



ENERGYREPORT
building certification | compliance | testing

Sustainability Assessment Report

640 Oxford Road, Reading, Berkshire RG30 1EH

J03806

VX KVA Ltd

19th December 2025

Registry of Amendments

Revision	Date	Amendment Details	Prepared by
0	19/12/25	Initial Release	G Sewell

About Energy Report Limited

A specialist building energy and sustainability consultancy offering expertise and experience to our clients within the construction and building sectors. Offering a fully inclusive service from design to completion for any energy efficiency or sustainability issue.

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1.0 EXECUTIVE SUMMARY

Energy Report Ltd has prepared this Sustainability Assessment Report in support of a full planning application for refurbishment and extension to form a new commercial unit of a mixed-use development at 640 Oxford Road, Reading, Berkshire RG30 1EH.

This report will discuss only the new-build ground-floor commercial unit and has been developed to meet Planning Conditions 20 and 21 of the Reading Borough Council (RBC) Planning Permission granted in June 2023 (PA 220780).

Eight separate areas of sustainability have been identified, and solutions proposed for each. These are based on the widely recognised building certification scheme BREEAM, specifically New Build Version 7. This will aid in a comprehensive sustainability analysis of the proposed development and the construction of a building that will benefit the local environment and community for many years to come.

Implementing the measures described in this report will result in a final development that is holistically sustainable in a wide variety of ways, mitigating pollution of carbon, noise, light, waste and water, as well as ethically sourcing all materials used and maintaining better than good practice levels of construction management, procurement and operational use of the building.

2.0 DEVELOPMENT DESCRIPTION

The proposed project consists of the refurbishment of the existing three-storey detached building (and basement) with a rear extension added, comprising a ground-floor commercial unit and two residential units above. The finished development will consist of 3x commercial units in the basement and ground floor, and 4x residential units on the first and second storeys.



Figure 1 – Elevations of the proposed development

This report will focus on the new ground-floor rear commercial unit. This can be seen on the floor plan below, highlighted with a red line.

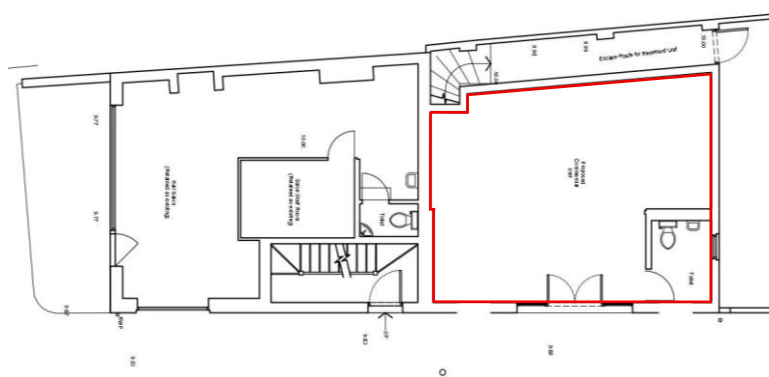


Figure 2 – Ground-floor plan of the proposed development

3.0 MANAGEMENT

Responsible Construction:

All temporary site timber and timber-based products (excluding reused timber) used during the project's construction will be legal and sustainable timber. All parties who manage the construction site at any stage will operate an EMS covering their primary operations. The EMS will be third-party certified to ISO 14001, EMAS (EU Eco-Management and Audit Scheme), or an equivalent standard.

As the project would be considered small scale under BREEAM Version 7, the contractor will achieve the requirements under the following categories in Table 4.1 of Man 03 - Tidiness, Health +Wellbeing as a minimum.

Responsibility for site monitoring is assigned to a named individual. The responsible individual will have the appropriate authority and experience to access the data required. They are required to monitor, record and report energy use, water consumption and transportation data (where measured) resulting from all on-site construction processes (and dedicated off-site manufacturing) throughout the build programme.

Commissioning and Handover:

A commissioning and testing schedule will be prepared before handover. The schedule identifies and includes a suitable timescale for commissioning and re-commissioning of all complex and non-complex building services and control systems, and for testing and inspecting building fabric.

Post-construction testing and inspection will be completed to quality-assure the integrity of the building fabric, including the continuity of insulation, the avoidance of thermal bridging, and the prevention of air leakage paths. A suitably qualified professional will undertake the survey and testing in accordance with the appropriate standards.

