Western Power Distribution Community Chest **Energy Survey**

Heating, lighting and insulation grants for community buildings

Introduction

Western Power Distribution, in partnership with the Centre for Sustainable Energy, has set up a £50,000 grant scheme for communities in the Midlands, South West and South Wales to help reduce their energy use. The aim of the grant scheme is to help community groups carry out simple but effective energy efficiency improvements in village halls and community buildings, after carrying out their own energy audits. The maximum award per group will be £1,000.

This document combines guidance and a checklist to carry out an energy audit of your building and assess the effectiveness of different improvements. You can use it to put together a separate carbon reduction plan for the building (which could include a whole range of free, low cost and higher cost measures) and to decide what to include in your application for a grant from WPD. Read through all three sections of the survey before you start.

Using the Energy Survey

Section 1
This is a checklist for carrying out a walkaround of the community building to help you identify possible areas for improvement. Try to answer each question on the list and for each item, consider whether there are free or costed improvements that would improve the building's energy efficiency. Note: Once you've carried out this walkaround, keep it and review it regularly. It is worth carrying out a walkaround regularly, in different weather and at different times of day.

Section 2
Summarise your comments / findings from the walkaround survey, noting key areas where you think improvements could be made.

Section 3
Look at the guidance on different energy efficiency improvements that you might consider, and the typical carbon savings associated with each. Use this guidance to help you decide which improvements to apply for under the Community Chest grant.

Section 1 Walkaround checklist

Community building and address:

Community group:

Date of survey:

Survey completed by:

Weather (e.g. dry/wet, cold/mild/warm, windy/still, sunny/overcast)

NB Further information on the points in this checklist can be found in Section 3.

A) Insulation and draughtproofing	Comments
Are there any cold draughts from windows or doors?	
Are windows double glazed?	
Does the building have a flat roof or a pitched roof?	
Is the roof properly insulated? (The recommended depth for mineral wool insulation is 27cm)	
Does the building have solid walls or cavity walls? (The pattern of the brickwork will give you an idea)	
Are the walls insulated?	
Are there draughts from the floor? Could the flooring material be improved?	
B) Space and water heating	**Comments**
Is the temperature comfortable? Have there been complaints from building users?	
Is the heating working?	
Are portable heaters being used?	
Is the heating on, but windows/doors open?	
Are there timers? If so, do they work, and are they set for the right times?	

Are thermostats for the heating working and set to the right temperature (19-20°C)?	
Are there any obstructions in front of the radiators or heaters?	
Do the radiators have thermostatic radiator valves? Are they used effectively?	
Is all associated pipework insulated?	
Is heating and air conditioning on at the same time in the same area?	
Is heating or air conditioning on in unused spaces, such as cupboards and corridors?	
Are people in the building dressed appropriately for the time of year?	
Are blinds or curtains closed at the end of the day during winter to cut down on heat loss?	
Is air conditioning on, but windows/doors open?	
Is air conditioning turned off at the end of the day (as early as possible)?	
Are air conditioning thermostats working and set to the right temperature (23-25°C)?	
Are blinds closed during summer to help avoid over-heating?	
C) Lighting	**Comments**
Are lights on in empty rooms/unoccupied areas? (if so, where?)	
Are lights on when daylight is sufficient?	
Are the windows clean?	
Are light fittings clean?	
Are light switches clearly labelled?	

Is external lighting switched off during the day?	
Are low-energy (CFL or LED) light bulbs being used?	
Are lights located in appropriate places?	
D) Appliances	**Comments**
Are computers left on overnight or at weekends?	
Are monitors switched off when not in use and screensavers disabled?	
Are photocopiers or printers left on overnight or at weekends?	
Are photocopiers in a well ventilated area – not where there is air conditioning?	
Are powersave facilities of equipment (e.g. fax machines, printers, photocopiers) activated during the day?	
Do users print/copy double-sided?	
Is a tray of used paper available for printing on the other side?	
Is equipment clearly labelled so that users know how to activate energy-saving features or switch it off?	
Are vending machines and water coolers left on all the time?	
Is the water cooler thermostat working and set to the right temperature (12-15°C)?	
Is the fridge/freezer defrosted regularly?	
Is the fridge/freezer door left open longer than necessary?	
Is the fridge thermostat working and set to the right temperature (2-4°C)?	
What other electrical appliances (e.g. TV, radio, projector, kettle) are regularly used? Could they be used more efficiently?	
Are microwaves switched off at the plug after use?	

