ENERGY STRATEGY

PROJECT:
Duddery Hill

PROJECT NUMBER:
P2432

DOCUMENT REF:
P2432-ENE-01

Revision	Date	Details	Authored	Checked
R1	22.09.2022	Issued for comment	J. Seager	C. Armstrong

KENT (HQ)
Unit 3 Grove Dairy Farm Business Centre I Bobbing Hill I Bobbing I Sittingbourne I Kent I ME9 8NY

LONDON
One Bridge Wharf I 56 Caledonian Road I London I N1 9UU

CONTENTS

1.0 EXECUTIVE SUMMARY

QuinnRoss Consultants was commissioned to develop an energy assessment for the proposed *Duddery Hill* development that would demonstrate how it will provide heating and power and meet the energy and carbon emission targets set by national, regional, and local policy. The site is located on Haverhill, Suffolk. The development is a new-build storage facility.

This development will be subject to the following requirements:

Requirement	Description / Summary
Building Regulations Part L 2021	New non-domestic buildings must have a Building's Emission Rate (BER) equal to or less than the calculated Target Emissions Rate (TER).
St Edmundsbury Core Strategy (2010)	Highlights details on how to develop the borough in a way that respects the local history, but also in a sustainable manner that enhances the local environment.

Table 1: Summary of energy and sustainability targets

To achieve the above targets, the following energy reduction methods will be implemented:

Method	Description / Summary
Building form	The building form will be optimised to help limit any unnecessary energy use.
High performing building thermal envelope	The construction U-values will perform substantially above the current building regulations.
Low infiltration	Air tightness will be no higher than 5.0 m^3/m^2h.
Daylight strategy	Daylight penetration in rooms will be maximised to reduce lighting demand significantly.
Highly efficient lighting with controls	LED lighting will be installed throughout with daylight and PIR sensors where possible.
Insulated pipe work	All Internal heating pipework will be insulated to a standard beyond building regulation requirements.
Unregulated Energy Use	Efforts will be made to reduce the unregulated emissions by providing "best in class" ("A" rated or equivalent) white goods where applicable.

Table 2: Summary of energy hierarchy Lean, Clean & Green methods

Thermal and Energy Modelling Results

The whole development has been analysed for its energy use using current 2021 Building Regulations, Part L 2021, in approved energy modelling software. The predicted and saved CO_2 is shown below:

