



Energy Local

Energy efficiency project for Cyd Ynni-Ynni Lleol Bethesda

INTRODUCTION: SCOPE OF PROJECT

The purpose of the energy efficiency project was to offer individual advice to members of the Cyd Ynni-Ynni Lleol Bethesda scheme. This is a 'Local Energy Club' that was set up as a pilot scheme in Bethesda to test the Cyd Ynni / Energy Local concept for the first time. The idea is to connect households with community renewable energy generators through a common supplier and negotiate favourable prices for the users and good tariffs for the generator so that the community benefits in more than one way. Beginning around eight months after Cyd Ynni-Ynni Lleol Bethesda was set up, every member of the club (i.e. every household being part of the scheme) was offered to take part in the energy efficiency project, and home visits were arranged with all those that showed an interest. During these visits, the discussion focussed on energy saving issues, including different ways of insulating, heating systems and the everyday use of electricity and water.

The aim was to get an idea not only of what types of houses there are in the area and how much work has been done by individuals and landowners to reduce energy use in homes, but also of the energy awareness that residents in the area have. On the basis of this knowledge it is hoped that we can offer more help to the area's households in their efforts to reduce their energy use and their carbon footprint.

Hopefully this summary of how the project was co-ordinated and carried out as well as its results will be useful for similar community groups planning similar projects.

PART 1: ARRANGEMENTS AND CO-OPERATION

Energy efficiency advisers

Two energy efficiency advisers were employed to carry out the home visits. Both had followed the NEA's 'Energy awareness' training. One of the advisers came from the community itself and was a member of the scheme, whereas the other was from outside and worked for Severn Wye Energy Agency and Resource Efficient Wales. Maybe it is worth noting that it could be a little easier for the adviser from the community to get a positive response by members. It was easier to break the ice over the phone and in the homes, people are more comfortable letting someone they know into the house, and sometimes they even said: 'If it helps you, come over.'

Arrangement of visits

The target group of this project were households that were already members of the community energy scheme Cyd Ynni-Ynni Lleol Bethesda, or those that had shown interest in joining. The visits were arranged over the phone or by email, or both; some replied to the initial email, others needed a more personal phone call to remind them. On the whole members were happy to take part in the project, either because they were keen to learn more about energy issues in their homes or because they wanted to help the project and therefore help other people in the area. When people did not want to take part, the reason was mostly that they knew enough about energy saving and issues of sustainability and improving the energy efficiency of their houses, and did not feel the visit would be of any benefit to them.

Number of visits

The two energy efficiency advisers together visited 57 (34 and 23) homes out of 114 Cyd Ynni-Ynni Lleol members and 22 with an interest to join.

Number of homes that were contacted initially	136
Visits	57
Not wishing to have the visit	29
Unable to establish further contact or to arrange a visit	50

Hours of work needed for the project

Every visit took around two hours of work: between three quarters and an hour for the visit itself and another hour to fill in a spreadsheet provided by Resource Efficient Wales and to write an individual report to each household about the outcomes of the conversation.

Format of visits

Before starting the visits, the advisers created a sheet with questions to address during the visits (Appendix 1). Some of the questions only needed a tick, others were asking for information from the members. How much time every question needed depended on the knowledge of the member and on the type of home.

A template by Resource Efficient Wales /Severn Wye was also adapted for writing individual reports after the visit (Appendix 2), as well as a spreadsheet by the same organisation to record basic findings.

The visits consisted mainly of an informal conversation with the members. Some people were keen to show their boilers or walls or windows etc, at other times it was felt that they did not want to show anything in their homes. In such cases general advice was given verbally, and that was then reinforced in the individual report.

The external adviser knew more about technical details (e.g. different lamps), but it is difficult to say whether that made a lot of difference.

Co-operation during the visits

On the whole, members of the pilot were willing to reply to questions, discuss insulating methods and energy saving measures and get a view of their energy use. The odd one was very enthusiastic to discuss wider energy issues and possibilities too; others only keen to get it over and done with. This sometimes depended on the time of day and family and work related arrangements.

Cyd Ynni-Ynni Lleol is a kind of scheme where people are keen to contribute to their community and to be part of an environmental project. We therefore assume that the good co-operation and the positive reception we had depends largely on the close-knit community in the area.

PART 2: RESULTS

General results

Many homes have already made possible alterations to their houses, including double-glazed windows, loft insulation and central heating, and that because their houses are old and stand open to the weather where insulation is needed to stay warm.

Only 4 of the 57 rented their homes, three privately and one in social housing. The rest are all home owners.

