

# Making energy improvements in community buildings

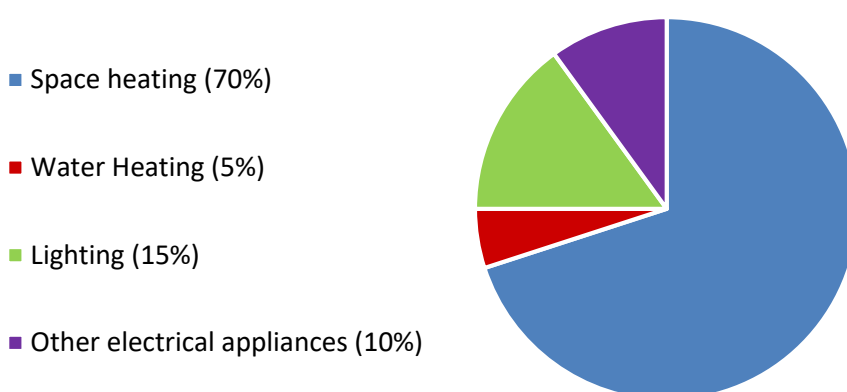
## Introduction

This guidance is designed as an introduction for those wanting to make energy improvements to their community building – whether that be a scout hut, church or village hall. As well as reducing energy bills and cutting carbon emissions, if your community building is warmer and more comfortable to use, more people will want to use it – something you’re probably keen to see happen.

The following pages will: outline the key changes that can be made in buildings to improve their energy efficiency; explain some of the key things you should consider when making building changes; take you through practical steps to understand options and build an action plan; and signpost you to where on the CSE advice site (<https://www.cse.org.uk/my-home/advice/>) you can get further information.

Every building is different, and energy use in a specific building will depend on a range of factors such as the building fabric, whether any modifications have been made to the building over time, how the building is used, and the heating systems and appliances that are used. In an average building, space heating accounts for the vast majority of energy use, as shown in the chart below. This is worth bearing in mind when you are looking at ways to increase energy efficiency: improving how well the building retains heat and how it is heated, are likely to have a far bigger impact, both on reducing your costs and your carbon footprint, than changes made to lighting, appliances or water heating.

### Energy use in a typical community building



## Involving the right people

You may already have a small group of people involved in discussing energy use in the building. We recommend that this core group includes the building owner (if that’s not you). We also think it can be valuable to get a wider group of people engaged from the start, such as building users and even local

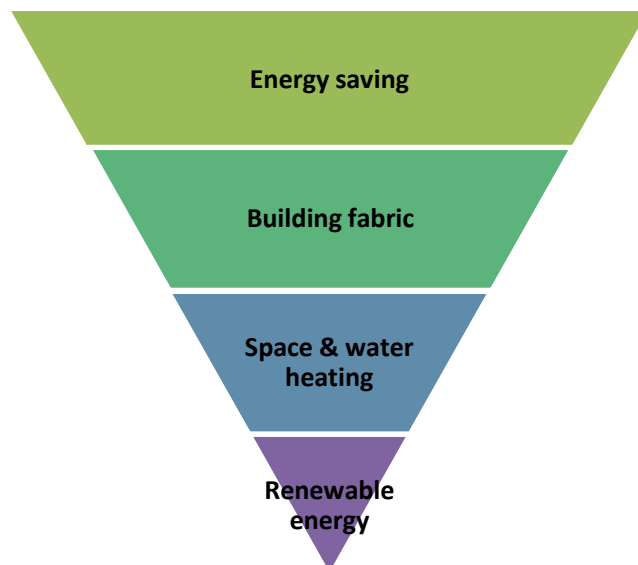
tradespeople who can help you with plans, including estimating costs. Involving the right people, and making sure the concerns of your group, organisation or community are represented, will help you to achieve changes.

We recommend that you communicate with the wider community about your plans to make building improvements. If you do this from the beginning, this will let people know that you want to make the building a nicer place to be – and that improvements are necessary to ensure energy bills are affordable going forward. This broader publicity could in turn lead to more people wanting to become involved in making it happen or providing donations. You could submit an article to a newsletter or local paper, get a mention on a local radio station, or maybe there are local groups or meetings where you could give a short talk on your plans. Once you have established these communication links you can then continue to provide regular progress updates, outlining changes you have made and the benefits you are seeing.

## What improvements can be made in community buildings?

There is often considerable scope for making energy improvements to community buildings, ranging from low cost and simple changes through to larger scale physical improvements which may be complex and costly. There are fewer grants and subsidies available for community buildings than for homes, but ways to fund improvements are explained in [our funding guidance document](#).