4.0 HEALTH + WELLBEING

Natural Light:

Relevant building areas will achieve at least 'nominally accepted' daylight sufficiency as per IES LM-83-23.

Artificial Light:

All lighting types have been designed to avoid flicker and stroboscopic effects, including across their full dimming and colour-tuning ranges. This applies to all internal and external lighting. Additionally, all internal lighting in relevant areas of the building is designed to provide illuminance (lux) levels and colour rendering index in accordance with the SLL Code for Lighting 2022 and any other relevant industry standards. Internal lighting is appropriate for the tasks undertaken, considering the building's users' concentration and comfort levels. Internal lighting is also zoned to allow for occupant control in accordance with the criteria below for relevant areas present within the building.

All external lighting located within the construction zone is specified in accordance with BS 5489-1:2020(26) and BS EN 12464-2:2024(27). External lighting provides illuminance levels that enable users to perform outdoor visual tasks efficiently and accurately, especially during the night.

Indoor Air Quality:

Indoor air quality will be considered during the design and construction phases to reduce high-contaminant sources and promote effective ventilation strategies, including purge-and-flush ventilation.

The building has been designed to minimise pollutant concentration and recirculation. The fenestrations will provide fresh air into the building in accordance with one of the best-practice ventilation standards.

The ventilation strategy provides adequate ventilation rates throughout the year, including sufficient airflow rates in summer to prevent overheating and maintain required thermal comfort conditions, in accordance with CIBSE AM10(38) (for naturally ventilated buildings).

Internal product types meet the emission limits, testing requirements and any additional requirements listed in Table 5.6 of BREEAM Version 7. Where wood-based products are selected for internal fixtures and fittings, they will be tested and classified as formaldehyde E1 class as a minimum.

Safe and Accessible Design:

Dedicated and safe cycle paths are provided from the site entrance to any cycle storage and connect to off-site cycle paths where applicable. Dedicated and safe footpaths are provided on and around the site, giving suitable links for the following:

- The site entrance to the building entrance
- Car park to the building entrance
- The building to the outdoor space
- Connecting to off-site paths where applicable.

Parking and turning areas are designed to facilitate simple manoeuvring, depending on the type of delivery vehicle likely to access the site, thus avoiding the need for repeated shunting.

Security:

A suitably qualified security specialist will conduct an evidence-based security needs assessment (SNA) during or before Concept Design (RIBA Stage 2). The purpose of this is to identify any security-relevant attributes of the proposed development, site context, and surrounding environment that may influence the security strategy. Based on these findings, the SQSS will provide a set of security controls and design recommendations. These will directly address the specific threats and assets identified in the SNA. The agreed security controls and recommendations will be incorporated into proposals and implemented in the as-built development. Any deviation from those controls and recommendations shall be justified and agreed with the SQSS.

5.0 ENERGY

Energy and carbon performance for regulated energy uses:

The overall Energy Performance Ratio (EPRNC) has been calculated from the Design Stage SBEM Assessment. This has reached a score of 0.36, just below an 'Excellent' score in line with BREEAM Version 7 ENE01.

The proposed thermal properties are shown in Table 2. All elements meet or exceed the minimum requirements set out in Building Regulations Part L.

Building Element	Proposed Development (W/m ² K)	Part L limits (W/m ² K)
Walls	0.18	0.26
Floor	0.14	0.18
Roof	0.18	0.18
Window	1.2	1.6
Door	1.2	2.0
Air Permeability	4.00	8.00

Table 2: Proposed fabric efficiency standard versus Part L acceptable standards.

The outcome of the above measures in the table is detailed below, which identifies that the overall CO₂ reduction for the proposed extension is 35.76%

Unit	TER (kgCO ₂ /m ² /year)	BER (kgCO ₂ /m ² /year)	% Reduction
640 Oxford Road	4.67	3.00	35.76

Table 3: CO₂ reduction results.

The project team has analysed the proposed development to assess the impact of alternative fabric specifications on the building's heating and cooling demand. This is in line with ENE 04 Low Carbon Design within BREEAM Version 7. This analysis and the final choice of materials and constructions led to the above 35.76% reduction, far larger than the corresponding 5% or 10% improvements required within ENE 04.

Prediction of operational energy and carbon:

An energy strategy for the building has been defined at the concept design stage, describing qualitatively how the building's operational energy and carbon performance will be minimised. A detailed energy model was constructed during the technical design stage, and sensitivity analysis and scenario modelling were performed to explore the impact of key parameters and assumptions on energy consumption.

