Report on Renewable Energy
Public Consultation held 7 October 2011
by the
Elham Environment Group, (EEG)

Executive Summary

On 7 October 2011 the Elham Environment Group (EEG) held a public meeting to explore renewable energy options for the home and in the community. The purpose of the event was to introduce the various renewable energy technologies and to stimulate a discussion to help identify the most appropriate and desirable energy solutions for our community.

Presentations on solar, wind, heat pump and biomass systems were given by EEG members and a representative from the Kent Downs Area of Outstanding Natural Beauty (AONB). This was followed by a question and answer (Q and A) session when the EEG team was joined by expert representatives from the Centre for Sustainable Energy (CSE) in Bristol and the local branch of the Council for the Protection of Rural England (CPRE Protect Kent), together with our local County Councillor who chaired the Q and A session. Subjects included the sustainability of government incentives, how to convert warm air into heating, solar photovoltaic (PV) schemes, the sustainability of wood fuel for biomass, and how to include the community in joint ventures. Wind turbines were the most debated issue of the session and the chair gave extra time for a lively discussion. There was wide agreement that the event was a useful initiative and that a renewable energy debate in Elham had well and truly begun!

A questionnaire on renewable energy was distributed in the village in August and another brief 'exit' survey was carried out at the end of the public meeting. Of the 12% of residents who responded to the August survey, 68% said they were considering renewable energy systems for their home and a similar percentage thought that community generation of heat or electricity using renewable sources would be good for Elham.

The exit survey was completed by 41 of the approximately 80 attendees at the meeting. 93% of respondents supported further investigation into a community solar power scheme, 74% were in favour of looking further into power generation by wind turbine. However 31% were opposed to any community wind scheme with 21% of these 'strongly' opposed.

Acknowledgments

Our sincere thanks to Rachel Coxcoon from CSE and Richard Knox-Johnston from CPRE Protect Kent for attending the meeting and providing expert responses to the questions raised, and to Susan Carey (Kent County Council) for her skilful chairing of the discussion. Matt Morris of Kent Downs AONB gave an authoritative presentation on biomass systems and has also provided a detailed analysis to EEG of a possible small-scale biomass heating project for community buildings. Josh Allen and Tom Vosper of Creative Environmental Networks (CEN) performed an initial environmental audit of Elham on behalf of the Energy Savings Trust (EST) and produced a report outlining some possible projects which were discussed at the meeting. Our thanks also to Jae Mather of the Carbon Free Group for his expertise and guidance in discussions with EEG, and to Alistair Gould, Tony Fielding and other members of the St Margaret's Energy Group for their advice and support.

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1 Introduction

This document summarises the background and outcomes of a public consultation on renewable energy held at the Village Hall in Elham, Kent in October 2011.

Elham is a village of approximately 620 households located in the Elham Valley between Canterbury (9 miles) and Folkestone (5 miles) in the North Downs Area of Outstanding Natural Beauty (AONB). A large part of the village centre is designated as a conservation area.

Elham Environment Group (EEG) was established in 2006 with the launch of the 'How Green is Our Valley' initiative, which questioned the sustainability of Elham across a wide range of eco topics. The fact that the village is not connected to the gas network, and is therefore reliant on oil, LPG and electricity for heating, has motivated the EEG to consider renewable energy alternatives at both the domestic and community scale. Other EEG campaigns and initiatives have included energy saving, insulation, thermal imaging of houses and carbon footprinting of the village, cost-effective delivery of heating oil through an 'oil club', and the provision of allotments.

The recent increases in fuel costs and the introduction of incentives for renewable energy in the form of the Feed-in-Tariff (FIT) and Renewable Heat Incentive (RHI) prompted EEG to investigate village-scale renewable energy. This investigation started in March 2011 when EEG commissioned a feasibility study by Creative Environmental Networks (CEN) on behalf of the Energy Saving Trust's Green Communities Expert Programme. The terms of reference for the study were to research mature renewable energy options for community application and for individual household use and to make recommendations for their use in Elham.