E) Water use	Comments
Is the water at the right temperature – not any hotter than it needs to be (60°C)?	
Are there any signs of leaks, or dripping taps?	
Is associated pipework insulated?	
Are taps left running after use?	
Are flushes on toilets and urinals working properly?	

Section 2: Actions to improve energy efficiency

Refer to your comments from the walkaround (section 1) and to the guidance in section 3 (below) and outline the actions that you've identified under each section that could improve the building's energy efficiency. To apply for a WPD Community Chest grant, you will then need to get quotes from suppliers.

A) Insulation and draughtproofing

B) Space and water heating

C) Lighting

D) Appliances

E) Water use

Section 3: Guidance on energy efficiency improvements

A) Insulation and draughtproofing

Energy, in the form of heat, is lost from buildings through the fabric of the building (walls, floors, windows and roof). Warmed air escapes through gaps, mainly around doors and windows, and is replaced by cold air from outside. Look over the whole of the building to establish the situation and pinpoint where insulation and/or draught proofing will help to reduce heat loss. It is important to assess this *before* considering heating, as the energy efficiency of the building fabric will influence choices about heating systems.

Roof insulation

If your roof has little or no insulation then this is perhaps the first measure you should consider as it can be one of the most cost effective. Around a quarter of a building's space heating loss can be through an uninsulated roof and the most appropriate form of insulation will depend on the roof construction. Typical methods are:

- Flat roofs: external or internal insulation using boards or slabs
- Pitched roofs: loose-fill or rolls or insulation about ceilings, or slabs between rafters where there is no ceiling. Insulated suspended ceilings can also be an option.

With a timber roof, it is crucial to allow for adequate ventilation and/or vapour barriers for long term protection.

Typical savings: 10-20% of space heating energy

Wall insulation

Large amounts of heat can also be lost through the external walls of a building. Where cavity walls exist, specialist advice should be sought about filling the cavity with insulating material such as mineral or glass fibre.

Solid walls tend to be harder to insulate. Like roofs, they can be insulated either externally or internally, with the latter usually being the cheaper option. Internal insulation or 'dry lining' typically involves insulated plasterboard applied to wooden batons fixed to the inside wall. An alternative involves sheets of foam-like material which can be glued to the wall.

There's guidance on identifying and insulating solid/cavity walls on the CSE advice website (www.cse.org.uk/loveyourhome).

Typical savings: 10-20% of space heating energy

Sealing gaps around windows, doors or floor skirting

Gaps around the floor, skirting boards, windows and doors can result in cold draughts and significant heat loss so they should be sealed wherever possible, whilst ensuring that adequate ventilation is maintained for spaces that need it.

Typical savings: 10-15% of space heating energy

Double glazing

Windows are generally areas of considerable heat loss and can cause down draughts of cold air. One way to cut down heat loss (and noise) is to install double glazing, either in the form of hermetically sealed units or by adding 'secondary' glazing such a second pane of glass or clear polycarbonate to create an air gap. Curtains and blinds can significantly reduce heat loss by acting as insulators and excluding draughts, particularly if they are made of a heavy fabric and have a thermal lining.

Typical savings: 5-25% of space heating energy

Floor insulation

Installing floor insulation can be disruptive and is not often undertaken as a retrofit measure unless there are significant additional works required such as floor replacement. However, insulation beneath a suspended timber floor is sometimes possible, and where underfloor heating is present insulation is vital to prevent heat being lost to the ground.

A more simple and cost effective approach would be to eliminate draughts coming up through the floor by sealing cracks and holes; or by laying some form of sheet material or carpeting together with an underlay.

Typical savings: 3-5% of space heating energy

B) Space and water heating

There are many different types of heating/cooling systems and several types of fuel. Many systems in community buildings are old, inefficient or not controlled in the best way, which results in higher bills, higher carbon emissions and ineffective heating or cooling of the building. Take a look at the system in your building and find out what it comprises and how it is actually used.

New boiler/heating system

Your building's space and water heating may be provided by a central boiler or by stand-alone heaters, or a combination of both. You should seek expert advice on whether this heating arrangement is the optimum solution for your building. If the heating system is 10-15 years old or more it is likely to be relatively inefficient, especially in the case of a non-condensing boiler, and you may want to consider a replacement. Your water heating requirements will influence your choice of heating system i.e. will the boiler also provide hot water for basins or kitchen, or will these use stand-alone 'instantaneous' units?

If the main system uses an expensive heating fuel (oil, electricity or LPG) you may want to consider switching to mains gas or wood, although this can incur significant capital costs.*

Typical savings for a new condensing boiler: 15-20% of (boiler) heating energy

*NB renewable energy technologies such as wood-fired boilers are not eligible for WPD Community Chest funding (but will benefit from the national Feed-in Tariff or Renewable Heat Incentive).