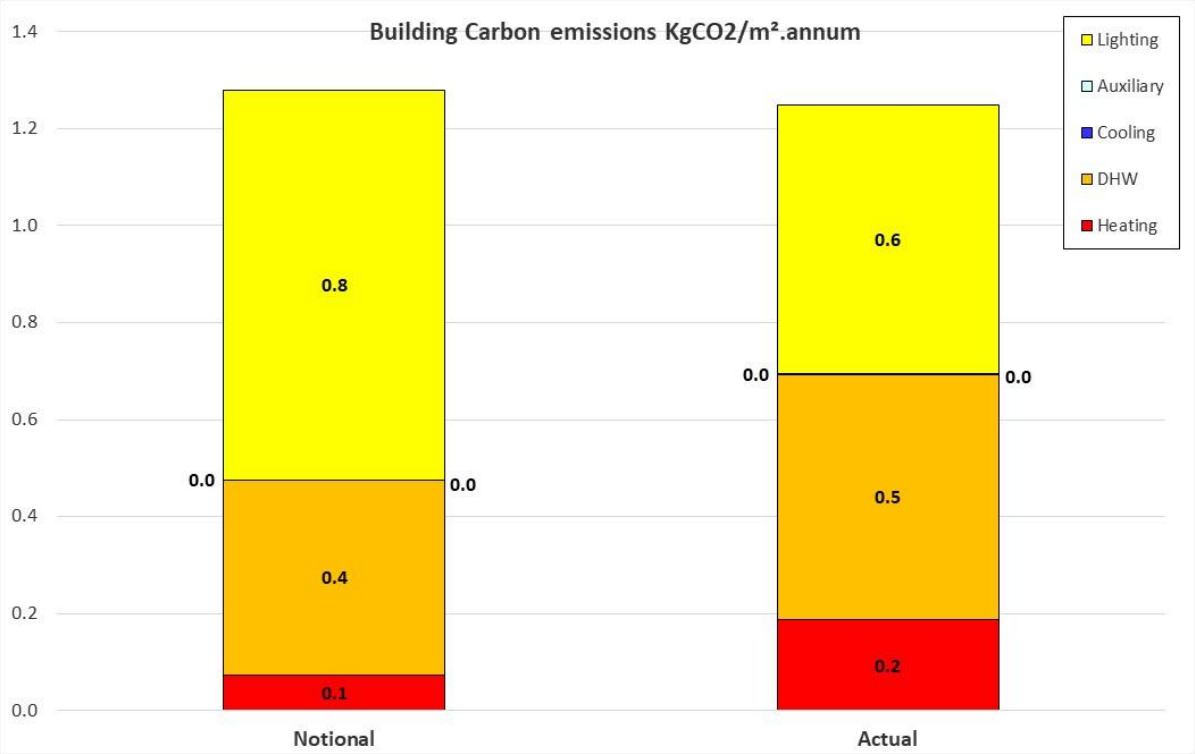


Figure 01: CO_2 reductions compared with the Build Regs target

Current Building Regs using Part L 2021						
	New build commercial (includes major refurbishments assessed under Part L2A)		New build residential (includes major refurbishments assessed under Part L1A)		Overall area weighted reductions	
	Total tCO_2	% Reduction at each stage	Total tCO_2	% Reduction at each stage	Total tCO_2	% Reduction at each stage
Baseline	7	N/A	0	N/A	7	N/A
Be Lean	7	2%	0	0%	7	2%
Be Clean	7	0%	0	0%	7	0%
Be Green	8	-11%	0	0%	8	-11%
TOTAL	**-1**	**-9%**	**0**	**0%**	**-1**	**-9%**

Figure 02: CO_2 reductions compared with the Build Regs target

All inputs and BRUKL document, as proof of the legitimacy of the above calculations, can be found in the appendices.

2.0 INTRODUCTION

QuinnRoss Consultants was commissioned to develop an energy assessment for the proposed *Duddery Hill* development that would demonstrate how it will provide heating and power and meet the energy and carbon emission targets set by national, regional, and local policy.

The site is in Haverhill, Suffolk. The development is a new-build storage facility. A 3D model image of the development is below:

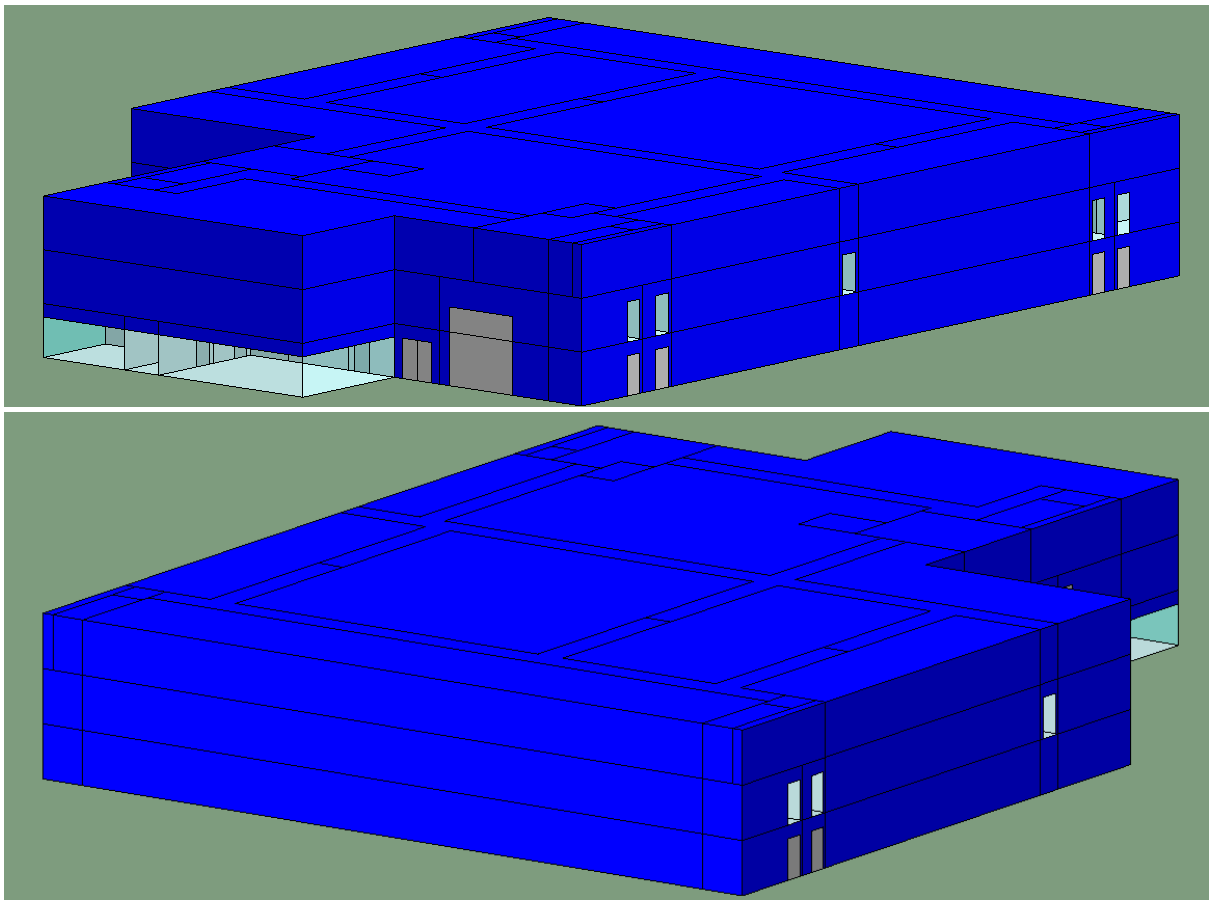
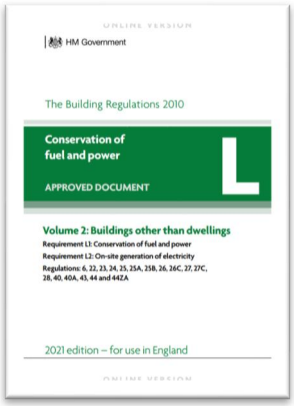