We have broken down the improvement options following this energy hierarchy, which is the ideal order in which to consider and make changes in your building: first you look to introduce energy saving behaviours and low-cost measures; next you address the energy efficiency of the building's fabric (the walls, floor, roof, windows and doors); then you look at your heating and hot water; and finally, you consider renewable energy. Of course, there will be reasons for why you may not follow this order – funding; building constraints; your boiler breaking – but this is the ideal order.



### 1) Energy saving behaviours & low-cost measures

A key part of saving energy in your building is behaviour change. Your building may be occupied through the day by members of staff and building users, or it may only be occupied for a few hours each day by different groups. However your building is occupied, there is significant potential to reduce the building's energy demand simply through ensuring that these people understand how to use the heating, lighting and electrical appliances in the building effectively. This could be as simple as switching off heaters and appliances when not in use, closing doors and windows, or understanding and using controls to manage temperatures and timings effectively. For a list of energy saving tips, see [CSE's factsheet](#).

For further information on heating and hot water controls see [CSE's factsheet on central heating controls](#). Raising awareness of these issues could be achieved at little or no cost through things like training sessions, placing signs around the building, and holding public energy awareness days.

You could also use an energy monitor to make users aware of how much energy they're using, and it could act as a prompt to switch appliances and lights off after use. For more information on energy monitors see [CSE's factsheet](#).

Alongside behaviour changes, there are low-cost energy-saving measures that you could consider:

- **Insulate boiler and pipework** – depending on your building, there are low-cost and simple improvements that can be made to reduce heat being lost from the water in your heating system. If you already have a boiler 'jacket' check its thickness – it should be at least 80mm.
- **Draughtproofing** – on average 15% of a building's heat is lost through unwanted draughts, so tackling this is a no-brainer! You can draughtproof doors, windows, loft hatches, letterboxes, and gaps between floorboards. For further information see [CSE's factsheet on draught proofing](#).
- **Efficient lighting** – the choice available when buying new lightbulbs can be dizzying, so for further information and advice about what bulb you need and what your choices are see [CSE's factsheet on lighting](#). Primarily LEDs are the most efficient bulb available, but the choice here can also be overwhelming – for a very thorough guide through LEDs see this brilliant blog: [www.wearepossible.org/actions-blog/everything-you-wanted-to-know-about-led-light-bulbs-but-were-afraid-to-ask-1](http://www.wearepossible.org/actions-blog/everything-you-wanted-to-know-about-led-light-bulbs-but-were-afraid-to-ask-1).
- **Efficient appliances** – where appliances need replacing make sure replacements are the most efficient available (i.e. A rated or higher); ensure energy saving settings are used on computers; and use programmable on/off timers where appropriate.
- **Efficient water use** – fit water saving devices to taps; install dual-flush toilets or put toilet 'hippos' in cisterns; fix leaky taps and pipes; install rainwater harvesting.

## 2) Building fabric

When we look at where heat is lost from an average building, the biggest chunk is lost through the walls, and then the roof and floor, and finally the windows/doors. To reduce heat loss from these building components, listed below are the key improvements that could be considered:

- **Wall insulation** – cavity wall insulation, and internal/external solid wall insulation.
- **Roof insulation** – at the joist level in a flat roof, or between/on top of rafters in a pitched roof.
- **Floor insulation** – options include insulating between or under timber floor joists, or insulating above/below a concrete floor.
- **Windows & doors** – install efficient glazing and high-performance thermal doors (and if this is beyond your budget make sure you have thermal curtains).

Your building's characteristics – what the walls are made of, how the floor is constructed, what form your roof takes, your building's heritage value – will shape what measures are most appropriate for your building. There are also key design factors that need to be considered when making fabric changes, which are summarised in the 'Key Considerations' section below. For further information on all the above measures see <https://www.cse.org.uk/my-home/advice/>.

### 3) Space & water heating

Once you've made your building as thermally efficient as possible, then it's time to start thinking about the devices that heat the space and water within the building. Listed below are some key things you could consider:

- **Efficient boiler/heating system** – this could be a low-carbon option (e.g. a heat pump).
- **Room heaters** – depending how your building is used you could explore using room heaters to heat small spaces for short periods. For an explainer of the options see [CSE's factsheet on room heaters](#).
- **New heating controls** – e.g. timers, programmers, thermostatic radiator valves. You could also consider smart heating controls, which enable you to control your heating system via an app on your smartphone or tablet; this may be particularly beneficial if your community building isn't occupied by staff during the day and where building users let themselves in/out of the building independently.
- **Point-of-use water heaters** for your kitchen. Depending on your hot water set up, these can be a more efficient option than piping hot water from a central gas or oil boiler.

