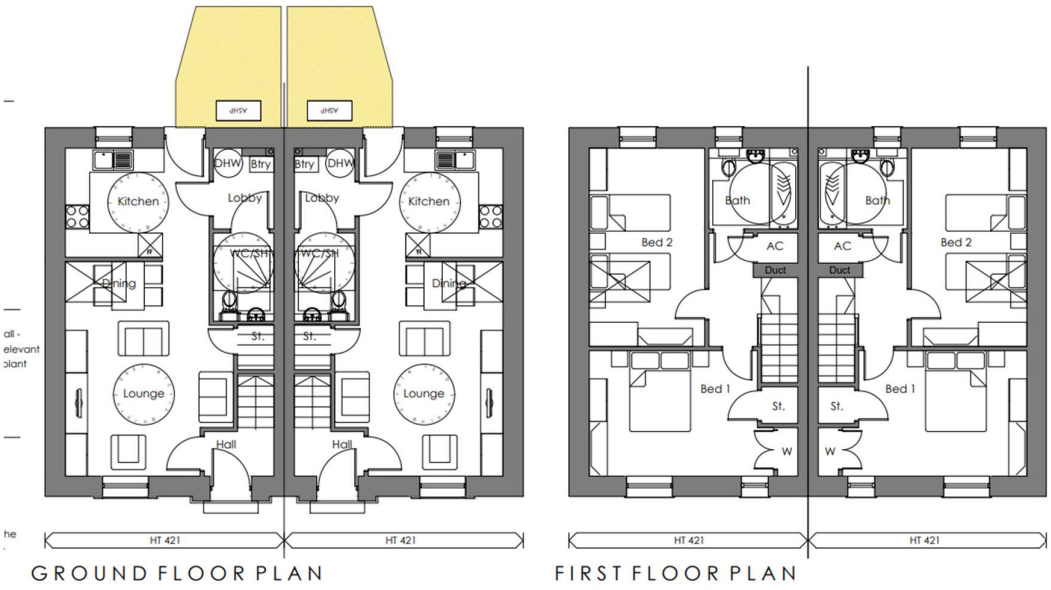


Figure 5: Excerpt from 2617-421(03)200 - Plans & Elevations 421

Figure 6: Excerpt from 2695-421(03)300 - Plans & Elevations 421

3.4 Building Fabric

The fabric will achieve at least that defined by Approved Document L Volume 1: Dwellings (2022) Table E1 Elemental Specification (Figure 2).

3.5 Mechanical Services

Proposals for mechanical services are strategic to inform spatial coordination and planning and require specialist subconsultant input to fix the mechanical plant specification.

The fabric specification of the dwellings reduces heating demand to lower the necessary input from building services. Aligning with Welsh Government's Energy Hierarchy, these have been designed to first prioritise a reduction in heating demand - where mechanical systems can contribute to the fact - then the efficient use of energy, then aim for on-site renewable energy generation.

Heating and hot water for the houses are to be met by electrically powered heat pump technologies. Heat pumps convert delivered electrical energy into useful heat output at a rate of 300%+ efficiency via the calculated (seasonal) coefficient of performance (SCOP/ COP). Air source heat pumps (ASHPs) are the preferred solution due to the flexibility of its application and no requirement for boreholes or substantial excavations versus the alternative ground source heat pumps (GSHPs).

Each house will be equipped with low flow radiators throughout to capitalise on the high efficiency output of the ASHP. Using low flow emitters with increased surface areas allows the use of lower radiant temperatures, improving the effective Coefficient of Performance (COP) to deliver affordable warmth to the homes. Well insulated hot water cylinders will also be provided to efficiently store the domestic hot water needs generated by the ASHP.

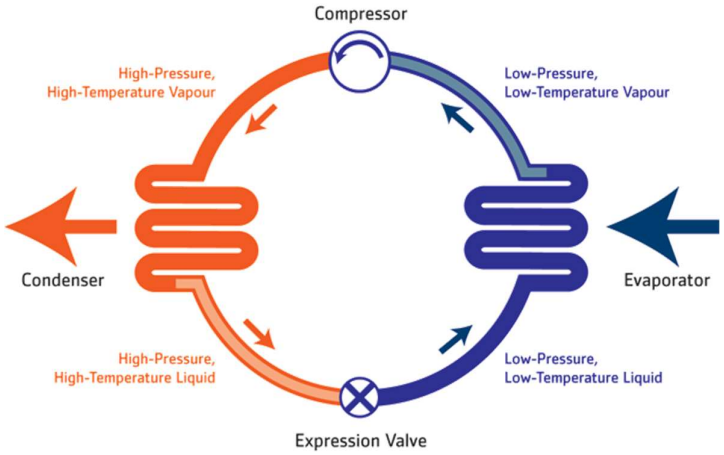


Figure 7: Diagram illustrating principle of heat exchange used in heat pumps, property of Carmichael Browns

These high-efficiency, electrically powered heating systems are appropriate fossil fuel alternatives that contribute to the decarbonisation of dwellings and a significant reduction in primary energy demand.