Figure 02: IES thermal model image of scheme

3.0 PLANNING POLICY AND LEGISLATION

This section describes the planning policies and regulations that will affect the proposed development. These are outlined below:

- Building Regulations Part L 2021, new buildings other than dwellings.
- St Edmundsbury Core Strategy 2010.



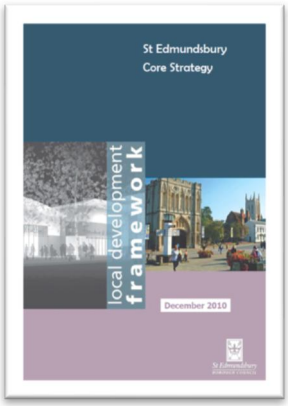


Figure 03: Document front cover images of applicable policies

3.01 Building Regulations Part L 2021

The development will be subject to the Approved Document Part L 2021, for new non-domestic buildings. It sets out requirements for limiting carbon emissions from buildings. It is a mandatory requirement that calculations must be carried out to show the Building's Emission Rate (BER) is equal to or less than the calculated Target Emissions Rate (TER). These calculations must be undertaken by a Dynamic Simulation Modelling (DSM) software approved for such calculations. Part L defines five methodology and criteria, the first three can be tested at this design stage. These are described below:

- Criterion 1 – Carbon Emissions Target: Part L 2021 requires that the building's CO_2 Emission Rate (BER) be equal to or lower than a Target CO_2 Emission Rate (TER). The two calculations must be performed in a prescribed way using the same approved modelling software.
- Criterion 2 – Limit to design flexibility: This criterion ensures the building fabric and HVAC systems have a minimum specified performance, e.g., U-value of walls to be no higher than 0.35 W/m^{2}K.
- Criterion 3 – Limits to Solar Gains: Any zone in the actual building that is an occupied space will be subject to a solar gain limit.

There are two further criteria for compliance, which must be determined at the completion of the building.

3.03 St Edmundsbury Core Strategy (2010)

The St Edmundsbury Core Strategy does not outline any specific energy or CO_2 targets however it does outline an expectation for development to seek energy and CO_2 reductions where possible.

4.0 ENERGY HIERACHY

4.01 Be Lean

4.01.01 Building Envelope Thermal Performance

The most effective way of keeping heating energy consumption to a minimum is to ensure the building uses high performing fabric properties. It is proposed the building is well insulated and uses high performing constructions substantially above the current minimum requirement of the building regulations. As a result, the following construction U-values (W/m².K) are proposed:

Envelope Element	U-Value W/m².K	
	Build Regs Requirement	Proposed
Wall	0.35	0.18
Roof	0.25	0.10
Floor	0.25	0.10
Glazing	2.20	1.40

Table 03: Proposed U-values

4.01.03 Air Infiltration

Uncontrolled air infiltration in a building can contribute to a significant proportion of heat losses particularly in well insulated modern buildings. An air permeability of no greater than 3.0 m³/m²h is proposed.