One of the most striking results maybe was how much members already knew about the need to reduce energy loss and how keen they were to do something about it. Maybe the pilot scheme in its early stage has attracted people who

believe in the principles of the pilot and who are prepared and able to risk something new, and that this is why more really energy-aware people than assumed are part of the scheme. This does not mean, though, that there is no uncertainty or confusion about some issues.

In the old houses there are possibilities to insulate more and save much more energy, but these in many cases mean major work like insulating walls or floors, which costs a lot of money and also means major disruption to the household.

Also in old houses, people are concerned about the effect of insulating stone walls in terms of the ability of the walls to breathe and also the risk of trapping dampness. Guidance and expertise is needed to advise people, and maybe we need to find more sources of more natural insulating and building materials to avoid such problems.

Types of houses that are part of the scheme

Age of houses

Dyffryn Ogwen is a semi-rural area with many old buildings (before 1900) and a few more recent housing estates. The age of a house says a lot about how it was built, and this influences the possibilities to reduce energy loss. Of the 57 homes we visited, 34 (60%) were built before 1900, or almost three quarters (74%) before 1930. Only 4 of the homes (7%) were built in the last 27 years since 1990.

Age of building	Number	%
Before 1900	34	60
1900-1929	8	14
1930-1949	2	3.5
1950-1966	5	9
1967-1975	2	3.5
1983-1990	2	3.5
1991-1995	1	1.75
1996-2002	1	1.75
2003-2006	1	1.75
2007-2017	1	1.75

*(The sum of the percentages is a little over 100 because numbers are rounded)

Type of buildings

The majority of houses is built of stone. Brick walls are found in detached homes like bungalows or houses in housing estates. This has implications on how useful government schemes to help people with insulation are for the local population; such schemes are often only applicable to cavity brick walls.

Type of house	Stone	Cavity brick	Other
Detached 25	16	8	1 (timber frame)
Semi-detached 15	11	3	1 (stone / cavity)
End-terrace 8	7	1	
Mid-terrace 9 (one flat)	8	1	

Insulation

Walls

The fact that 42 of 57 houses are stone-built suggests that there is a big potential in the area to make a community effort on wall insulation, but knowledge, specialists and resources are needed for that. With government grants focussing on loft and cavity wall insulation, no large-scale initiative has been available to help local home-owners in this respect.

We found that the reason for not insulating was not indifference, but a number of valid concerns:

- Cost
- Stone appearance of house that people don't want to lose
- Limited space inside
- Lack of knowledge about sustainability of insulating materials (raw materials, production processes, longevity, ability to recycle, likelihood of fires)
- Concern about negative effects for instance on the breathability of houses, or other parts of the building (e.g. wooden beams) and damp
- Size of work

In a wet and mountainous area these concerns increase for those who live on hillsides with water running freely and those whose houses are built into the ground.

Considering these concerns, we tend to think that there is not enough knowledge available about more natural insulating materials and about how to address problems like damp or breathability as part of the insulating process.

Dampness

Talking to members about their walls, we also spoke about dampness and condensation, explaining how dampness is caused and simple ways to reduce condensation in the house. A number of people had installed some kind of

damp-proof course to stop damp entering the house from inside the walls (foil, polystyrene, special paint) but not always considering whether the dampness came from within or without. It was sometimes an answer to damp in one place without considering the whole building. Most members knew what condensation is and how to reduce it.

Windows

Only three of the homes were without double-glazed windows; this again shows people's awareness of the need to insulate against heat loss and draughts.

Roofs

Brick houses on the whole have more loft insulation than stone houses. Many of the old stone houses now have rooms in their roofs, either as storage, but more often as extra room. This reduces the options for insulation as the ceiling is often low.

Floors

Not many of the households have insulated their floors. 8 of them have insulated their floors, a number of them very old houses that had complete makeovers. Three more have insulated parts of their floors, e.g. in a newer extension. Several members wanted to know more about the possibilities to insulate their floors.

Insulating floors means great cost as well as the upheaval of the whole house as the old floor is dug up, so it is unsurprising that it does not appeal to many people. But 15% of heat is lost through floors, and it is worth considering the options to make them warmer.

Heating systems

Central heating was not part of the original old houses of course, but most of them now have central heating systems. Most of the systems heating rooms and water run on mains gas. A small number run on the Economy 7 system or on renewable energy. A large number of homes also have additional heating sources. Mostly these are wood burners or multifuel stoves that are used on very cold days or to make the house cosy. The same use is made of gas fires, oil radiators or fan heaters: they are only used occasionally.

Heating fuels

Most central heating systems are heated by mains gas, but in more remote places oil or gas from tanks or bottles is also used.