Flats will be provided with integrated heat pump cylinders for the provision of hot water and electric panel heaters for space heating.

Photovoltaic panels are proposed on appropriately oriented roof slopes for the social housing provision with planning secured for photovoltaics on the market dwellings should purchasers wish to invest in this technology. On-site renewable provisions reduce occupant energy demand from the grid which can be further augmented by on-site energy storage - electrical or phase-changing heat batteries, smart cylinders - to enable peak production (midday) to directly benefit peak demand (evenings). Interlinked systems can enable occupants benefit from photovoltaic production even if absent during peak production.

All units will achieve EPC A.

3.6 Overheating

All dwelling houses have been designed to feature operable windows in parallel elevations to comply with the requirements of Approved Document O: Overheating (Wales) 2022. This has been informed by client preference aligning with the policy requirement to prioritise passive means of cooling rather than introducing active mechanical systems.

Approved Document O: Overheating (2022) requires all flats and those dwellings without windows in parallel elevations to undergo CIBSE TM59: Design methodology for the assessment of overheating risk in homes (2017). This analysis will be necessary for the flats within HT 211 and HT 212.

Section 4: Summary

This **Energy Strategy Statement** has established the legislative context of the proposals and described the fabric first methodology that has informed their development.

Through alignment with the aspirations of Welsh Government - communicated through Planning Policy Wales - Edition 12 (2024), Approved Document F Volume 1: Dwellings (Wales) 2022, Approved Document L Volume 1: Dwellings (Wales) 2022 and Approved Document O: Overheating (Wales) 2022 - Tudor Inn proposes energy efficient, decarbonised homes that will achieve EPC A (SAP 92+) and a meaningful reduction in heating demand as the priority defined by Welsh Government's Energy Hierarchy for Planning.

Section 5: Appendix

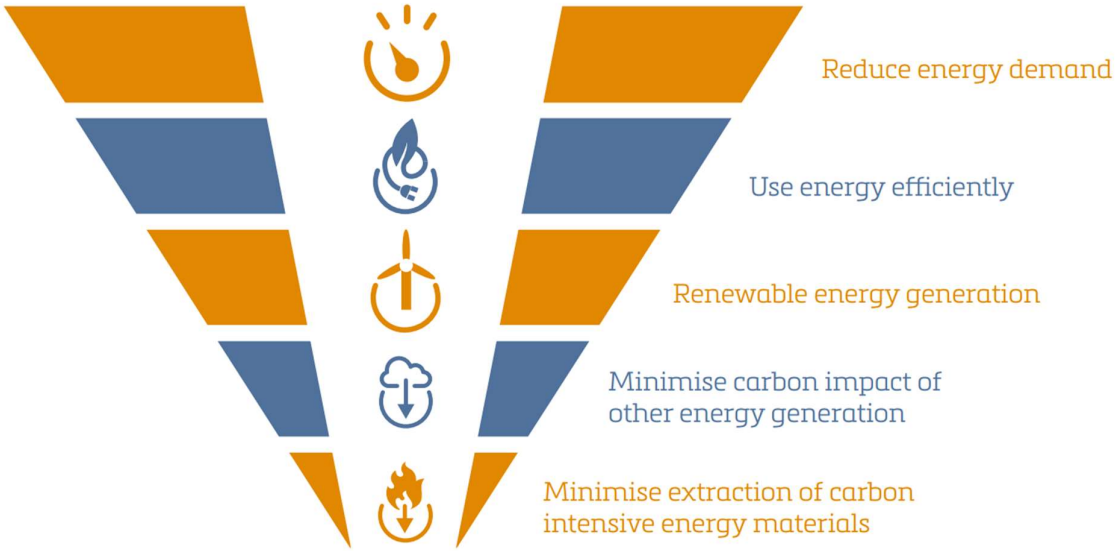
5.1 Planning Policy Wales - Edition 12

Excerpts from pages 93-95.