4.01.04 Daylight strategy

The provision of artificial lighting accounts for a significant proportion of most building's primary energy consumption. The maximisation of daylight within a building can reduce this demand significantly. The below items will be considered during the design development period throughout the contract:

- Generous floor to ceiling heights
- Dual aspect glazing in areas where possible
- Daylight dimmable sensors where possible

4.01.05 Energy efficient services

Several energy efficient HVAC and lighting strategies are proposed for the development:

- Lighting – LED lighting will be installed throughout and be chosen to minimise over-illumination.
- Energy meters – energy meters will be installed for all major energy uses including water.
- Central controls – a building management systems (BMS) will be installed in the and enable the heating and DHW systems to respond to the demand dynamically and run more efficiently.
- User controls – Efficient and user-friendly controls will be specified throughout all buildings.

- Heating – The development will be highly insulated for low space heating requirements. Heating will use 100% efficient electric panel heaters, no gas in the building.
- Mechanical ventilation – All extract air ventilation units will utilise low specific fan powers (SFP's).
- Cooling – Efficient mechanical equipment (lighting, fans etc) will be specified to minimise internal gains. Solar control glazing with a 0.40 g-value will also be installed to reduce solar gains.
- Air conditioning – No air conditioning is present on site, mitigating emissions from refrigerants completely.

4.01.06 Insulated pipework

All Internal heating pipework, particularly those located in internal corridors, will be insulated to a standard beyond building regulation requirements. This will minimise issues of internal heat gain and avoid the need for any additional ventilation or cooling.

4.01.07 Unregulated energy use

In addition, efforts are being made to reduce the unregulated emissions by providing "best in class" ("A" rated or equivalent) white goods in each applicable space to encourage energy consumption reduction.

Please note the benefits of high efficiency appliances cannot be included in any results shown in this report. These measures interact to some degree (e.g., more low energy lighting reduces the ancillary heat gains from lighting, so increases the space heating demand) so comparisons of individual results can produce apparent anomalies and are not provided as a result.

4.02 Be Clean

4.02.02 Combined Heat and Power (CHP)

It is not feasible to install a CHP engine for this development as the heating demand would be so small any CHP system would be oversized and use more energy than it produces.

It must also be noted that future Building Regs are widely predicted to be moving away from CHP and natural resource consumption, therefore CHP is not considered.

4.02.03 District Heating

There are no existing or proposed networks in the Suffolk area, therefore DH is not an option.

4.03 Be Green

Although renewable technology was explored the site will has very few occupied / conditioned spaces and subsequently very low energy demand. Any renewable technology despite being efficient will have very minimal impact.