Heating system fuels	Number	%
Mains gas	34	60
Bottle/tank gas	8	14
Oil	6	11
Economy 7 electricity	3	5
Heat pump – air	1	2
Heat pump – ground	1	2
Wood	1	2
Infrared	1	2

Only one of the houses had not installed any kind of central heating and heated the house by wood fire only. And only a small number were a bit more adventurous and installed systems that heat their houses by more sustainable means.

Central heating

A central heating system is a system which heats the house through radiators and provides hot water too. 49 (86%) of the houses have a central heating system. Combi boilers – running the system and only heating water when it is needed – are now more widespread than those where hot water is kept in a tank – although that trend may be reversed as people combine more than one source of heat:

Boiler type	Condensing	Normal
Combi boiler (water on demand)	25	12
'Old' style (hot water tank)	4	4

29 of the boilers were less than 10 years old, and 18 older. This suggests that home owners are aware of technical improvements that make boilers more efficient and have taken steps to reduce the energy use of their boilers.

Normally central heating systems are supplied with programmers to set times and temperatures. 50 people said they had programmers. However, not everyone uses their programmer because work and family arrangements vary from day to day. They preferred to switch the heating on and off as it suits them, and they were not too worried about getting the house warm before getting up in the morning!

On the other hand, people did use the room thermostats (38) to set the temperature, and the radiator valves to regulate temperatures in individual rooms (50).

A small number of households (3) had a more complex combination of boilers behind range cookers or wood stoves and solar panels that heats water and central heating. The heat from all these sources is kept in a tank (thermal store), and water for the radiators as well as mains water is driven through this to be heated instantaneously. These are efficient systems that take advantage of solar energy, hydro and wood before they have to use any gas or oil.

Additional heat sources

It is striking how many people use heat from wood or coal in addition to their heating systems. Partly there is a feeling that a boost is needed on cold days, or that heat from a stove feels nicer in old houses. Some feel that burning wood is cheaper than gas – especially if they have their own trees.

Maybe there is a suggestion here that the houses are not warm enough and that more needs to be done to insulate the walls, or maybe that heat from stoves is more suitable for these houses.

Although wood is a more sustainable fuel than gas or oil, no one mentioned that it also causes CO₂ emissions. It would also be interesting to know whether anyone has a soot filter in their chimney.

Hot water

Whereas members showed a good awareness of their energy use in their heating systems and tried to keep their use low, this was not as true for their use of hot water. A number admitted that their water use was 'extravagant', and perhaps this is explained by the fact that most do not have their water metered. It was also felt that there is enough rain in the area and that we don't have to be saving it. Members were surprised when the point was raised that this water also has to be heated and that even clean water runs through the treatment systems which use energy.

Having said that, some people were concerned about their long pipes between their water tank or boiler and the tap, saying that water is wasted as the hot water takes so long to arrive at the tap.

Some were also surprised to hear that a hot water tank needs to be kept at 60°C to kill bacteria.

Electricity use

Most members were aware what in their houses uses a lot of electricity. They were given a leaflet with recommendations how to reduce energy use, and although that these are common knowledge some were grateful to be reminded.

Most people had low energy or LED bulbs in their lights, or they were aware that they were better but had not changed all of their bulbs. It was difficult sometimes whether to suggest changing now or recommend change as the old bulbs needed replacing was the best.

Renewable energy

A number of member households have put solar PV panels on their roofs, but we didn't go after how much this was saving them. One house had a ground source heat pump, another one an air source heat pump, no one had biomass, and one had an infrared heating system.

But many were glad of the opportunity to use hydro electricity!

Recycling

Most homes use the council's recycling services and know how to sort and separate their materials. We were asked whether it would be possible to know more about different types of plastic so that they only put the right types in their blue boxes.

We only talked about energy use in the home. There was no discussion about cars and flying, nor about production processes, resources or the shopping and waste reduction habits of members. Mentioning recycling only referred to reducing how much goes into landfill, not so much about avoiding to produce too much in the first place. This is another project.

Referring to other schemes

Three households were referred to the Nest scheme, and one other had already begun the process just before the visit.

PART 3: CONCLUSION

The first conclusion from this project is that most of the area's houses are old (not a surprise). This has meant that residents have undertaken as much

improvement work as has been possible, but it also means that there is a lot more to do to make these houses energy-efficient.

The second conclusion is that the members of the scheme are on the whole very aware of the energy they use to keep their homes warm. Maybe this is because of the type of houses they live in, perhaps because of the type of people the pilot project has attracted.

Following the project, it would be good to raise awareness further by giving advice and information about insulating old stone houses. We will conclude the project with an event on this subject.

The running the project was really quite smooth. But to know this better, we need to hear people's opinion about how useful the visits were. There was one comment that said it was patronising; this may have been the opinion of an individual. Some said that they had learnt something new.

