

Glossary

A-value – Water absorption coefficient of a material in $\text{kg/m}^2\text{s}^{0.5}$.

Absolute Humidity – The measure of water vapor (moisture) in the air, regardless of temperature. It is expressed as grams of moisture per cubic meter of air (g/m^3).

ACH - Air changes per hour – The number of times per hour that the air inside a building is changed.

ADL1B – Approved Document Part L1B: Conservation of fuel and power in existing dwellings.

Air permeability – Defined in BS EN 13829. Units $\text{m}^3/\text{m}^2\text{hr}$ at 50 Pascals or m/h @ 50 Pa.

BREDEM – The BRE Domestic Energy Model (BREDEM) is a methodology for calculation of the energy use and fuel requirements of dwellings based on their characteristics. It shares some features with the SAP methodology, but allows users to adjust inputs which are fixed in SAP, making it better suited to certain analysis tasks. The current edition is BREDEM 2012.

AECB – Association for Environment Conscious Building, a network for promoting sustainable building and creator of the Carbonlite Retrofit Course.

Airtightness – The fundamental building property that impacts **infiltration*** (the uncontrolled inward leakage of outdoor air through cracks, interstices or other unintentional openings of a building, caused by pressure effects of the wind and/or stack effect). (*[https://en.wikipedia.org/wiki/Infiltration_\(HVAC\)](https://en.wikipedia.org/wiki/Infiltration_(HVAC)))

ASHP - Air source heat pump – Air source heat pumps (ASHPs) takes low-grade heat from the outside air and convert it into heat for use in providing central heating and hot water. They are best suited to “off-gas” properties. They are eligible for the renewable heat incentive (RHI, see above).

BBA Certification – British Board of Agreement - the UKs leading construction certification body.

BEIS – Government Department for Business, Energy & Industrial Strategy.

Biomass boiler – Biomass boilers take solid fuel such as logs, wood chip, or pellets and burn them to provide central heating and hot water. Their main advantage is in their use of renewable fuel, which results in lower CO_2 emissions. They are best suited to “off-gas” properties. They are eligible for the renewable heat incentive (RHI, see above).

BRE – A multi-disciplinary, UK based, building science centre with a mission to improve buildings and infrastructure, through research and knowledge generation.

BREDEM – BRE Domestic Energy Model. Used to underpin SAP.

Cavity wall insulation – From around 1920, houses in the UK were typically built with a cavity in between two layers of brick wall. Heat loss through this type of wall can therefore be reduced using cavity wall insulation, which is installed by blowing insulating material into the gap. Where applicable, it is often one of most cost- effective energy saving measures.

CDM – Condensation, Damp & Mould.

CFL – Compact Florescent Lighting.

CHP – Combined Heat and Power engine.

CIGA – Cavity Insulation Guarantee Agency.

CLR – Carbonlite Retrofit course offered by the AECB.

CO2 – Carbon dioxide, a greenhouse gas.

Combi boiler – A combi boiler is both a water heater and a central heating boiler, combined (hence the name) within one compact unit. Therefore, no separate hot water cylinder is required.

Condensing boiler – Condensing boilers use heat from exhaust gases that would normally be released into the atmosphere through the flue. As a result, they tend to be more efficient than non-condensing boilers.

COP – Coefficient of Performance – the degree to which the heating system used converts energy in the fuel to heat in a dwelling. For example, a GSHP which converts 1 unit of energy in to 3.5 units of heat has a COP of 3.5.

CPD – Continues Professional Development. Training specific to your job.

CWI – Cavity wall insulation.

DCV – Demand Controlled ventilation.

DEA – Domestic Energy Assessor.

Delivered energy – The amount of energy which is supplied to final users, e.g., households, office buildings, schools, factories and cars.

DSER – Doorset Energy Rating.

DSM – Dynamic Simulation Modelling. The most complex modelling technique for energy in buildings.

DPC – Damp Proof Course.

ECO – The Energy Company Obligation (ECO) is a Government subsidy scheme paid for through a levy on UK households' energy bills. It provides grants towards in the installation of energy efficiency measures, such as solid wall, loft and cavity insulation, with a focus on fuel poor and "hard to treat" homes. (<https://www.gov.uk/energy-company-obligation>)

EER – Energy Efficiency rating from SAP.