5.0 THERMAL & ENERGY MODELLING RESULTS

5.01 Software Used

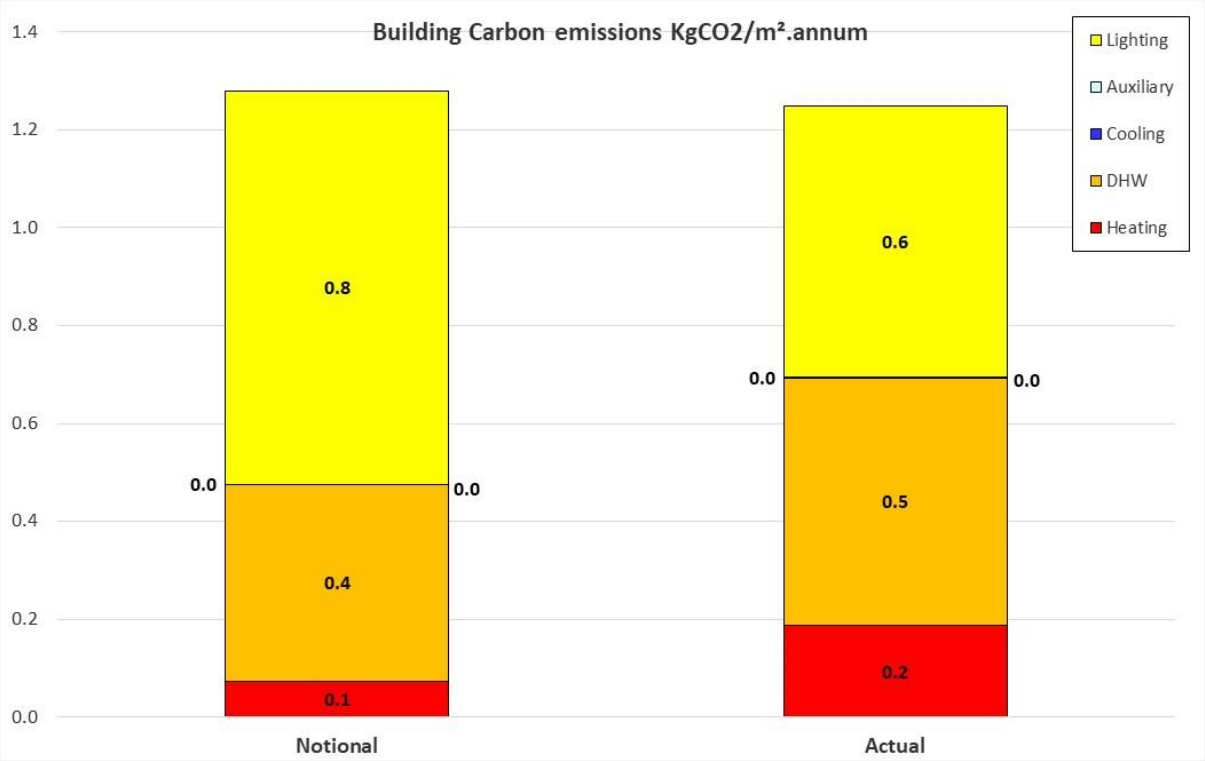
All Part L calculations will use the Dynamic Simulation Modelling (DSM) method. The software used is the *Integrated Environmental Suite (IES)* software *Virtual Environment (VE) Version 2022.1.0.0.* IESVE is one of the world leaders in developing DSM software and is used internationally for all manner of dynamic simulation calculations, including Part L and ASHRAE 90.1 calculations. IESVE is approved by the Department of Community and Local Government (DCLG) for performing Part L2 2021 and EPC calculations and for fills the requirements of CIBSE AM11 as a Building Energy and Environmental Modelling (BEEM) software. The software was used to create a 3-D model based on information provided by the design team as defined in the following section. Hourly simulations for a year were then run as part of the CO_2 emissions analysis using the relevant weather file for the location.

https://www.iesve.com/

The calculations were also carried out by an approved CIBSE Low Carbon Energy Assessor (LCEA) who is a fully accredited Level, 3, 4 and 5 user of IESVE.

5.02 Results

The Part ADL2 results are shown in the table below:



6.0 SUMMARY & CONCLUSION

The proposed development will have to achieve the following energy & sustainability targets:

Requirement	Description / Summary
Building Regulations Part L 2021	Using the inputs outlined in this report the building will be compliant with Part L 2021.
St Edmundsbury Core Strategy (2010)	The building has done everything within reason to keep energy and CO_2 emissions as low as possible.

Table 05: Summary of energy and sustainability targets

To achieve the above targets, the following energy reduction methods will be implemented:

- **High performing building thermal envelope** – Construction U-values performing substantially above the current building regulations. The following construction U-values will be used:

Envelope Element	U-Value W/m².K	
	Build Regs Req	Proposed
Wall	0.35	0.18
Roof	0.25	0.10
Floor	0.25	0.10
Glazing	2.20	1.40

Table 06: Proposed U-values

- **Low Infiltration –** Air tightness no higher than 3.0 m³/m²h.
- **Daylight Strategy** – The maximisation of daylight within a building can reduce lighting demand significantly by using generous floor to ceiling heights, dual aspect glazing and daylight dimmable sensors where possible.
- **Highly efficient lighting with controls** – LED lighting installed throughout with daylight and PIR sensors where possible.
- **Highly efficient HVAC systems** – Only specifying high efficiency electric heaters and no gas on site.
- **Insulated pipe work -** All Internal heating pipework will be insulated to a standard beyond building regulation requirements.
- **Unregulated Energy Use -** In addition, efforts are being made to reduce the unregulated emissions by providing "best in class" ("A" rated or equivalent) white goods where possible.

