

# Energy Efficiency in Community Buildings

One of the largest expenses for community buildings are the energy and utility costs. There are often simple and inexpensive techniques that can be applied to reduce your outgoings.

**Don't forget** - Your charity should pay a reduced rate of VAT of 5% on fuel and power - (gas and electricity) - that you use for non-business activities. It can also pay reduced rate VAT on maintaining equipment connected with the supply.

<http://www.hmrc.gov.uk/charities/vat/fuel-power.htm>

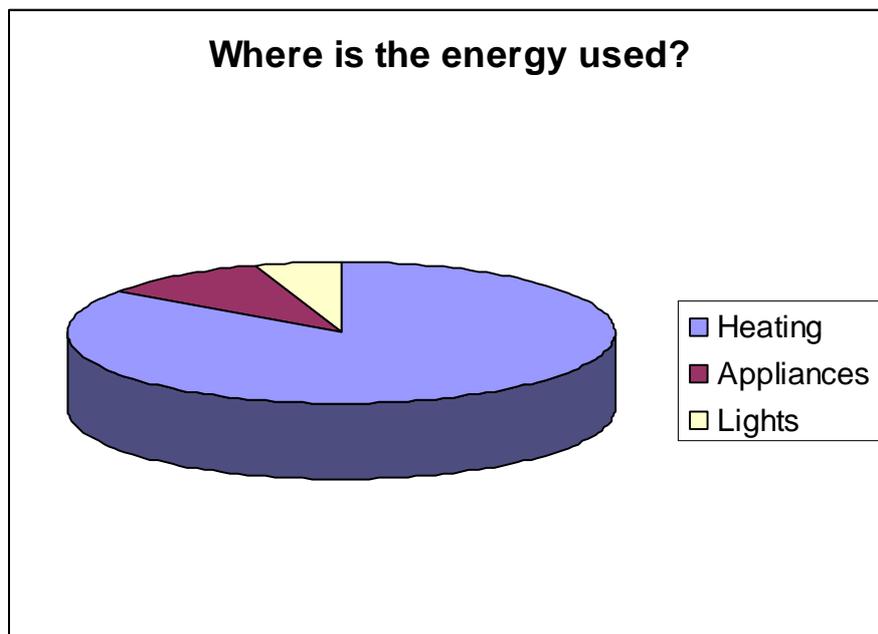
There are a great deal of free advice and resources available to organisations and individuals from Southampton Environment Centre <http://www.environmentcentre.com/>, National Energy Action <http://www.nea.org.uk/> or the Carbon Trust <http://www.carbontrust.co.uk/Pages/Default.aspx>

- First steps
- Energy audits
- Efficiency of systems/ appliances
- How to calculate running costs
- How to calculate and reduce CO<sub>2</sub> and carbon emissions
- Quick wins for improving your energy efficiency
- Reducing energy usage
- Alternative fuel sources
- Working with your community

## First Steps

It is important to recognise where most of your energy is used (see below). 85% of the energy is used on heating with only 5% on lighting and 10% for all other appliances. Therefore reduction in heating costs will probably have the most significant impact on reducing costs. Although considering your energy use holistically is the best approach.

**Don't forget** you can use comparison sites to find out if you are getting the best price for your fuel.



## **Carrying out an energy audit**

The first step to reducing your energy costs is to carry out an energy audit of your building and its activities.

National Energy Action have been doing a great deal of work with community buildings and have produced an excellent document that includes technical notes, walk through survey sheets, further information and case studies. This would be a good starting point for you to consider the way forward for your building.

<http://www.nea.org.uk/assets/Publications/Publication-Files/EnergyEfficiencyinCommunityBuildings.pdf>

It is important that you consider the activities taking place as well as the fabric of the building. You will probably need less heat in a room that is used for dancing than one that is used for playing chess to ensure the users are comfortable.

## **Efficiency of Systems/ Appliances**

To give you a comparison of the cost of running a variety of appliances New Forest District Council have produced a chart (be aware that changes in tariffs will not be reflected in this)

<http://www.newforest.gov.uk/index.cfm?articleid=5871&articleaction=dispmedia&mediad=4959>

All electrical appliances and electrical gadgets have a rating known as their wattage. This can normally be found on a small plate on the appliance itself. This is the information you need to calculate the cost of running your appliance. The greater the wattage and the longer it is left on the more expensive it is to run. Appliances with high wattages tend to be those like dish washers, washing machines and tumble dryers. Other low powered appliances like fridges, freezers and TV's that are used constantly over the year may use a lot of energy too.

## **How to calculate the running costs**

Example: A 650 watt microwave cooking for 15 minutes. Based on a unit of electricity costing 8p (take a look at your electricity bill to find an exact amount.

