

Addressing Energy use in Victorian and Edwardian Buildings

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Victorian 1837 to 1901



Edwardian 1901 to 1910



38% of buildings in UK originally built before the 1st World War

Very few have not been modified

Most likely to be occupied

Have planning and conservation issues

Neighbouring buildings

Fixed orientation



Understanding your building is important

Characteristics of older properties

Traditional Masonry Construction - solid walls

Suspended timber floors

Bay windows

Timber windows (original or replacement UPVc?)

Pitched roofs – flat roofs – no roofs....

Condensation – air bricks – direct to outside

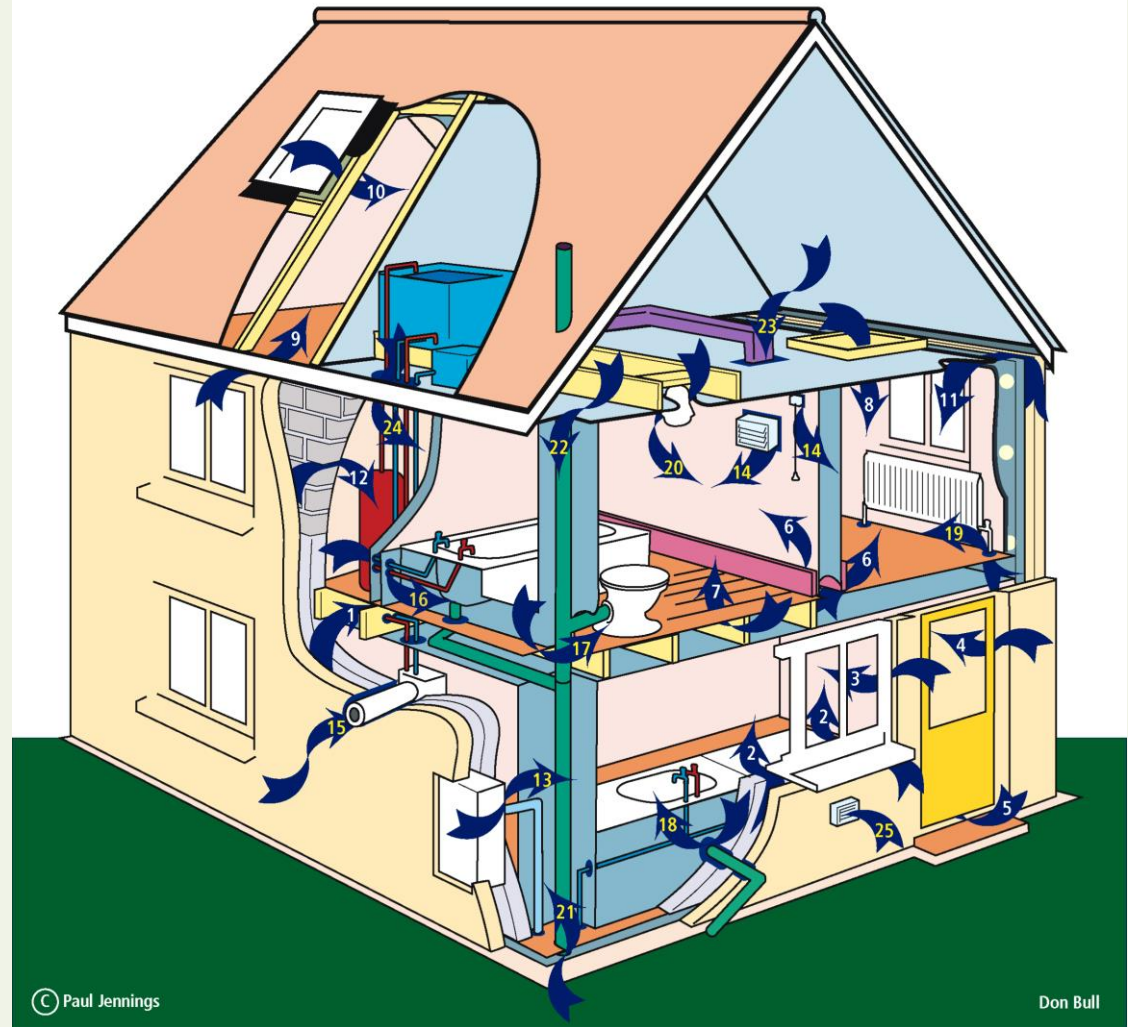
Open fires and chimneys, often badly blocked

Dodgy energy systems!