Thermal and Energy Modelling Results – Current (2021) Building Regulations

The whole development has been analysed for its energy use using approved energy modelling software. The predicted tonnes of CO_2 are shown below:

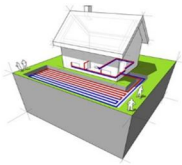
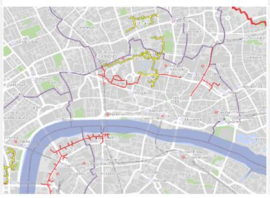
Current Building Regs using Part L 2021						
	New build commercial (includes major refurbishments assessed under Part L2A)		New build residential (includes major refurbishments assessed under Part L1A)		Overall area weighted reductions	
	Total tCO_2	% Reduction at each stage	Total tCO_2	% Reduction at each stage	Total tCO_2	% Reduction at each stage
Baseline	7	N/A	0	N/A	7	N/A
Be Lean	7	2%	0	0%	7	2%
Be Clean	7	0%	0	0%	7	0%
Be Green	8	-11%	0	0%	8	-11%
TOTAL	**-1**	**-9%**	**0**	**0%**	**-1**	**-9%**

Figure 09: Summary of CO_2 emissions and savings

As the results above show, when including all available energy reduction technologies and methods, the building will achieve a 9% improvement over current Building Regulations.

7.0 APPENDICES

7.01 Appendix A – LZC Technology Feasibility Analysis

Technology		Feasibility	
Photovoltaic (PV) Panels		PV's use semiconductor technology to convert incident solar radiation into electrical power. Buildings with large flat roofs several storeys above road level are best suited. Any electricity that is generated and used on site is preferable as every kWh used is one that the development doesn't have to purchase. Any surplus electricity generated can be exported to the national grid, receiving a further export tariff in addition to the generation tariff. This building is ideal for a significant PV array with a large flat roof that's open with little plant space required.	**High**
Solar Thermal Panels		Solar thermal panels are a method of harvesting the sun's energy, commonly to provide a source of preheated water. Hot water use for this building however is expected to be minimal therefore any solar thermal panels will have a very limited impact, if any.	**Low**
Ground Source Heat Pump (GSHP)		A GSHP takes low-grade heat from the ground and uses electricity to convert it to useful heat (at approximately 40°C) that can be used to heat a building. The ground can also be used as a heat sink to provide cooling. The bore holes and length of pipework into the ground required for this tech make this option difficult to justify considering the developments London location.	**Low**
Air Source Heat Pump (ASHP)		Similar to the GSHP, ASHP utilises the external environment as a heat source. A heat pump uses electricity or gas to run a refrigerant cycle, extracting heat from external air to convert it to useful heat for space heating. ASHPs offer high efficiencies and are suited to institutional and commercial properties. Although they could be used for this development, the development's energy consumption will be minimal resulting in any heat pump system being over sized and therefore not running efficiently.	**Medium**
Wind Turbines		Wind energy can be converted to electricity by using wind turbines. This renewable technology is suited to exposed areas free from obstructions where the average wind speeds are high. On the site there are plenty of obstructions which would lead to the wind having a turbulent nature resulting in poor output for turbines, plus they have significant visual and noise impacts on neighbouring areas. Hence they are unsuitable for this development.	**Low**
Biomass		Biomass fuel is usually wood chips or wood pellets, and as it comes from plants it is considered a low-carbon source of high-grade heat that can be used for space heating, domestic hot water and, with absorption chillers, cooling (this last option is very rarely implemented due to high capital cost). A biomass boiler needs to operate under a reasonably constant load being a solid fuel boiler; it is unable to respond to load fluctuations as quickly as a gas or oil boiler. This limits the boilers to being suitable to operate for the provision of the base load. This could still be suitable for this development for its likely large base load however biomass also has the potential to have a significantly detrimental effect on air quality in the local vicinity, frequent fuel deliveries are required which could be disruptive to residents and there are significant maintenance costs. Unless a free source of wood can be found, such as waste from a factory or forestry management operation, the biomass fuel is often the same price or more expensive than gas. This means that the additional capital outlay on top of the increased fuel, maintenance costs, air quality, running costs and maintenance issues make biomass less viable than other tech available.	**Low**
Combined Heat and Power		CHP is the simultaneous generation of usable heat and power (usually electricity) in a single process, the heat being distributed in surrounding buildings instead of being wasted. CHP is best suited to buildings with large heating and DHW demands which this building will not have. It must also be noted that future Building Regs will be moving away from CHP and natural resource consumption, therefore heat pumps are deemed more suitable.	**Low**
District Heating		DH tends to be large CHP units run by commercial energy firms supplying energy to local buildings through underground pipework. Though they offer the same benefits as an on site CHP, without maintenance costs (provided by the supplier), the limitations are the proposed site needs to be within reasonable distance of a network. There are no existing or proposed netwroks in the Suffolk area therefore this option is not feasible.	**Low**