$(650 \text{ watts divided by } 1000 \text{ watts}) \times (15 \text{ minutes divided by } 60)$   
 $= 0.16\text{kWh} \times 8\text{p} = 1.3 \text{ pence}$

The New Forest website also contains information to help you understand the energy information on all new appliances and details of the strategies you could consider to address problems you face. <http://www.newforest.gov.uk/index.cfm>

The table below indicates the efficiency of a variety of heating systems (percentage of heat produced for the amount of energy input). REMEMBER this does not equate to costs, as although direct electric heaters are efficient they use high amounts of energy to run.

|   |      |
|---|------|
| Gas system 20 years old                 | 60%  |
| Oil system 20 years old                 | 55%  |
| Solid fuel system 20 years old          | 55%  |
| Electric system                         | 75%  |
| Direct electric heaters                 | 100% |
| Gas/ oil 2 years old                    | 85%  |
| Biomass system                          | 85%  |
| Renewable energy (air source heat pump) | 300% |

An air source heat pump uses some electric power to drive the pump, but the heat it gathers from the air enables it to be 300% efficient.

The table below gives an estimate of how much carbon dioxide and carbon is produced from each of the fuels based on spending approximately £1000

| <b>Fuel</b>         | <b>CO<sub>2</sub> (tonnes)</b> | <b>Carbon (tonnes)</b> |
|---------------------|--------------------------------|------------------------|
| Heating Oil         | <b>7.5</b>                     | <b>1.9</b>             |
| Bottled Gas         | <b>5.1</b>                     | <b>1.3</b>             |
| Solid Fuel          | <b>12</b>                      | <b>4</b>               |
| Electric (on-peak)  | <b>5</b>                       | <b>1.7</b>             |
| Electric (off-peak) | <b>15</b>                      | <b>3.75</b>            |
| Mains Gas           | <b>10</b>                      | <b>2.5</b>             |
| Wood                | <b>0</b>                       | <b>0</b>               |

This shows that on peak electric heating is the most expensive followed closely by bottled gas and oil. Mains gas remains the least expensive to use and because of this produces more carbon per £1000.

As long as wood is purchased within a few miles of where it is used (keeping transport to a minimum) it will be carbon neutral, and not increase carbon into the cycle.

If you want to know more take a look at the Winchester Action on Climate Change website that has a vast array of information.

<http://www.winacc.org.uk/>

### **How to calculate and reduce CO<sub>2</sub> and carbon emissions**

- Identify fuel costs for year
- Identify percentage use for each fuel, and costs
- Calculate CO<sub>2</sub>/carbon usage
- Identify potential to reduce energy

Simple really, but these four bullet points will all need some research. There are some inexpensive actions that could be taken straight away, if they are appropriate to your building.

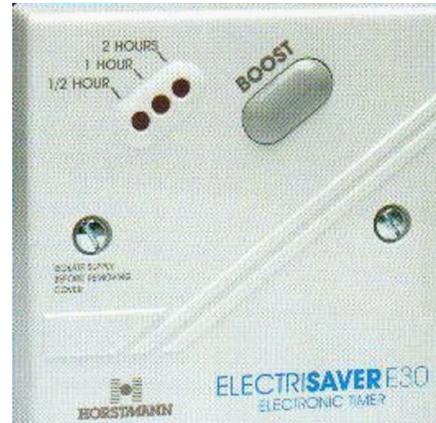
### **Quick wins for improving your energy efficiency**

- Install roof and wall insulation (and possible floor depending on the construction of your building) The recommended thickness for roofs is now 270mm of mineral wool insulation. 100mm between the ceiling joists and 170mm laid over the joists.
- Fit foil behind the radiators on outside walls - Cost £10 payback time 1 - 2 years
- Draught proof windows, doors, letterbox and keyhole - Cost £50 payback time approximately 2 years

- Fill gaps between the skirting boards and the floor - Cost £10 payback time approximately 1 year
- Use energy saving light bulbs - Cost £5-10 payback time approximately 1 year
- Lag hot water pipes - Cost £10 payback time approximately 2 years
- Fit a jacket to your hot water tank - Cost £10 payback time approximately 1 year

## Reducing Energy Usage

- Improve appliances – modern appliances are usually more energy efficient. Take an inventory of what you have and decide if you need to upgrade to save energy
- Improve controls – the switch shown here allows room users to have a quick boost of heat (by simply pressing the button), but your heater will no longer be left on overnight!
- Reduce heat loss – this could be as simple as ensuring doors are kept shut or maybe creating a lobby and double doors to your building (if feasible)
- Reduce unwanted ventilation – cut down those drafts, even a warm room feels colder if you are sitting in a draft.
- Consider how your light controls work – do all the lights need to be on, or can you have them re-wired so that only a few can be used at a time reducing costs.



Horstmann E30 Boost Timeswitch  
Cost approximately £30

## Alternative Fuel Sources

Once you have reduced energy loss, are using energy efficient appliances and made the alterations to the way your building is used, you might want to consider installing alternative technology to generate some of your energy needs.

This technology is still quite expensive so you need to be aware of the savings you can make and how long it will take to recover your initial investment in fuel cost savings. However, if you can get grants to cover your costs this will become less important as you will be making savings straight away.