The study considered the following renewable energy options:

- Solar PV (electricity)
- Solar Thermal (heat)
- Wind Turbine (electricity)
- Ground Source Heat Pump (heat)
- Biomass (heat)
- Biomass (heat & electricity)

Useful data were obtained for household application of solar PV, solar thermal and ground source heat pumps. For community applications the study focussed on a medium-scale wind turbine as well as large- and smaller-scale biomass systems for the supply of heat only or for combined heat & electricity [(1)].

EEG decided to address all of these options in their public consultation with the exception of large-scale biomass. This was considered unsuitable for Elham because of the non-availability of a local site for a biomass plant, difficulty of access for wood chip or pellet delivery lorries, and the disruption which would be caused by laying of heat transmission pipes.

Implementation of any community renewable energy scheme requires a high level of local support. For this reason it was decided, before looking in more detail at any single option, to communicate our activities and to present the various renewable energy technologies at a village meeting.

Pre-Meeting Questionnaire

Introduction

To help prepare for the 7 October meeting a questionnaire was put together and delivered to every house in the village during a period of two weeks from 26 August. It comprised a single A4 sheet, printed on both sides, and entitled: '**Cut Fuel Costs and Carbon Emissions – Renewable Energy at Home and in the Community**'. The purpose of the questionnaire was to gather basic data on:

- Heating systems and fuel types currently used in Elham households
- The number of households already using renewable energy systems, and the types of system
- The number of households who had already considered investing in renewable energy systems, and the factors that might be deterring them
- Opinions on community renewable energy schemes.

The front page of the sheet gave the background to the questionnaire, together with brief descriptions of the main renewable energy technologies (Wind, Solar, Biomass, Heat Pump). The questionnaire itself was on the reverse of the sheet. The questionnaire leaflet is given in Appendix A.

Responses to the questions could be made either by circling the appropriate answers on the sheet itself, or using an on-line version of the questionnaire located on the 'Survey Monkey' website (www.surveymonkey.com). To encourage a good level of response a prize draw was offered, with two prizes of £25 vouchers, one valid for the Cosy Tea Rooms in Elham and one for Elham Valley Stores. Care was taken to make sure that those who responded on-line were also included in the draw. In total 622 questionnaires were distributed. The number of responses was 67, of which 45 were paper copies and 22 on-line responses. This gave a response rate of approximately 11%.

The questionnaire responses were analysed in a spreadsheet using a coding system to make the data more concise and easily manageable, and to facilitate creation of charts summarising the responses. A copy of the spreadsheet can be found on the EEG web site (http://elhamenvironment.co.uk). The questionnaire included space for comments and contact details. The contact details have been removed from the version on the website, and other comments have been edited where appropriate to maintain the anonymity of the respondent.

Questionnaire Results

The responses are summarized in pie charts in Figures 1 to 4. The numbers superimposed on the pie charts show the number of respondents giving a particular answer (not the percentage of respondents).

The responses to Questions 1 and 2 on the main fuels currently used for heating showed that more than 75% of respondents used oil as their main heating fuel, followed by electricity (12%), calor gas (7%) and wood (4%). Of those people using more than one fuel for heating, 40% also used wood, 12% also used electricity, and 37% used a combination of more than two types of fuel.

Questions 3 and 4 asked about existing renewable energy installations. Only nine respondents (14%) already had a renewable energy system in use. Of these, four were solar thermal systems, three were solar PV, one was a wood-fired boiler, and one respondent had a combination of systems. All nine respondents answered Question 5 saying they were happy to share their experience with EEG.