Complex buildings with many different scenarios

All buildings leak energy in more ways than one!



© Paul Jennings

Don Bull

What uses the most energy?

Heating and cooling: 45-50%

Water heating 12%

Lighting: 9-12%

Refrigerator: 8%

Washer and dryer: 5%

Oven: 3%

Dishwasher: 2%

TV: 2%



Retrofit – where do we start?

Budget

Timing

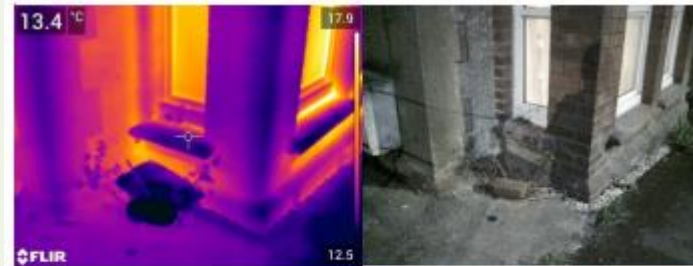
Specification

Pre improvement Air leakage testing

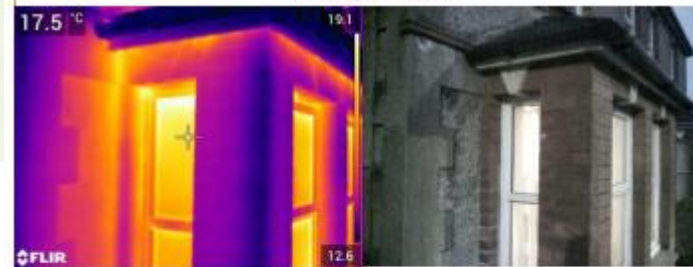
Thermographic survey

Measured Building Survey

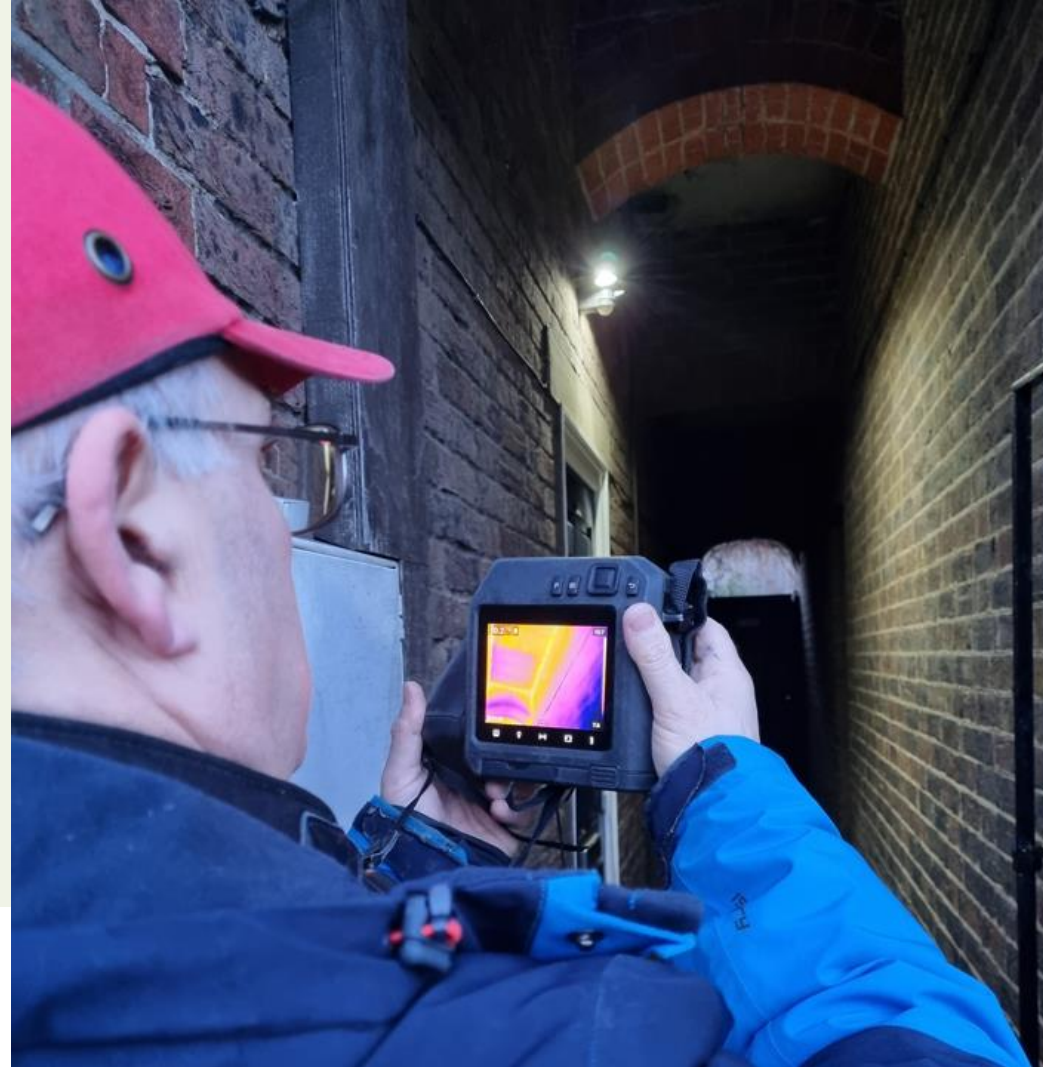
Getting your building retrofit ready



3.1.4 External thermographic image after pressure applied, with corresponding photograph. Showing substantial leakage at base of front bay window



3.1.5 External thermographic image after pressure applied, with corresponding photograph. Showing substantial leakage at top of side window to front bay



Retrofit ready can use 25% of your budget!