Energy monitoring

Energy sources will be identified that will be used by the building, and an estimate of the annual energy consumption will be made for the following: -

- Grid supplies electricity
- Grid supply gas

Energy monitoring will be installed to ensure $\geq 90\%$ of the estimated annual energy consumption for each energy source is assigned to an end-use category. As the building is less than 1000m², the energy monitoring systems will be selected accordingly. Systems will be installed that allow energy consumption to be assigned to separately tenanted or occupied areas and to relevant functional areas within the building.

6.0 TRANSPORT

Transport Assessment and Travel Plan

A site-specific transport assessment will be completed by the end of the Concept Design stage. This will then aid the development of a site-specific travel plan following the transport assessment recommendations, also by the end of the Concept Design stage. The travel plan will demonstrate and guide the appropriate implementation of sustainable transport measures during the design, construction, and occupancy stages. The building's management will support it during operation.

Sustainable Transport Measures

The transport assessment and travel plan will provide up-to-date local public transport information in a convenient, accessible area to help building users plan journeys by public transport. It will discuss the potential of car-sharing and electric vehicle charging infrastructure and engage with the local authority at the earliest stage to review public cycle and pedestrian routes. The project will have installed at least the minimum number of cycle storage spaces required for the development. It will ensure that at least three relevant amenity types are within 500m of the development.

7.0 WATER

Water Consumption

The water efficiency of all in-scope water-consuming components will be determined, along with the amount of any recycled water expected from approved blackwater, greywater, and rainwater systems.

Water Monitoring

A water meter with a pulsed or other open protocol output will be installed on all potable water supplies entering the building. Water-consuming plant or building areas with significant water demand will be fitted with easily accessible sub-meters or have water-monitoring equipment integral to the plant or area.

The development has a gross internal area of less than 1000m². Therefore, the water meters will be either i) connected to an appropriate water monitoring and management system, or ii) Accessible meters with pulsed outputs or other open protocol communication outputs.

Water-Efficient Equipment and Systems

The design team will identify systems and equipment that use significant amounts of water for non-sanitary uses that are included in the project specification. The design team will also determine the ratio of in-scope non-sanitary water consumption to sanitary water consumption in line with BREEAM Version 7 WAT 04.

Prediction of Operational Water Consumption

The design team will estimate the building's annual operational water consumption and then discuss the potential for in-use water performance targets and commitments to measure water consumption.

8.0 MATERIALS

Environmental Product Declarations

The development will, where possible, use only products with environmental product declarations (EPDs) that achieve a total EPD points score of at least 20, according to BREEAM Version 7 MAT02 Section M1. These elements will have a low embodied impact relative to their thermal properties, determined by the Green Guide to Specification targeting A or A+ ratings, and all thermal insulation products used in the building will be responsibly sourced.

Responsible Sourcing of Construction Products

100% of timber and timber-based products used on the project are 'Legal' and 'Sustainable' as per the UK Government's Timber Procurement Policy (TPP). The design team will use a sustainable procurement plan to guide specifications toward sustainable construction products. The plan will include sustainability aims, objectives, and strategic targets to guide procurement activities. Secondly, it will require assessing the potential to procure construction products locally where possible. Thirdly, it will include details of the procedures in place to verify the effective implementation of the sustainable procurement plan. Finally, the documented policy and procedure will be disseminated to all relevant internal and external personnel and included within the construction contract to ensure that they are enforceable on the assessed project.

Durability and Resilience

Protection measures will be incorporated into the building's design and construction to reduce damage to the building's fabric or materials in the event of accidental or malicious damage. These measures will protect against the negative impacts of high user numbers in relevant areas of the building, damage from any vehicle or trolley movements within 1 metre of the internal building fabric in the storage, delivery, and corridors, and damage to the external building fabric by a vehicle. Protection where parking or manoeuvring areas are within 1 metre of the building façade and where delivery areas or routes are within 2 metres of the façade, and finally, potential malicious damage to building materials and finishes, in public and common areas.

Key exposed building elements have been designed and specified to limit long-term and short-term degradation due to environmental factors. This will be demonstrated through an assessment of the element's resilience to applicable material degradation and environmental factors.

