

# Resilient Building Toolkit Adaptation Measures Factsheet

## **Name and description of measure: Insulation and draught proofing the fabric of the building**

The building fabric refers to the ceiling, walls, windows, floors and doors of a building. Optimum design of building fabric can minimise potential heating requirements, which may lead to the downsizing of heating systems or sometimes eliminate the need for them at all.

Typically, two thirds of the heat generated in a building is lost through the building fabric itself. The remaining third is lost through gaps and vents in the fabric which allow warm air to leave and cold air to enter the space (either deliberately through ventilation or uncontrolled through gaps and cracks). The rate at which heat is lost depends on:

- The temperature difference between the inside and outside of the building
- The insulation properties of the building fabric
- The amount of fresh air entering the building either by controlled ventilation or through poorly fitting windows, doors or joins in walls

Therefore increasing insulation properties either with, cavity wall, roof, solid wall or underfloor insulation and controlling air tightness of the building from poorly fitting windows, doors or joins in walls will reduce requirement for mechanical heating. Opportunities for draught proofing and adding insulation include:

- When cladding needs renewing.
- When windows/doors need replacing.
- When replacing flat roofs.
- When replacing suspended floors.

## **Cost of measure (high, medium or low):**

It is estimated that around 10-15% of total energy costs is wasted by heat losses through the building fabric, but significant savings are achievable through the implementation of some simple energy efficiency measures, including:

- Increased insulation = low cost, 1-4 years payback
- Replacement windows & doors = medium cost

## **Pros and Cons:**

### **Pros**

Reduced energy costs as a result of minimising the loss of treated (heated) air.

Easy win, heat retention in spaces where it is needed, significant on-going cost savings.

Better temperature control – it can prevent overheating.

Improved productivity – the output and morale of the people in the building can be enhanced by providing a more comfortable working environment through reducing draughts and noise.

Lower capital expenditure – a more efficient, well-insulated building needs smaller heating systems.

Good investment – better insulation can increase the buildings value and attractiveness.

### **Cons**

Increase in airtightness and increasing thermal improvements to fabric elements can sometimes result in buildings overheating.

Changes to heating, ventilation and occupancy patterns not foreseen at the design stage can lead to condensation.

There can be issues with insulating older buildings.

Solid wall insulation can be expensive and time consuming to fit.

**Effectiveness of measure (high, medium or low):**

Increasing insulation and controlling air tightness in a building can provide a highly effective solution for reducing the requirement for HVAC.

**Product review site:**

Carbon Trust: [http://www.carbontrust.com/media/19457/ctv014\\_building\\_fabric.pdf](http://www.carbontrust.com/media/19457/ctv014_building_fabric.pdf)

Energy Saving Trust: <http://www.energysavingtrust.org.uk/Insulation/Roof-and-loft-insulation>

**Contact:**

Both Winchester City Council and the University of Winchester have extensive experience in this area. Contact Paul Cook Energy Manager Estates or Mat Jane Energy and Environment Manager.