Reduce your energy consumption with a whole building approach

Building fabric

Air tightness/leakage

The right sort of ventilation

Doors and Windows

LED bulbs

Occupant behaviour

Building services

Appliances

Renewables

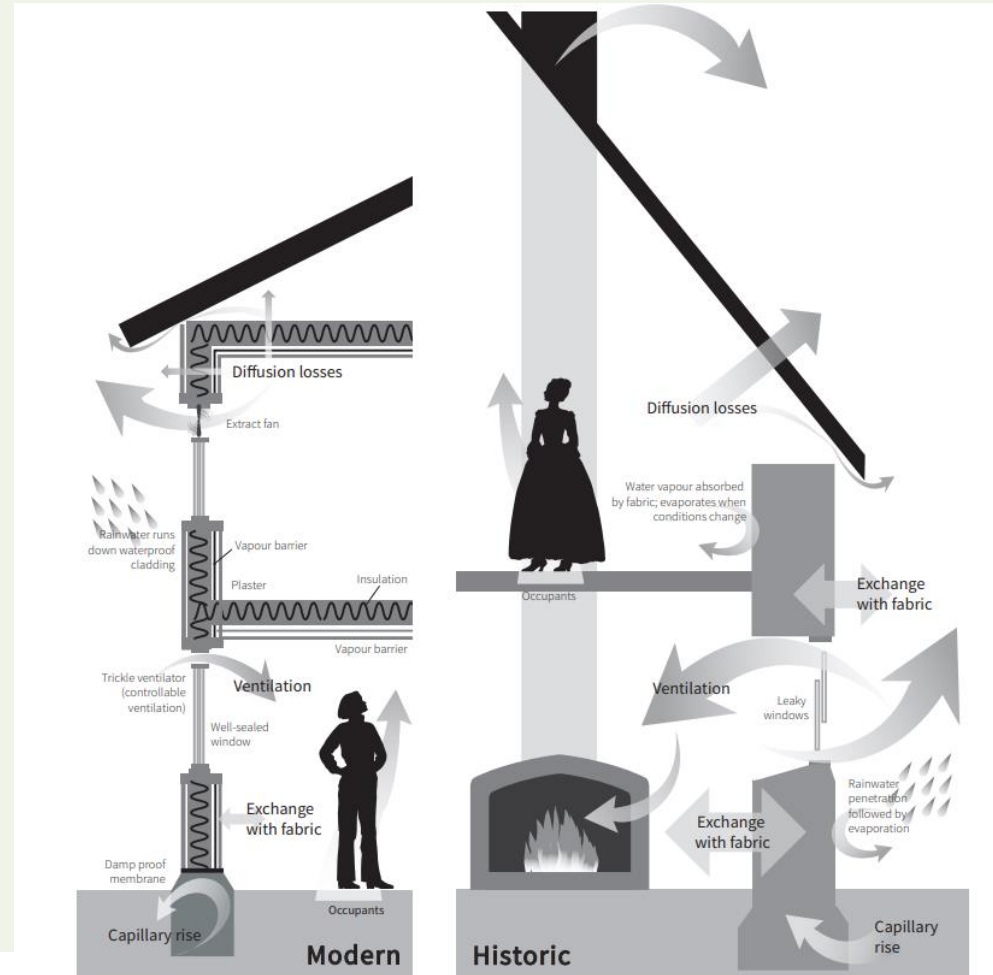


Be aware of the difference between modern construction and older buildings