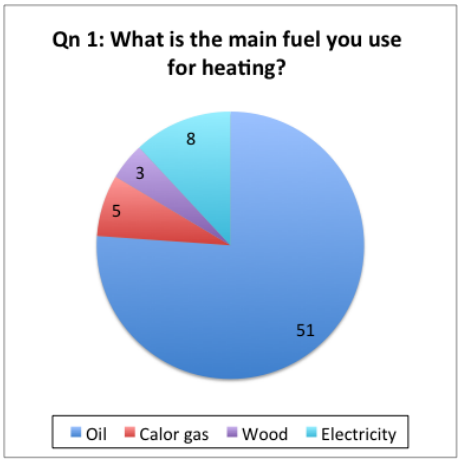
In answer to Question 6, 68% of respondents had considered moving to a renewable energy system in their own home. Question 7 asked what factors might deter them from implementing this; the high installation cost and long payback period were quoted by 67% and 55% of respondents respectively. Lack of technical (22%) and financial (15%) information were also important factors.

In response to Question 8, 70% of respondents thought that community generation of heat or power using renewable resources would be a positive move for Elham.

In answer to Questions 9 and 10, 44 respondents (67%) expressed an interest in coming to the 7 October public meeting, and 19 respondents (30%) said they would be interested in taking an active role in community discussions on renewable energy.

A number of respondents gave specific comments. The main topics raised were:

- Problems putting solar PV panels on older or listed houses – seven comments
- Living in leasehold housing – two comments
- Objection to wind turbines – two comments
- Renewable energy system capital outlay too high or payback too long – two comments
- Better spend money on nuclear power stations – one comment



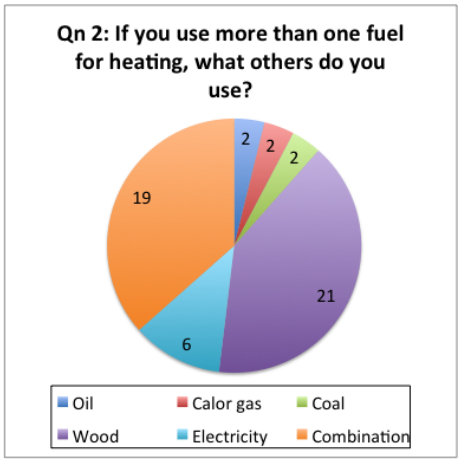
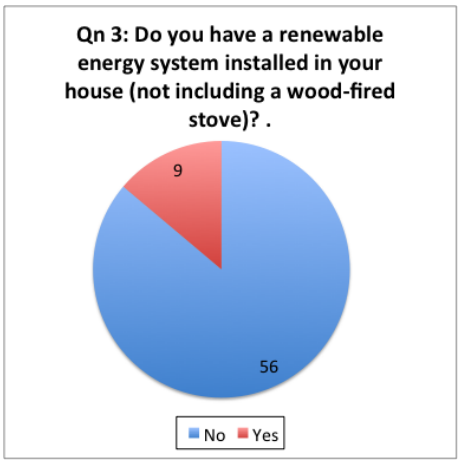


Figure 1. Responses to questions on existing heating systems



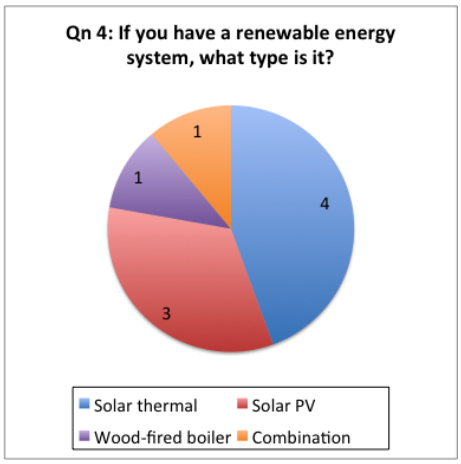
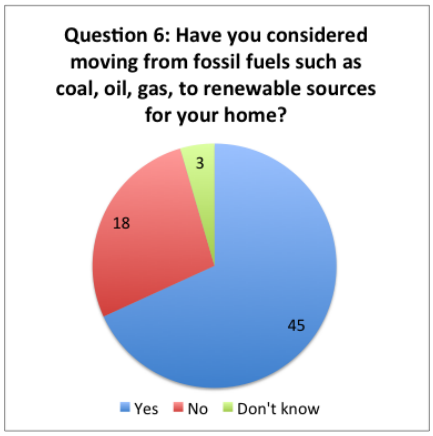