Energy Hierarchy for Planning

5.7.13 Welsh Government planning policy recognises an energy hierarchy. The Welsh Government expects all new development to mitigate the causes of climate change in accordance with the energy hierarchy for planning, as set out in the following energy policies. Reducing energy demand and increasing energy efficiency, through the location and design of new development, will assist in meeting energy demand with renewable and low carbon sources. This is particularly important in supporting the electrification of energy use, such as the growing use of electric vehicles and heat pumps. All aspects of the energy hierarchy have their part to play, simultaneously, in helping meet decarbonisation and renewable energy targets.

Figure 10: The Energy Hierarchy for Planning



[…]

Reduce Energy Demand and Use of Energy Efficiency

5.8 Sustainable Buildings

5.8.1 The planning system should support new development that has very high energy performance, supports decarbonisation, tackles the causes of the climate emergency, and adapts to the current and future effects of climate change through the incorporation of effective mitigation and adaptation measures.

5.8.2 The Welsh Government's policy is to secure zero carbon buildings while continuing to promote a range of low and zero carbon technologies as a means to achieve this.

5.8.3 Sustainable building design principles should be integral to the design of new development. Development proposals should:

• mitigate the causes of climate change, by minimising carbon and other greenhouse gas emissions associated with the development's location, design, construction, use and eventual demolition; and
• include features that provide effective adaptation to, and resilience against, the current and predicted future effects of climate change.

5.8.4 In order to further promote energy efficiency and energy conservation, planning authorities should consider including development plan policies requiring applications for major development to be accompanied by an Energy Report. This independent report should include recommendations to the developer relating to energy efficiency and appropriate renewable energy technologies that could be incorporated into the development. A response to that report from the developer should also accompany the application. If planning authorities feel that insufficient consideration has been given to energy issues in project design, they may refuse planning permission.

5.8.5 Planning authorities should assess strategic sites to identify opportunities to require higher sustainable building standards, including zero carbon, in their development plan. In bringing forward standards higher than the national minimum, which is set out in Building Regulations, planning authorities should ensure the proposed approach is based on robust evidence and has taken into account the economic viability of the scheme.

5.8.6 TAN 12: Design and Practice Guidance: Planning for Sustainable Buildings provide guidance on sustainable building design. Design and Access Statements should show how sustainable building design principles have been considered in the design process.

5.8.7 Developers should take into account future requirements for carbon reduction in new buildings when designing their schemes, as a result of changes to Building Regulations in Wales; being mindful of any future changes will ensure design aspects of requirements are considered as early as possible.

5.2 Welsh Development Quality Requirements 2021

Excerpts from pages 2-3.

1. Homes should be of high quality, innovative and sustainable

[…]

c) Adopt best practice in moving to a decarbonised and circular built environment by considering:

• Assessing and reducing upfront and embodied carbon during the design and construction phases, and when undertaking refurbishment.
• Evaluating the potential for reuse of existing buildings, specifying reused and recycled materials and ensuring that buildings can be adapted, reused or deconstructed and recovered materials re-used or recycled at end of life.
• Maximising the efficient use of timber in construction to increase carbon storage in harvested wood products in Wales.
• Minimising operational carbon by reducing operational energy demand and where appropriate, using on site renewables.
• Ensuring there is sufficient provision for the collection of key recyclables and storage of food waste in homes.
• Undertaking as-built assessment of whole life carbon and post occupancy evaluation of the building's performance in relation to the design intent.
• Once upfront, embodied and operational carbon are minimised, using robust offsetting schemes to move to net-zero whole life carbon.

[…]

d) New homes must meet energy and decarbonisation requirements which consists of:

• Achieving EPC A (SAP92 or greater) through the minimum fabric standard set out in "Appendix E" – Elemental specification for the DER/TER, within the Building Regulations Approved Document Part L Wales 2020 and by not using fossil fuel fired boilers to provide domestic hot water and space heating. Alternative proposals will be acceptable where it can be demonstrated by independent certification that the building's energy demand is reduced in accordance with the Energy Hierarchy for Planning in Welsh Government's Planning Policy Wales.
• An assessment of overheating risk based on the CIBSE TM59 methodology (for 'Category 1 buildings'), which demonstrates compliance with the CIBSE TM59 compliance criteria, for the following dwelling types:
o Apartments/Flats.
o Houses which do not have two or more parallel aspects to facilitate cross-ventilation.

5.3 Approved Documents F, L & O

Excerpt from AD F: Dwellings (Wales) 2022 pages 17-19.