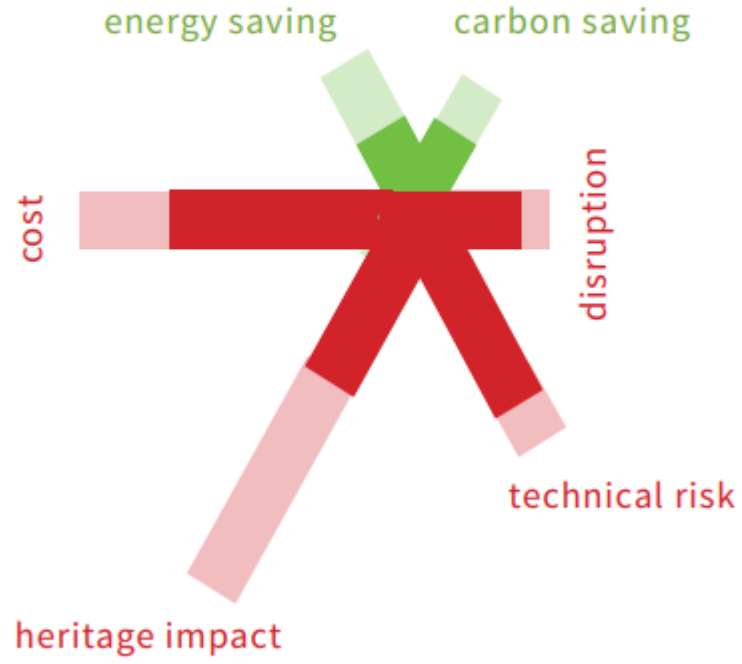
Modern heating at 21 degree air temp can hold 3 times as much moisture in the air as when unheated.

Condensation forms on any surface at 13 deg temperature or below

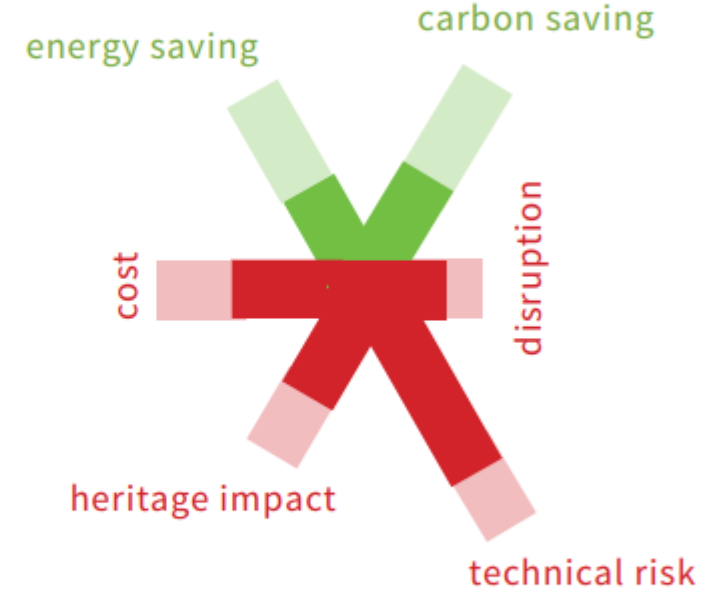
Air quality and mould growth are significant health factors in historic properties