APPENDIX 1

Energy saving check list

Name:

Address

House	
Type of building	
Age of building	
Listed?	
Tenure	
Number of bedrooms	
Type of walls	
	Insulated? How? When?
Type of roof	
	Insulated? How? Thicness? When?
Floor insulated?	
Type of windows (fframes/glazing)	
	Draughts?
Type of external walls	
	Draughts?
Draughts through chimney?	
draughts	pipes
	Letter box
	internal
	other

Heating	
Type of fuel	
boiler - type/model	
Age of boiler	
system	
happy?	
efficient?	
thermostats?	
programmer?	
TRVs?	

secondary heating - type? How often?	
Timing arrangements	

Hot water	
Is there a tank? Insulated?	
thermostat – what temperature?	
Water meter?	
How do you save water?	

Damp	
Type of damp	
What to do to stop condensation	

EPC - Score/grade/date	
------------------------	--

Appliances	
standby	
lighting	
cooking	
machines	
energy label	

Energy use	
Measuring gadget?	
recording kWh	
dashboard	
report	

Your Home Energy Report



Name:
Address:

DISCLAIMER: *While reasonable steps have been made to ensure that the information in this report is accurate and complete, Severn Wye cannot be held liable for any direct, indirect or consequential loss or damage that results from work undertaken on the basis of the recommendations. Nothing in this report is intended to be or should be interpreted as an endorsement of, or recommendation for, any supplier, service or product. Any person making use of this report does so at their own risk.*

Section 1 | Summary

During our visit to your home, we discussed the main issues that may affect your energy use in the home. We asked questions about your home and your habits, and general advice was given about the best ways to insulate the building, save water, and save electricity. This report summarises the information you gave us in a table and then notes the main points of advice. The report has the following sections:

The building itself, including walls, roofs and floors as well as the windows and the measures that have been taken to insulate the building to avoid heat loss. Remember: in an uninsulated building, 35% of heat loss occurs through the walls, 25% through the roof, 10% through windows and 15% through floors and from draughts. It is worth considering whether your home insulation could be improved to save energy and money.

Your heating and hot water system, which is important to keep you warm throughout the year. We spoke about the different thermostats in a heating system and mentioned the recommendations for water and heating temperatures. We also discussed how to ensure the most efficient use of your central heating system and possible ways to reduce your use of water.

Your energy use in the home. We discussed simple no-cost measures to save energy, and referred to a few devices available to help you reduce your use of electricity and water.

There was also an opportunity for you to raise any questions about Cyd Ynni-Ynni Lleol Ogwen.

GENERAL ADVICE

Regulating your heating and hot water system with the thermostats

The room thermostat, which regulates the general temperature of your dwelling, is usually set between 18 and 21°C, depending on how much you feel the cold and how active you are. 21°C is usual in living rooms, and for a bedroom a temperature of about 18°C is recommended.

Most heating systems have thermostatic radiator valves. These can be used to regulate the temperature of individual rooms. In unused rooms it is recommended to turn the valve to a low setting to provide low-level heat and avoid condensation problems in the room.

The boiler thermostat is recommended to be set at 60°C during the summer when you heat water only (no lower as this level is needed to kill any bacteria), and between 70 and 85°C in the winter when the central heating is on and water runs through the pipes and radiators as well.

If you are using a timer, remember the warming up and cooling down periods: wake up to a warm house but let the heating switch off before bedtime as the house keeps the heat. This will depend on the efficiency of your heating system and your insulation.

Energy performance labels

You were advised to take note of energy performance labels when you need to buy a new machine or equipment, and compare their use of electricity (kWh) and water (l) and their rating (D-A⁺⁺⁺).

Recycling and avoiding waste

You should be aware of the need to recycle waste too. This not only reduces the amount of waste in landfill sites but also helps to make better use of the resources required to produce equipment, food, clothes and any other materials. Give some thought to how you could use less petrol, buy fewer non-essential things, share, or re-use things for another purpose.

Section 2 | Your property

Information about the property...

Building type		Property type	
Property age		Number of bedrooms	
Wall Type		Wall insulation type	
Roof type		Roof/loft insulation type	
Floor type		Floor insulation type	
Glazing		Evidence of condensation	
Tenure		Years resident	
Number of occupants		Local authority	

Information about the heating...

Heating type		Fuel type	
Working?		Boiler type	
Boiler age		Boiler Efficiency (when new)	
Secondary Heating		Secondary heating fuel	
Hot water system		Hot water tank	

Section 3 | Advice and referrals

This section contains a brief summary of the advice, recommendations and referrals that we have made for your property.

Advice given to you...