EnerPHit – The Passivhaus retrofit energy and comfort standard.

EPC – Energy Performance Certificate.

EPS – Expanded Polystyrene. An open cell rigid insulation.

ErP – Energy Related Products Directive.

EWI – External wall insulation – External wall insulation (EWI) is another solution for solid walls or hard to treat cavities. Although room sizes aren't affected, the outside appearance of the building will be affected and roof eaves may need to be extended. The insulation is applied to the walls and then covered in a suitable material – usually render but brick slips, pebbledash or cladding is also available. EWI can be expensive, but can often attract a grant/subsidy.

FGHRS – Flue gas heat recovery systems.

FMB – Federation of Master Builders, a trade association in the construction industry.

FiT or Feed-in Tariff – The Feed-in Tariff (FiT) is a Government subsidy scheme that is designed to incentivise the installation of measures that generate renewable electricity, such as solar panels. Under this scheme, households are paid for the each unit of electricity that they generate, as well as being able to sell excess electricity to the grid. This significantly increases the payback of renewable heating measures. (<https://www.gov.uk/feed-in-tariffs>)

Form Factor – Ratio of the treated floor areas to the heat loss area. The higher the form factor the higher the heat loss per m² floor area.

F_{rsi} – The temperature factor of an internal surface (Module 2.2, Section 2 for arithmetic definition).

GDAO – Green Deal Advice Organisation.

GDA – Green Deal Assessor.

GFI – Ground floor insulation.

GHG – Greenhouse gas emissions.

Glaser method – A simplified modelling tool for analysing moisture in building constructions. Suitable for moisture closed designs.

GSHP - Ground source heat pump – Similar to their air source cousins, ground source heat pumps (GSHPs) takes heat from the ground and uses this to provide central heating and hot water. As, below a certain level, the ground stays at a fairly constant temperature all year round, these can achieve a higher Coefficient of Performance (COP) than air source heat pumps (which work better in milder temperatures). They are eligible for the renewable heat incentive (RHI, see above).

GWP - Global Warming Potential – A measure of how much a given mass of greenhouse gas is estimated to contribute to global warming. It is a relative scale which compares the gas in question to that of the same mass of carbon dioxide (whose GWP is by definition 1). For example, methane, nitrous oxide and sulfur hexafluoride have GWPs many times that of CO₂, although CO₂ is being emitted into the atmosphere in much larger quantities.

HAM – Heat, Air and Moisture simulation, or Hygrothermal simulation. A dynamic simulation method used to evaluate moisture in building constructions (see WUFI).

Heat Loss – Loss of heat via the fabric of the property usually resulting from air infiltration and ventilation.

Heat Gain – Additional heat in a property resulting from metabolic (people and animals), hot water, lights and appliances, solar and heating systems.

Heat Loss Parameter (HLP) – A building's specific heat loss (in units of W/K) divided by the building's floor area (measured internally i.e. within the thermal envelope). Units W/K.m².

HHRSH – High Heat Retention Storage Heaters IAQ – Indoor Air Quality.

IES – The producer of a complex dynamic simulation tool for modelling energy use (and overheating) in buildings.

IEV – Intermittent extract ventilation.

INCA – Insulated Render and Cladding Association.

Infiltration – Non-deliberate ventilation leading to unwanted air-leakage.

IWI - Internal wall insulation – Older walls, especially solid walls, have relatively low insulation values. As there is no cavity to fill, one option is to apply internal wall insulation (IWI), which is then covered by plasterboard. A variety of materials can be used and therefore the thicknesses required to reach Building Regulations varies, but will usually be between 40mm and 100mm. Although internal wall insulation will reduce the room size it is worth remembering that it is only applied to external walls. IWI can be expensive, but can often attract a grant/subsidy.

Kelvin – The primary unit of temperature measurement in the physical sciences, but is often used in conjunction with the degree Celsius, which has the same magnitude.

kWh – A measure of energy use

LEDS – Light emitting diodes. A highly efficient form of lighting.