A note on night storage heaters: if your building is heated using these then you are likely to be on an Economy7 electricity tariff. On this tariff, electricity used overnight (off peak) will be cheap, but electricity used during on-peak hours will be very expensive – not a great tariff for community buildings which are generally used during the day and early evening! If this applies to your building, we recommend that you explore other heating options.

### 4) Renewable energy

If feasible make sure you are on a 'green' tariff – this means buying your energy from a truly renewable energy supplier. We consider Good Energy, Ecotricity and Green Energy UK to have the greenest tariffs. For further information on 'green' tariffs see <https://www.cse.org.uk/advice/green-electricity-tariffs/>.

In terms of generating your own energy, it's always best to reduce energy use and increase your building's energy efficiency as much as possible before considering renewable energy. However, generating your own renewable energy will reduce your building's carbon footprint and, if used well, reduce running costs. The key technology you're likely to consider is solar PV on your roof, but you may also look at solar thermal or a biomass boiler. For further information on different renewable technologies see <https://www.cse.org.uk/my-home/advice/>.

## Key considerations when making building improvements

### 1) Maintenance first

Maintaining your community building is a key part of ensuring it is working as effectively as possible. For example, rotten window will let in draughts; cracks in render or guttering may lead to penetrating damp which in turn makes it harder to heat well. Maintenance should be done before undertaking larger energy efficiency improvements; if existing issues aren't tackled then you run the risk of undoing energy efficiency improvements or improvements not working effectively.

### 2) Moisture, damp & ventilation

All buildings create moisture – from the kitchen, bathroom, even the building users themselves. If you are making energy efficiency improvements to your building be aware that this will likely impact how your building currently copes with moisture – and remember that how your building does this may be obvious and managed (e.g. through extraction fans), but it may also be less obvious and unmanaged through moisture-open materials and draughty doors! Fundamentally you want to decrease the level of unwanted infiltration (draughts) and increase the amount you are deliberately ventilating moisture out of the building, to a level that suits your building's demands. This will decrease the risk of issues like damp, make the building more efficient to heat, and make it a more comfortable place to be.

### 3) Permissions

Some energy efficiency improvements will require a form of permission. This will likely just be building regulations approval (given through the 'building control' system), but you may also need to get planning permission. If your building is listed or in a Conservation Area – you can check this via your local authority's website – you'll need to check how this affects what you're allowed to do, especially if you're changing the external appearance of the building. The planning portal website is full of information and guidance: [www.planningportal.co.uk/](http://www.planningportal.co.uk/). If you think you may need planning, we recommend you speak with your local planning department – this may come at a cost but this will likely be small relative to the full project costs and will ensure you understand what you need to do to secure permission.

## Understanding options and developing an action plan

### Building audits

It may not be obvious which improvements and changes will make the biggest impact on energy use in your community building. An energy audit will help you understand how energy is being used and identify the most effective improvements. Audits come in varying levels of detail and cost, and as a simple rule of thumb, the bigger your building and the more significant the changes you're considering making, the more important it is to have a detailed and professional audit.

- **Self-completed audit:** the CSE Energy Survey can be used as a guide to identify possible

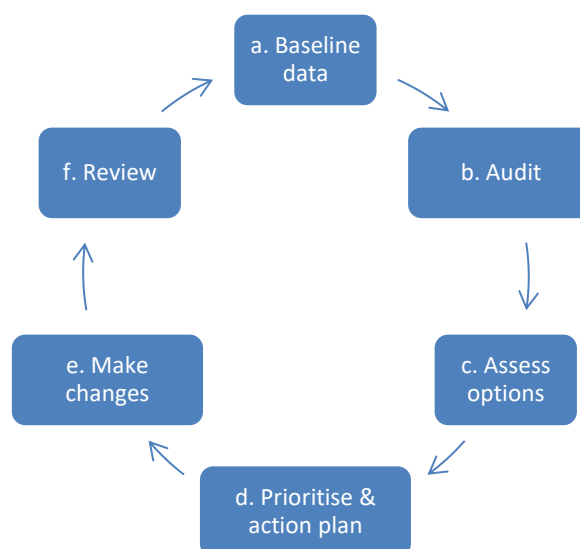
improvements <https://www.cse.org.uk/resource/energy-survey-for-community-buildings/>. You could also do a thermal imaging survey of your building to clearly see where it is losing heat – some community organisations and local authorities have thermal cameras you can borrow.