7.02 Appendix B – Input data used for calculations

Construction

Constructions U-values W/m^2.K	
Floor	0.10
Wall	0.15
Roof	0.10
Door	1.00

Glazing	
Overall U-value (including frame)	1.40 W/m²K
g-value	0.60

Air Permeability	
Air permeability	3.0 m^3/m^{2}h

HVAC Systems

Electric panel heaters	
System description	Heating only using electric panel heaters
NCM system type	Other local room heater - unfanned
Heat source	Direct or storage electric heater
Heating fuel type	Electricity
Heating generator seasonal efficiency	1.00
Cooling system	no vent/ extract
Cooling fuel type	-
Cooling seasonal energy efficiency rating (SEER)	-
AHU Specific fan power (SFP)	-
AHU Pump type	-
Mech vent SFP (per unit)	-
Heat recovery efficiency	-
Ventilation controls	-

DHW	
NCM system type	Other local room heater - unfanned
Heating fuel type	Electricity
Delivery efficiency	99%
Storage volume (l)	-
Storage insulation	-

Ventilation

Extract vent	
Ventilation extract rate	6 ach
SFP	0.3
Areas served	Bathroom

Lighting

Lighting power densities	lm/W
All areas	190

Power & Lighting controls	
Electric Power Factor	0.90 - 0.95
PIR's	PIR's in all areas
Daylight sensors	None
Metering / Monitoring	Lighting systems have provision for metering
Lighting control parasitic power	0.10 W/m²

Renewables

None	
-	-

7.03 Appendix C – BRUKL Document

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Cinch Haverhill

As designed

Date: Fri Sep 16 17:01:04 2022

Administrative information

Building Details

Address: Duddery Hill, Haverhill, CB9 8DR

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.15

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.15

BRUKL compliance check version: v6.1.b.0

Certifier details

Name: James Seager

Telephone number: 01795 841 035

Address: Unit 3, Grove Dairy Farm Business Centre, Sittingbourne, ME9 8NY

Foundation area [m²]: 115.07

The CO_2 emission and primary energy rates of the building must not exceed the targets

Target CO_2 emission rate (TER), $kgCO_2/m^2$.annum	1.35	
Building CO_2 emission rate (BER), $kgCO_2/m^2$.annum	1.26	
Target primary energy rate (TPER), kWh/m^2.annum	14.51	
Building primary energy rate (BPER), kWh/m^2.annum	13.59	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.15	0.15	DH000001:Surf[2]
Floors	0.18	0.1	0.1	DH000001:Surf[0]
Pitched roofs	0.16	-	-	No Pitched roofs in building
Flat roofs	0.18	0.1	0.1	DH000032:Surf[0]
Windows** and roof windows	1.6	1.45	1.45	DH000001:Surf[1]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	1	1	DH000009:Surf[1]
Vehicle access & similar large doors	1.3	-	-	No Vehicle access doors in building
High usage entrance doors	3	-	-	No High usage entrance doors in building

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m^2K)]

$U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m^2K)]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m^2K)]

* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

** Display windows and similar glazing are excluded from the U-value check.

*** Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m^2K

N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
$m^3/(h.m^2)$ at 50 Pa	8	3

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	0.9 to 0.95

1- ELECTRIC PANEL HEATERS

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

"No HWS in project, or hot water is provided by HVAC system"

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
DH Ground: DWC	0.3	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
DH Ground: Shop	190	-	-
DH Ground: Manager	190	-	-
DH Ground: IT	190	-	-
DH Ground: DWC	190	-	-
DH Ground: Lobby	190	-	-
DH Ground: Break	190	-	-
DH Ground: Package	190	-	-
DH Ground: Bottom Left Staircase	190	-	-
DH Ground: Storage 1	190	-	-
DH Ground: Bottom Right Staircase	190	-	-
DH Ground: Lift Right	190	-	-
DH Ground: Loading Bay Left	190	-	-
DH Ground: Loading Bay Right	190	-	-

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m^2]	5815.1	5815.1
External area [m^2]	5528.2	5528.2
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	3	5
Average conductance [W/K]	795.6	1698.37
Average U-value [W/m^2K]	0.14	0.31
Alpha value* [%]	24.9	10