9.0 WASTE

Construction Waste Management

Complete a pre-demolition audit of any existing buildings, structures or hard surfaces being considered for demolition. This will be used to determine whether refurbishment or reuse is feasible. The audit will be carried out at the Concept Design stage by a competent person before strip-out works. It will help guide the design by considering materials for reuse and setting targets for waste management. Finally, it will engage all contractors in maximising opportunities for high-grade reuse and recycling. During the construction phase, actual waste generation will be compared with waste management routes to forecast and investigate significant deviations from planned targets.

A Resource Management Plan (RMP) will be prepared to cover non-hazardous waste materials (from on-site construction and dedicated off-site manufacture or fabrication), including demolition and excavation waste. It will record accurate data on waste arisings and waste management routes.

Where applicable, diversion from landfill for non-hazardous construction and demolition waste generated will be aimed for. Waste materials will be sorted into separate key waste groups as per Table 10.3 within BREEAM Version 7, either on-site or through a licensed contractor for recovery.

Use of Recycled and Sustainably Sourced Aggregates

A Pre-Demolition Audit of existing buildings (and individual elements), structures or hard surfaces in accordance with waste management above will be undertaken. It will identify all aggregate uses and types on the project, determine the quantity in tonnes for each identified use and aggregate type, identify the region where each aggregate source is located, and finally calculate the distance in kilometres travelled by all aggregates by transport type.

Operational Waste

A dedicated space, identified by clear signage, for the segregation and storage of operational recyclable waste will be provided on the site. The space will be:

- Clearly labelled for long-term durability, to assist with segregation, storage and collection of the recyclable waste streams
- Accessible to building occupants or facilities operators for the deposit of materials and collections by waste management contractors.
- Of a capacity appropriate to the building type, size, and predicted volumes of waste that will arise from daily or weekly operational activities and occupancy rates.

Adapting to Climate Change

A climate change adaptation strategy appraisal will be conducted. This will be a systematic risk assessment to identify the impact of expected extreme weather conditions arising from physical

climate risks and climate change on the building and vulnerabilities over its projected life cycle. The assessment will cover the installation of building services and renewable systems, as well as structural and fabric resilience aspects and includes:

1. Hazard identification
2. Hazard assessment
3. Risk estimation
4. Risk evaluation
5. Risk management

The recommendations or solutions within the climate change adaptation strategy appraisal will be implemented during concept design. This will lead to an update during Technical Design, demonstrating how the recommendations or solutions proposed at Concept Design have been implemented, where practical and cost-effective.

10.0 POLLUTION

Impact of Refrigerants

Any systems with electric compressors will comply with relevant safety standards for installing refrigerant systems. The refrigerants used will have an ozone depletion potential of zero. Additionally, any systems using refrigerants will either have an average direct effect life cycle (DELCC) carbon dioxide equivalent (CO₂e) emission rate of < 100 kgCO₂e perkW cooling or heating capacity or use a refrigerant with a global warming potential (GWP) of < 10 kgCO₂e/kg.

Local Air Quality

Emissions from all installed combustion plants that provide space heating or domestic hot water do not exceed the following levels: 56 NO_x/kWh in low-population locations or 27 NO_x/kWh in high-population locations.

Flood and Surface Water Management

An appropriate consultant will be appointed to carry out and demonstrate the development's compliance with all criteria. A site-specific flood risk assessment (FRA) will confirm in which flood zone the development is located.

Surface water run-off design solutions will be bespoke, i.e. they will take account of the specific site requirements and natural or man-made environment of and surrounding the site. The priority levels detailed in the BREEAM Methodology will be followed, with justification given by the appropriate consultant, where water is allowed to leave the site.

As the site is considered a brownfield, drainage measures are specified to ensure that the peak runoff

from the site to the watercourses (natural or municipal) shows a 30% improvement for the developed site compared with the pre-developed site. This should comply with the 1-year and 100-year return period events.

Reduction of Night-Time Light Pollution

Light pollution targets will aim to eliminate all potential through a practical design that removes the need for artificial lighting at night. This will not adversely affect the safety and security of the site and its users. Alternatively, the lighting strategy will be designed to reduce obtrusive light. This includes both external lighting and internal lighting in spaces with glazed apertures.

Reduction of Noise Pollution

Where there are noise-sensitive areas within an 800m radius of the assessed site, a noise impact assessment compliant with BS 4142:2014 is commissioned. Noise levels will be measured or determined for existing background noise at the nearest or most exposed noise-sensitive development to the proposed assessed site, including existing plant on the building, as the assessed development is an extension of the building. A suitably qualified acoustic consultant will carry out the noise impact assessment.