Table 1.2 Minimum extract ventilation rates for continuous extract systems(1)

Room	High rate	Continuous rate
Kitchen	13 litres per second	The sum of all extract ventilation in the dwelling on its continuous rate should be at least the whole dwelling ventilation rate given in Table 1.3
Utility room	8 litres per second	
Bathroom	8 litres per second	
Sanitary accommodation	6 litres per second	

Note:
1. If the continuous rate of ventilation provided in a room is equal to or higher than the minimum high rate specified in the table, no extra ventilation is needed.

Whole dwelling ventilation

1.23 Supply air for the dwelling should be delivered through either:

- Continuous supply fans
- Background ventilators

1.24 The minimum whole dwelling ventilation rate for the supply of air to the habitable rooms in a dwelling should meet both of the following conditions:

a. A minimum rate of 0.3 litres per second per m^2 of internal floor area (this includes all floors, e.g. for a two-storey building, add the ground-floor and first-floor areas).
b. A minimum rate determined by the number of bedrooms, as specified in Table 1.3.

Table 1.3 Minimum whole dwelling ventilation rates[1,2]

Number of bedrooms	1	2	3	4	5
Minimum ventilation rate by number of bedrooms (l/s)	19	25	31	37	43

Notes:
1. Where the dwelling has only one habitable room, a minimum ventilation rate of 13 l/s should be used.
2. For each additional bedroom, add 6 litres per second to the values in Table 1.3.

[…]

Table 1.4 Purge ventilation openings

Opening type	Minimum total area of openings
Hinged or pivot windows with an opening angle of 15 to 30 degrees	1/10 of floor area of room
External doors Opening sash windows Hinged or pivot windows with an opening angle of greater than or equal to 30 degrees	1/20 of floor area of room

1.31 Hinged or pivot windows with an opening angle of less than 15 degrees are not suitable for purge ventilation.

Excerpt from AD F: Dwellings (Wales) 2022 page 22.

Table 1.6 Types of ventilation system

System type	Dwellings covered by the guidance
Natural ventilation (paragraphs 1.47 to 1.59)	Less airtight dwellings
Continuous mechanical extract ventilation (paragraphs 1.60 to 1.66)	All dwellings
Mechanical ventilation with heat recovery (paragraphs 1.67 to 1.73)	All dwellings

Note: For situations outside the scope of Table 1.6, expert advice should be sought for the design,sizing and position of ventilators to provide effective ventilation.

Note: As defined in **Appendix A**, less airtight dwellings are dwellings which have one of thefollowing.

a. A design air permeability higher than $5m^3/(h \cdot m^2)$ at 50Pa.

b. An as-built air permeability higher than $3m^3/(h \cdot m^2)$ at 50Pa.

1.46 Where a dwelling has natural ventilation and a measured air permeability that differs from the design air permeability, so that it is defined as a highly airtight dwelling, one of the following applies.

a. Expert advice should be sought.

b. A continuous mechanical extract ventilation system should be installed by following theguidance in paragraphs 1.60 to 1.66.

Note: Continuous mechanical extract ventilation systems are available as decentralised options. An intermittent extract fan may be replaced with a decentralised continuous mechanical extract ventilation system fan.

Excerpts from AD L Volume 1: Dwellings (Wales) 2022 pages 103-105.

Table E1 Elemental Specification

Element or system	Specification
Opening areas (windows and doors)	Same as actual dwelling up to a maximum proportion of 25% of total floor area [1]
External Wall U-value (W/m²K)	0.13
Corridor Wall U-value (W/m²K)	0.18
Party Wall U-value (W/m²K)	0
Roof U-value (W/m²K)	0.11
Floor U-value (W/m²K)	0.11
Windows, Roof Windows and Glazed Door U-value (W/m²K)	1.3 (whole window u-value)
Rooflight U-value (W/m²K)	1.6 (whole window u-value)
Windows, Roof Windows, Glazed Rooflights and Glazed Door g-value	0.63 [3]
Opaque and Semi-glazed Door U-value (W/m²K)	1.0
y-value (W/m²K)	Based on the 'Option 2' psi values in Table R2 of SAP 10.1 except use of y=0.05 W/m² K if the default value of y=0.20 W/m² K is used in the actual building
Ventilation System Type	Intermittent extract fans with trickle vents
Air Permeability (m³/h·m² at 50 Pa)	5
Air Conditioning	None
Heating system	Mains Gas
	If gas or oil combi boiler performing space heating in actual dwelling, instantaneous combi boiler; otherwise regular boiler Low temperature radiators (design flow temperature = 55°C)