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area	Building Type
	Retail/Financial and Professional Services
	Restaurants and Cafes/Drinking Establishments/Takeaways
	Offices and Workshop Businesses
	General Industrial and Special Industrial Groups
100	**Storage or Distribution**
	Hotels
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	Secure Residential Institutions
	Residential Spaces
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
	Non-residential Institutions: Education
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	General Assembly and Leisure, Night Clubs, and Theatres
	Others: Passenger Terminals
	Others: Emergency Services
	Others: Miscellaneous 24hr Activities
	Others: Car Parks 24 hrs
	Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m^2]

	Actual	Notional
Heating	1.35	0.62
Cooling	0	0
Auxiliary	0	0.01
Lighting	4.01	6.87
Hot water	3.65	3.43
Equipment*	25.06	25.06
TOTAL**	**9.01**	**10.93**

* Energy used by equipment does not count towards the total for consumption or calculating emissions.
** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m^2]

	Actual	Notional
Photovoltaic systems	0	1.14
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*1.14*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	3.89	3.14
Primary energy [kWh/m^2]	13.59	14.51
Total emissions [kg/m^2]	1.26	1.35

7.04 Appendix D – Draft EPC

Energy Performance Certificate

Non-Domestic Building

HM Government

Duddery Hill
Suffolk
Address 3
Address 4
Haverhill
CB9 8DR

Certificate Reference Number:
7807-8312-5183-2538-0968

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government's website at www.gov.uk/government/collections/energy-performance-certificates.

Energy Performance Asset Rating

More energy efficient

A+

Net zero CO_2 emissions

A 0-25

B 26-50

C 51-75

D 76-100

E 101-125

F 126-150

G Over 150

17 **This is how energy efficient the building is.**

Less energy efficient

Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Heating and Mechanical Ventilation
Total useful floor area (m^2):	5815.050
Building complexity:	Level 5
Building emission rate ($kgCO_2/m^2$ per year):	1.26
Primary energy use (kWh/m^2 per year):	13.59

Benchmarks

Buildings similar to this one could have ratings as follows:

18 If newly built

47 If typical of the existing stock

Administrative information

This is an Energy Performance Certificate as defined in the Energy Performance of Buildings Regulations 2012 as amended.

Assessment Software:	Virtual Environment v7.0.15 using calculation engine ApacheSim v7.0.15
Property Reference:	UPRN-000000000000
Assessor Name:	James Seager
Assessor Number:	LCEA181300
Accreditation Scheme:	CIBSE Certification Limited
Assessor Qualifications:	NOS5
Employer/Trading Name:	Trading Name
Employer/Trading Address:	Trading Address
Issue Date:	16 Sep 2022
Valid Until:	15 Sep 2032 (unless superseded by a later certificate)
Related Party Disclosure:	Not related to the owner

Recommendations for improving the energy performance of the building are contained in the associated Recommendation Report: 0252-5693-9637-8483-0342

About this document and the data in it

This document has been produced following an energy assessment undertaken by a qualified Energy Assessor, accredited by CIBSE Certification Limited. You can obtain contact details of the Accreditation Scheme at www.cibsecertification.com.

A copy of this certificate has been lodged on a national register as a requirement under the Energy Performance of Buildings Regulations 2012 as amended. It will be made available via the online search function at www.ndepcregister.com. The certificate (including the building address) and other data about the building collected during the energy assessment but not shown on the certificate, for instance heating system data, will be made publicly available at www.opendatacommunities.org.

This certificate and other data about the building may be shared with other bodies (including government departments and enforcement agencies) for research, statistical and enforcement purposes. For further information about how data about the property are used, please visit www.ndepcregister.com. To opt out of having information about your building made publicly available, please visit www.ndepcregister.com/optout.

There is more information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government website at: www.gov.uk/government/collections/energy-performance-certificates. It explains the content and use of this document and advises on how to identify the authenticity of a certificate and how to make a complaint.

Opportunity to benefit from a Green Deal on this property

The Green Deal can help you cut your energy bills by making energy efficiency improvements at no upfront costs. Use the Green Deal to find trusted advisors who will come to your property, recommend measures that are right for you and help you access a range of accredited installers. Responsibility for repayments stays with the property - whoever pays the energy bills benefits so they are responsible for the payments.

To find out how you could use Green Deal finance to improve your property please call 0300 123 1234.