Low-grade heat – Normally used to mean heat at a temperature of $\leq 100^{\circ}\text{C}$.

LPG – Liquefied Petroleum Gas, a fuel that can be delivered to households in canisters.

LZC – Low and Zero Carbon Technologies.

MCS – Microgeneration certification scheme, required in order to claim the Renewable Heat Incentive and Feed In Tariff.

MEV – Mechanical Extract Ventilation.

MHCLG – Ministry of Housing, Communities & Local Government MMSP – Metering and Monitoring Service Package.

MVHR – Mechanical Ventilation with Heat Recovery -a system of ventilating buildings, in which heat is recovered from the exhaust air stream to preheat the fresh air intake. Normally there are two sets of ductwork, both connected to an air-to-air heat exchanger, with the air flows in the supply and exhaust branches carefully balanced.

N₅₀ – The air tightness at 50 Pascals pressure, measured in air changes per hour (ach) NIA – National Insulation Association.

NO_x – Nitrous Oxides.

NPV, Net Present Value – The total cost of a measure in today's money.

Off-grid – Off-grid is a term mainly used in terms of not being connected to the main or national gas/electrical grid. The higher costs associated with fuels such as coal and LPG means that these properties often have significant scope for cost effective retrofit.

OSB – Oriented Strand Board. A type of construction board made from wood and glue.

PAS 2030 – 2017 Specification for the installation of energy efficiency measures (EEM) in existing buildings.

PAS 2035 – Retrofitting Dwellings to Improve Energy Efficiency: Specification and Guidance.

Pa – Pascals, a unit of pressure.

Passivhaus – A low energy building standard. Passivhaus Institut (PHI) originator of the Passivhaus movement and of the Passivhaus Standard.

Payback Period – The period of time required for an investment to recover its initial outlay in terms of income and/or savings generated.

PAYS – Pay As You Save scheme. PCR – Post Construction Review.

PHPP - Passivhaus Planning Package – A modelling and accreditation software tool developed and updated by the Passivhaus Institut.

PIR/PUR – Polyisocyanurate – high performance insulation. PIV – Positive Input Ventilation.

POE – Post Occupancy Evaluation.

ppm – Parts per million.

Primary energy – The amount of energy mined or extracted at source; e.g., from coal, oil, natural gas, uranium or wood. Includes losses within processes such as electricity generation and transmission.

PSV – Passive Stack ventilation.

PU foam – Polyurethane foam. Closed cell insulation that can be sprayed.

PV – Solar Photovoltaic panels.

PV-T – Solar Photovoltaic panels combined with solar thermal into one panel.

Q₅₀ – Air permeability at 50 Pascals pressure in m³/m²hr.

R-value – The R-value is a measure of thermal resistance for materials. It gives an indication of how quickly they will lose heat (their thermal resistance). The higher the value of R, the better the thermal performance and heat retention of the material or assembly, and the slower any heat loss. Units are m²W/K (m² x Watts / Kelvin).

RdSAP – RdSAP is the method used to produce Energy Performance Certificates (EPCs). Rd stands for Reduced Data, and the method is designed to allow surveys to be completed more quickly and therefore more cheaply than a full SAP survey at some cost of accuracy. RdSAP underpins both Green Deal assessments and the minimum standards regulations. We can offer EPC assessments if required.

RH - Relative Humidity – The percentage of the total amount of water that the air can hold. This changes with temperature.

Retrofit Assessor – Carries out all assessments of a retrofit, see PAS 2035 for full definition.

Retrofit Coordinator – Oversees all retrofit design, construction, handover and monitoring, see PAS 2035 for full definition.

Retrofit Designer – Prepares a retrofit design, see PAS 2035 for full definition.

RHI - Renewable Heat Incentive (RHI) – The Renewable Heat Incentive is a Government subsidy scheme that is designed to incentivise the installation of renewable heating measures, such as biomass boilers and ground source heat pumps. Under this scheme, households are paid for the each unit of renewable heat that they generate. This significantly increases the payback of renewable heating measures.