Element or system	Specification
	Room sealed Fan flue SEDBUK 2009 89.5% efficient
Space Heating Controls	1. For a single storey dwelling in which the living area is greater than 70% of total floor area, programmer and room thermostat; 2. For any other dwelling, time and temperature zone control, TRVs; And in all cases: Modulating burner control Boiler interlock ErP Class V Heated by boiler (regular or combi as above)
Hot Water System	Separate time control for space and water heating If cylinder specified in actual dwelling: volume of cylinder in actual dwelling If combi boiler: no cylinder Otherwise: 150 litres
	If cylinder, declared loss factor = 0.85 x (0.2 + 0.051 $V^{2/3}$) kWh/day, where V is the volume of the cylinder in litres Cylinder in heated space Thermostat controlled Fully insulated primary pipework
Shower Flow Rate	8 l/min
Waste Water Heat Recovery (WWHR)	Efficiency of 55% Utilisation of 0.98
Secondary Space Heating	None
Fixed Lighting Capacity (lm)	185 x Total Floor Area
Lighting Efficacy (lm/W)	80
Thermal Mass Parameter	Same as actual dwelling
PV System	For houses kWp = 40% of ground floor area, including unheated spaces / 6.5 For flats kWp = 40% of dwelling floor area / (6.5 × number of storeys in block) SE/SW facing, 45° pitch No/very little overshading

Element or system	Specification
[1] The Building Regulations do not specify minimum daylight requirements. However, reducing window area produces conflicting impacts on the predicted CO2 emissions: reduced solar gain but increased use of electric lighting. As a general guide, if the area of glazing is much less than 20 per cent of the total floor area, some parts of the dwelling may experience poor levels of daylight, resulting in increased use of electric lighting. [2] The orientation of the elemental building is the same as the actual building. See SAP 10 Appendix R for treatment of curtain wailing (an allowance of +0.1W/m^{2}K is made on the window U-value for thermal bridging within the curtain wall). The treatment of roof windows is also detailed in SAP 10 Appendix R (an adjustment factor of +0.3W/m^{2}K is applied). [3] Higher g-values would also comply with the recipe as increasing solar gains reduced the space heat load. However, designers should be aware of the impact of g-value on the risk of overheating and optimise their choice accordingly.	

Excerpts from AD O: Overheating (Wales) 2022 pages 10-11.

Table 1.1

Residential building/unit type	Compliance approach
Flats *(including communal areas and communal corridors)*	Paragraph 1.2 to 1.3 should be followed.
Dwelling-houses **with** two or more parallel aspects to facilitate cross-ventilation.	These dwelling types are considered to adequately mitigate the risk of summer overheating when the minimum requirements of Approved Document F and Section 2 of this approved document are achieved. However, if ventilation is restricted due to noise, pollution, safety or security concerns (see Section 2), then paragraphs 1.2 to 1.3 should be followed.
Dwelling-houses **without** two or more parallel aspects to facilitate cross-ventilation.	Paragraph 1.2 to 1.3 should be followed.
Residential (institutional) *(including communal areas and communal corridors)*	Paragraph 1.2 to 1.3 should be followed.
Residential (other) *(including communal areas and communal corridors)*	These residential unit types are considered to adequately mitigate the risk of summer overheating when the minimum requirements of Approved Document F and Section 2 of this approved document are achieved. However, if ventilation is restricted due to noise, pollution, safety or security concerns (see Section 2), then paragraphs 1.2 to 1.3 should be followed.

[…]

Table 1.2 – Controlling overheating by minimising summer solar gains and heat removal

Mitigation approach	Minimising summer solar gains	Heat removal (Openable windows[1] and ventilation louvers)
Single aspect residential buildings		
Approach S1	Maximum glazed area of 15% of floor area	Minimum free area of 12% of floor area
Approach S2	Maximum glazed area of 20% of floor area Glazing with a maximum g-value of 0.4.	Minimum free area of 10% of floor area
Dual aspect residential buildings		
Approach D1	Maximum glazed area of 15% of floor area	Minimum free area of 12% of floor area
Approach D2	Maximum glazed area of 35% of floor area Glazing with a maximum g-value of 0.4.	Minimum free area of 12% of floor area
Approach D3	Maximum glazed area of 35% of floor area External shutters with means of ventilation on all facades. Overhangs with 50° altitude cut-off can be used instead of external shutters on south façades*. * i.e. walls with a south east to south west facing orientation	Minimum free area of 12% of floor area

Note:
[1] When calculating the free area for heat removal on hinged or pivot windows, for calculation purposes, the maximum opening angle that is practical and safe to achieve can be used, however, with a limit of 60°.

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