11.0 CONCLUSION

Energy Report Ltd has prepared this Sustainability Assessment Report in support of a full planning application for the refurbishment and extension of a mixed-use development at 640 Oxford Road, Reading, Berkshire RG30 1EH.

This report discussed only the new-build ground-floor commercial unit and has been developed to meet Planning Conditions 20 and 21 of the Reading Borough Council (RBC) Planning Permission granted in June 2023 (PA 220780). This report is an alternative sustainability assessment that meets the requirements of RBC, including the proposed BREEAM assessment criteria.

Implementing the measures described in this report will result in a final development that is holistically sustainable in a wide variety of ways, mitigating pollution of carbon, noise, light, waste and water, as well as ethically sourcing all materials used and maintaining better than good practice levels of construction management, procurement and operational use of the building.

12.0 APPENDIX

BRUKL Output Document



Compliance with England Building Regulations Part L 2021

Project name

Building 1

As designed

Date: Wed Dec 17 10:08:58 2025

Administrative information

Building Details

Address: 640 Oxford Road, READING, RG30 1EH

Certifier details

Name: Thomas Pope

Telephone number: 01489 883231

Address: 25 Barnes Wallis Road, FAREHAM, PO15 5TT

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.2

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v7.3.1

BRUKL compliance module version: v6.1.e.1

Foundation area [m²]: 81.45

The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	4.67
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	3
Target primary energy rate (TPER), kWh _{PE} /m ² annum	49.79
Building primary energy rate (BPER), kWh _{PE} /m ² annum	32.21
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 -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.2	0.26	Block 2 - Retail_P_7
Floors	0.18	0.14	0.14	Block 2 - Retail_S_3
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.18	0.18	Block 5 - Zone 1_R_4
Windows** and roof windows	1.6	1.2	1.2	Block 2 - Retail_G_12
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors
U _a -Limit = Limiting area-weighted average U-values [W/(m ² K)] U _a -Calc = Calculated area-weighted average U-values [W/(m ² K)] U _i -Calc = Calculated maximum individual element U-values [W/(m ² K)] * 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 ² K NB: 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	4

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	NO
Whole building electric power factor achieved by power factor correction	<0.9

1- AC

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.5	7	-	-	-
Standard value	2.5*	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

1- DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.021
Standard value	1	N/A

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
	Standard value	95	80	0.3
Block 2 - Retail		150	-	-
Block 2 - wc		150	-	-
Block 5 - Zone 1		150	-	-

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Block 2 - Retail	NO (-42.4%)	NO
Block 2 - wc	NO (-82.9%)	NO
Block 5 - Zone 1	YES (+17.9%)	NO

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	NO
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m ²]	81.5	81.5
External area [m ²]	191.5	191.5
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	4	3
Average conductance [W/K]	58.15	85.76
Average U-value [W/m ² K]	0.3	0.45
Alpha value* [%]	38.34	27.99

* 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
100	Offices and Workshop Businesses
	General Industrial and Special Industrial Groups
	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/m²]

	Actual	Notional
Heating	6.25	16.94
Cooling	10.08	5.66
Auxiliary	0	0
Lighting	10.1	7.87
Hot water	4.08	2.89
Equipment*	42.19	42.19
TOTAL**	30.5	33.35

* 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/m²]

	Actual	Notional
Photovoltaic systems	9.4	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>9.4</i>	<i>0</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	274.59	250.63
Primary energy [kWh _{PE} /m ²]	32.21	49.79
Total emissions [kg/m ²]	3	4.67

HVAC Systems Performance

System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	94.3	180.3	6.2	10.1	0	4.19	4.97	4.5	7
Notional	161	89.6	16.9	5.7	0	2.64	4.4	----	----

Key to terms

Heat dem [MJ/m2]	= Heating energy demand
Cool dem [MJ/m2]	= Cooling energy demand
Heat con [kWh/m2]	= Heating energy consumption
Cool con [kWh/m2]	= Cooling energy consumption
Aux con [kWh/m2]	= Auxiliary energy consumption
Heat SSEFF	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER	= Cooling system seasonal energy efficiency ratio
Heat gen SSEFF	= Heating generator seasonal efficiency
Cool gen SSEER	= Cooling generator seasonal energy efficiency ratio
ST	= System type
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type