- **Display Energy Certificate (DEC):** larger public buildings (over 1,000 square metres) will have a DEC, showing the building’s energy use, carbon emissions and recommended improvements. Check if your building has one here [www.gov.uk/find-energy-certificate](http://www.gov.uk/find-energy-certificate)
- **Professional building audit:** this will be a detailed audit of your building and should consider detailed design factors such as ventilation, and how to mitigate any potential risks. Again, seek out recommendations for a good building assessor.

## Action planning & making changes

Here are some recommended steps to take you along the journey of beginning to understand your building and collect baseline energy consumption data, through to monitoring the impact of changes made.

- a. **Compile baseline data:** look at your energy bills to understand your consumption levels and patterns; monitor energy consumption using meter readings and plug-in monitors; compare temperatures in the building; look at how and when the building is used; get feedback from building users. Tracking building and energy use will show you when the peaks and troughs are in energy use and whether there are obvious things to address, such as how timers and controls are used. To note, if you choose to have a professional audit done the assessor may compile some of this baseline data.



- b. **Get a building audit done:** you may choose to have a professional audit done; even if this is the case we recommend you use CSE’s Energy Survey to do a walk-around audit of your building so that you develop a better understanding of your building.
- c. **Assess options:** using the information you’ve collected along with the results of your building audit, consider the potential improvements and changes that could be made. These could be free / low-cost / high-cost options and their relative costs, carbon savings and anticipated fuel bill reductions can be calculated to help with prioritisation. To get an accurate idea of the cost of physical improvements you will need to get some quotes.
- d. **Develop an action plan:** write an action plan and use it to allocate responsibilities and timings to implement improvements to the building, as well as identify the potential resources needed (£

and time in days). You can identify short-, medium- and long-term actions depending on your capacity and resources, but it is worth planning for some 'quick wins' (this is good for project morale and community publicity!). Other factors that you may want to consider in your plan are awareness raising within the building, marketing and publicity, and funding.

**e. Make changes!**

- f. **Monitor and review:** it's unlikely that all the changes you'd like to see will be possible at once so the action plan should be regularly revisited and updated. To see how effective any changes you have made have been, regular and ongoing checks of energy use data are really important. Remember to communicate your findings to your building users and wider community as part of your ongoing publicity.

## Finding an installer

One of the key challenges to making energy efficiency improvements to your community building may be finding an installer to work with. As with all building work, key things you can do to find a good tradesperson include: get recommendations from others who've made changes to their non-domestic buildings; search for online reviews and ratings; get at least 3 quotes, with which each detailing the costings of all elements of the work; speak to previous customers; and use installers that are certified (see below for a list of recognised bodies involved in certification / accreditation / guarantees of energy efficiency and renewable energy products).

**The National Insulation Association** is a trade body for the insulation trade, covering cavity wall, loft, solid wall and floor insulation, as well as draught proofing. <https://www.nia-uk.org/>

**The Insulated Render and Cladding Association** is a trade body covering the external wall insulation trade. Members are listed so you can find an installer near you.

[INCA - Leading the External Wall Insulation \(EWI\) Industry in the UK \(inca-ltd.org.uk\)](https://www.inca-ltd.org.uk/)

**Microgeneration Certification Scheme.** Certification body for low-carbon energy technologies and contractors. You can also find local installers of any of the technologies on their website.

[www.microgenerationcertification.org](https://www.microgenerationcertification.org)

**The Cavity Insulation Guarantee Agency (CIGA)** provides independent 25 year guarantees for Cavity Wall Insulation fitted by registered installers. [www.ciga.co.uk/](https://www.ciga.co.uk/)

**The Solid Wall Insulation Guarantee Agency (SWIGA)** provides technical guidance and an independent 25-year guarantee for solid wall insulation systems fitted by approved installers.

[www.swiga.co.uk/](https://www.swiga.co.uk/)

**Federation of Master Builders** is the UK's largest trade association in the building sector.

[www.fmb.org.uk/](https://www.fmb.org.uk/)

**Green Register** is an independent, not-for-profit which trains construction professionals in building better, more sustainable buildings. They have a Register of construction professionals –

[www.greenregister.org.uk/the-register/](https://www.greenregister.org.uk/the-register/)

## Other sources of information

Carbon Trust website [www.carbontrust.co.uk](http://www.carbontrust.co.uk) provides information about energy saving measures for buildings, and a range of publications and good practice guides are available for download if you sign up as a member.

Energy Saving Trust website gives advice on energy saving measures in the home and the potential cost savings of making improvements, many of which are applicable for community buildings [www.energysavingtrust.org.uk](http://www.energysavingtrust.org.uk). They also have some community pages with case studies and good practice guides for running community projects.