SAP – SAP (Standard Assessment Process) is a method for assessing the energy performance of houses using a standard methodology specified by the UK government. The current version of SAP is SAP 2012, and it calculates a 'SAP rating' as well as an estimate of energy bills and CO₂ emissions associated with the estimated energy use. The SAP calculations are based on building dimensions, construction (and therefore energy performance) of building elements such as walls and windows, details of the heating and hot water systems and controls, and any installed renewable technologies including solar PV panels.

Sd value – The Sd value is a measure of a materials resistance to water vapour, but is dependent on the thickness of the material. It has units of metres of air layer thickness (m).

Solar thermal panels – Solar water heating systems use solar panels, called collectors, fitted to your roof to convert heat from the sun into hot water. A boiler or immersion heater is often used as a back-up to heat the water further when the sunshine is insufficient to reach the temperature required. They are eligible for the renewable heat incentive (RHI, see above).

Smart meter – As the next generation of gas and electricity meters, smart meters have an accompanying in-home display to help residents keep track of the energy used in their homes, cutting out the need for meter readings.
SPF – Seasonal Performance Factor. A metric usually used for heat pumps, boilers and other space heat generating technologies.

SRHRV – Single Room Heat Recovery Ventilators .

Stack effect – In winter, the warm air inside a building is less dense than the cold external air. Consequently, cold air tends to be drawn in through cracks and gaps at the base of the building, with warm air exfiltrating through openings in and near the top of the building.

STBA – Sustainable Traditional Buildings Alliance is a forum for sustaining and improving traditional buildings.

SWH – Solar water heating.

SWI – Solid wall insulation.

SWIGA – Solid Wall Insulation Guarantee Agency.

TFA – Treated Floor Area. The useful, heated floor areas within a building.

Thermal Bridge – A thermal bridge, also called a cold bridge or heat bridge, is an area of an object (frequently a building) which has a significantly higher heat transfer than the surrounding materials resulting in an overall reduction in thermal insulation of the object or building.

Thermostat – A thermostat is a component of a heating control system which ensures the temperature is maintained at a set level. Your bills will typically fall – all other things being equal – for each degree C you drop your thermostat's temperature setting.

TRV - Thermostatic radiator valves – A thermostatic radiator valve (TRV) is a self-regulating valve fitted to hot water heating system radiator, to control the temperature of a room by changing the flow of hot water to the radiator.

Non-Repeating Thermal Bridge – Junctions between thermal elements (doors and walls, floors and ceilings etc)
Thermal capacity - the ability of the constituent materials in a building to store heat, for a given rise in temperature, measured in units of kWh/K for a whole building or in Wh/K.m² to indicate the building's thermal capacity per unit floor area.

Thermal envelope – The insulated external fabric of the building. Useful space heating energy the amount of heat actually put into the heated space.

U-values – U-values measure how effective a material is an insulator. The lower the U-value is, the better the material is as a heat insulator. U Values are expressed in Units of W/m²K (Watts / m² per Kelvin).

UKCMB – UK Centre for Moisture in Buildings, a network and knowledge base for moisture in buildings.

VCL – Vapour Control Layer.

VOCs – Volatile organic compounds such as cigarette smoke.

W – Watts, the unit of power (or Joules (energy) per second).

WER – Window Energy Rating.

WLCA – Whole Life Cycle Analysis – the total cost of a measure including the capital cost, the reduction in fuel bills and the associated maintenance costs over the lifetime of the measure or building.

WUFI – A complex modelling software for modelling moisture movement in building construction. Suitable for moisture open or moisture closed designs.

WWHRS – Waste Water Heat Recovery System.

XPS – Extruded polystyrene. A closed cell rigid insulation.

y-value – A measure of all of the thermal bridges in a dwelling as used in SAP calculations.

Zoning – When the heating system of a house is set up or changed such that different areas are heating at different times and to different temperatures it is called zoning. The saving benefits can be large as you are essentially reducing the house volume every time you aren't heating a room.

ψ (psi) value – The heat loss per unit length of thermal bridge. Units W/mK.

λ (lambda) value – The thermal conductivity of a material. Units W/mK.

X (chi) value – Point thermal bridge heat loss coefficient. Units W/K.

μ -value – The Mu value is the resistance of a material to water vapour relative to air, it has no units and is independent of the thickness of the material.