REPLACE GLAZING WITH DOUBLE GLAZING



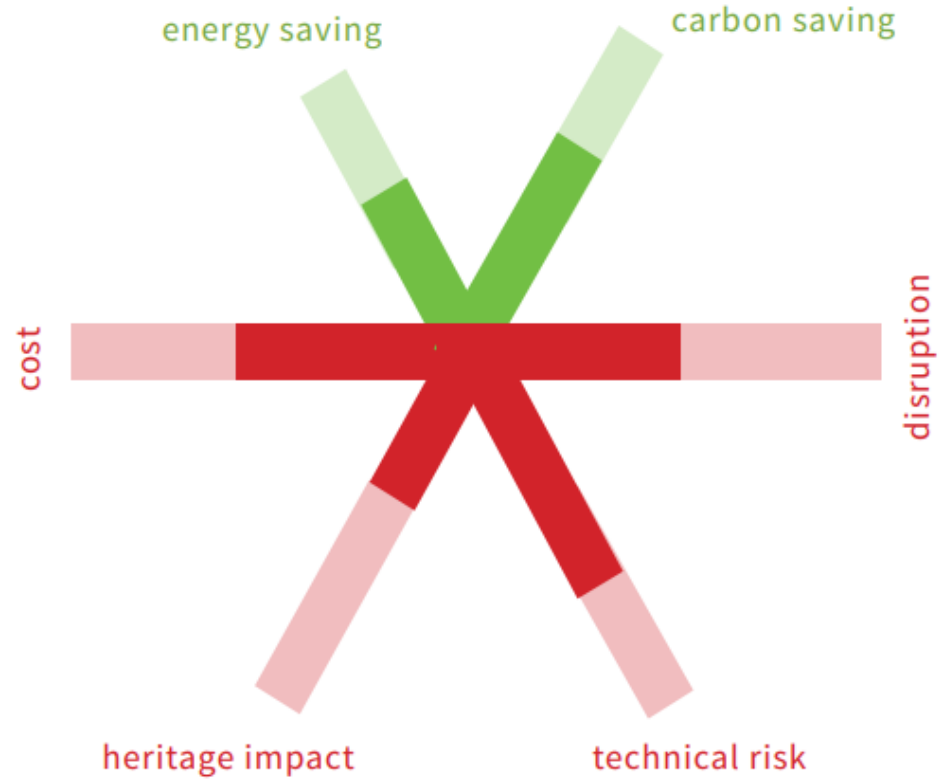
DRAUGHT SEALING



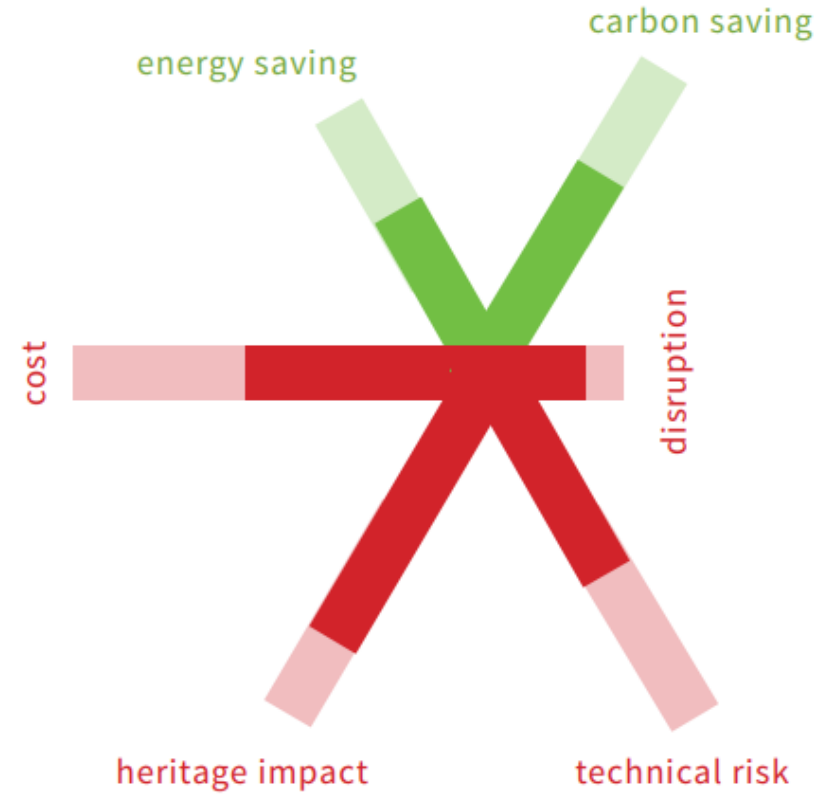


Source Historic England HEAG039

INTERNAL WALL INSULATION



EXTERNAL WALL INSULATION



Retrofitting in practice



Retrofitting in practice



Retrofitting in practice

“Quality-Approved Energy Retrofit with Passive House Components”

The goal was to create a standard for an economically and ecologically optimal energy retrofit, for old buildings that cannot achieve Passive House Standard with reasonable effort. (PHI)



Thank you for listening

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