To find out more about funding opportunities you can contact Southampton Environment Centre <http://www.environmentcentre.com/> or National Energy Action <http://www.nea.org.uk/>



You could also apply to our Capital Buildings Partnership funding

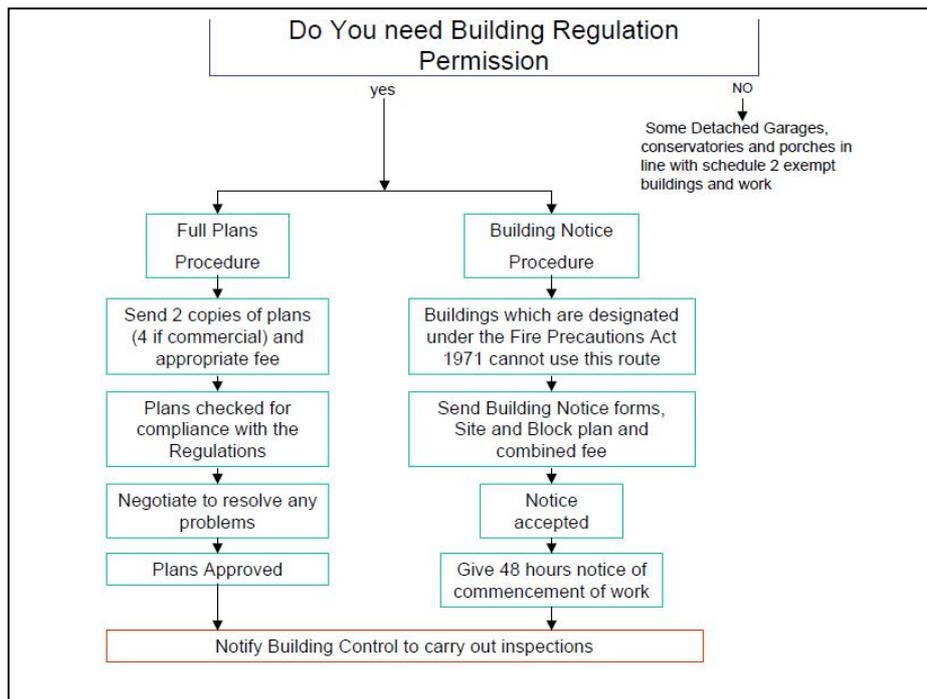
<http://www3.hants.gov.uk/community-support-service/community-funding/community-buildings-partnership-funding.htm>

National Energy Action and Southampton Environment Centre can also give you impartial advice so it would be worth contacting one of these organisations as a starting point as they may be able to save you time and effort by sending you in the right direction.

Simple matters like, do you live in an area that is windy enough to make a wind turbine viable, are really important. You can find this out on the Department of Business Innovation and Skills website, which also gives other information about the viability of wind turbines. N.B. The wind speed would probably need to be above 10 metres/sec to make it viable.

[http://www.decc.gov.uk/en/content/cms/meeting\\_energy/wind/windsp\\_databas/windsp\\_databas.aspx](http://www.decc.gov.uk/en/content/cms/meeting_energy/wind/windsp_databas/windsp_databas.aspx)

It would also be good practice to find out if there are any planning restrictions to any work you are proposing before you get to far along with your plans. The Borough and District websites would be a good place to start and often your queries can be answered by phone. The chart below applies to some work, but by talking to your local planning department you will get a better idea of the planning requirements and implications of what you want to do.



**In Summary – there is lots of free and impartial advice out there, make sure you understand the implications and savings before you make any decisions**

**Working with your community**

If you are contemplating developing the energy efficiency of your building then why don't you take your community on this journey as well, helping your whole community to reduce their carbon footprint. There may be local people who have specific skills to help you with your project and by widening it out to include working within the community the project will often be more appealing to funders.

One inspiring example of this is the work carried out by Winchester Action on Climate Change who's vision is "a more equitable and more enjoyable low carbon society across the district, with healthier happier lifestyles and stronger communities." They have developed a range of activities and sub groups to address the issue of climate change. <http://www.winacc.org.uk/>

There are a wide range of resources to help with this allowing your community to 'think global – act local' <http://www.acre.org.uk/yourcommunitybuildingcounts/index.html>

### **Shared Energy Toolkit**

This toolkit recognises the key role of community organisations in leading the response to climate change, which will be a challenge on every level. The work that you already do in and for your community means that you care about giving people better life chances. You understand the importance of improving people's skills and knowledge, giving people fair access to services and creating healthier, safer places for people to live.

The exercises can be used for organisational planning, as a means of raising awareness with people who use your services or as a way to influence other organisations and policymakers. In particular, the toolkit will help you to think about what you might need to change - or be prepared to change - to help your organisation adapt to climate change and make it more resilient within a range of possible futures.

[http://www.neweconomics.org/sites/neweconomics.org/files/Shared\\_Energy\\_Toolkit.pdf](http://www.neweconomics.org/sites/neweconomics.org/files/Shared_Energy_Toolkit.pdf)

### **A guide to running smart and sustainable events**

<http://www2.btcv.org.uk/EAC%20For%20Our%20Event.pdf>

**Posters** – a wide range of posters and other resources are available to download, or you can get some sent to you FREE

<http://www.carbontrust.co.uk/cut-carbon-reduce-costs/products-services/technology-advice/posters/Pages/energy-efficiency-posters.aspx>