New heating controls

Before thinking about the different types of controls that are available, you should decide who will be in charge of the heating system, as operating it properly is essential if it is to work effectively. Community buildings are often used intermittently, leading to difficulties in programming the heating to allow suitable warm-up times and prompt switching off. This can mean that the heating is often left on for much longer than needed. Advanced controls such as timers, programmers and zoning (individual control of more than one area) can lead to significant savings and more comfortable temperatures. Basic controls like thermostatic radiator valves (TRVs) and room thermostats should be regularly checked as building users may fiddle with them, changing them from their optimum settings.

The heating system and the control system need to be chosen together, as different forms of heating lend themselves to different forms of control.

Typical measures and savings:

- *Time controls on electric hot water tanks: 20-50% of water heating energy*
- *Presence detector controls on electrically heated rooms: 10-40% of space heating energy*
- *TRVs: 5-10% of space heating energy*
- *General upgrade of heating controls: 5-25% of total heating energy*

Point-of-use water heaters

The demand for hot water can vary greatly over the week in a community building and it makes little sense to heat a whole tank of water just to use a small amount. Some form of local instantaneous appliance, usually powered by electricity or gas, may therefore be the best option for water heating. This also avoids long pipe runs where a hot tap needs to be run for some time before hot water comes out.

Typical savings: 10-30% of water heating energy (where replacing centralised supply)

Insulation of hot water pipework

Hot water pipework which is uninsulated will result in heat being lost to the surroundings and where the pipe runs through unheated spaces, it will not usefully contribute to the heating of the building. Insulation of hot water pipes and valves can therefore be a simple, cost-effective measure.

Typical savings: 5-10% of space/water heating energy (depending on length of pipes)

C) Lighting

The majority of community centres are lit by fluorescent lights. These are relatively energy efficient but most can be upgraded to higher efficiency slim-line 'T5' tubes. Standard light bulbs should be replaced by low-energy 'compact fluorescent lamps' (CFLs) or LED bulbs. These give substantial energy savings, last 15 years or more and are now available in virtually all shapes and sizes.

Few community buildings have anything other than manual on/off switches for lighting control, meaning that lights are often left on unnecessarily for long periods. Timers and motion sensors can be an effective way of making significant savings, providing they are installed and set up correctly taking into account the room or area's occupancy patterns.

Typical measures and savings:

- *Replacement of T12 or T8 tubes with T5: 40-50% of lighting energy*
- *Replacement of tungsten filament bulbs with CFLs: 70-80% of lighting energy*
- *Automatic lighting controls: 20-50% of lighting energy*

D) Electrical appliances

Community buildings usually contain a range of appliances such as kettles or water boilers, fridges, microwave ovens and office equipment. Most new devices are now supplied with an energy efficiency rating, so by replacing old appliances with new ones (e.g. rated A++) substantial savings can be made. Simple programmable on/off timers can also be highly effective on a range of equipment including instantaneous water boilers, photocopiers and printers.

Typical measures and savings:

- *Time controls on office equipment: 20-60% of associated electricity use*
- *Replacement of an old fridge/freezer with an A++ unit: 50-80% of associated electricity use*

E) Water use

Reducing the quantity of water used in a building will not only save energy and carbon emissions in the supply and treatment processes of the water industry, but will also save energy by reducing the amount of water that needs to be heated in your hot water system. There are a number of simple, low cost measures that can be taken to reduce water use which will have minimal impact on the appliances' performance but will make notable savings in the long term.

Typical measures and savings:

- *Spray taps: 0.04 tonnes CO_2 per year (for a typical wash basin in use 6 days per week)*
- *Volume control in toilet cisterns: 0.01 tonnes CO_2 per year (based on 12 flushes per day, saving 2.5 litres per flush)*

Using the survey to put in an application for a grant

From your list of improvements in section 2, decide which will have the greatest impact on energy saving, and obtain quotes for these measures. (CSE's advice website www.cse.org.uk/loveyourhome is a good place to start for information on how much each improvement might save.) NB you should include no cost / behavioural measures in this list.

If you flag up a number of areas that need addressing you may want to prioritise actions, or identify options based on their cost, ease of implementation and effectiveness.

Finally, decide which improvements you will include in your application for the Community Chest grant and list the improvements and costs on the application form. Note: you will need to make sure that you have permission from any relevant individuals / bodies to go ahead with the measures you've proposed.

More information

To find out more about the measures outlined above, visit CSE's energy advice website: **www.cse.org.uk/loveyourhome**