Figure 2. Responses to questions on existing renewable energy system



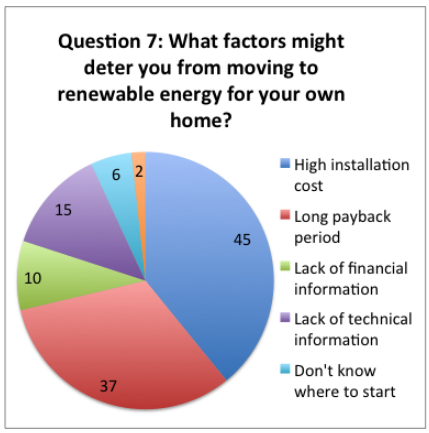


Figure 3. Responses to questions on installing renewable energy systems

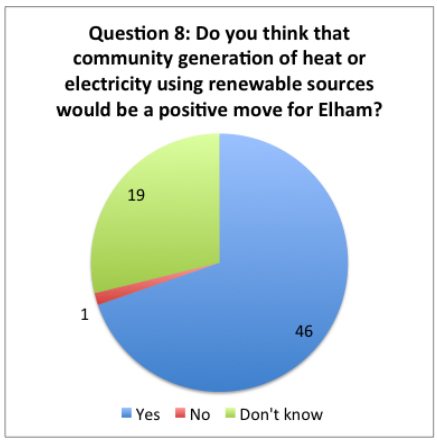


Figure 4. Responses to question on community generation of heat or electricity

Programme of meeting

Copies of most of the presentations can be found on the EEG website.

a) Introduction (Chris Jelly & Briony Williamson)

b) The Feed-in-Tariff, Renewable Heat Incentive & Green Deal (Paul Bright)

c) Brief description of the renewable energy options for Elham

- Solar PV & Solar Thermal (Scott Jagger)
- Wind Turbine (Chris Jelly)
- Heat Pumps (Paul Bright)
- Biomass systems (Matthew Morris)
- Sustainable Woodland Management (Matthew Morris)

d) Case Studies (DVDs from the CSE 'Plan LoCal' Resource Pack [2])
This was omitted owing to time constraints

e) Questions & Answers

Question & Answer Overview

The panel, chaired by Susan Carey, consisted of the following:

Rachel Coxcoon (CSE), Richard Knox-Johnston (CPRE Protect Kent), Matthew Morris (Kent Downs AONB), together with the EEG members who had made presentations.

Question one – posed by Jean and answered by Rachel Coxcoon

Q. Please could the panel tell me about the free solar panels that companies offer to put on our roofs? Can it be true that they are free and that I can get free electricity from it. What does it mean to rent our roof? Also I am told that solar panels are heavy, would these cause problems to the roof infrastructure?

A. The rent-a-roof scheme is related to the Feed-in Tariff scheme but the company gets the 43p per Kw hour. The panels are usually bought in bulk by the company and then placed on your roof free of charge to you. Because the panels are provided free, the Feed-in-Tariff is returned to the supplier who gains the attractive financial benefits in the long term.

You will only have free electricity if you use it whilst the sun is shining or on bright days. If you are home most days and use your appliances prudently then it is true that you will get a good source of free electricity.

You should ask the company if they have completed a survey of the roof to check that the infrastructure is sound enough for the weight of the panels. Make sure you obtain a copy of the survey.

Check the credentials of the company and make sure they are accredited Microgeneration Certification Scheme (MCS) suppliers.

It is best to buy your own solar PV installation, if possible. Communities can set up their own bulk buying schemes which would reduce the cost of the panels. Note: EEG has already trialled this with a local supplier with some success.

In response to a further question related to the ongoing efficiency of solar panels, Rachel explained that the life span is 25 years but that the efficiency does reduce by 10% over the first 10 years. The panels will, however, continue to perform their task for longer than 25years.

Question two – posed by Bryan and answered by Rachel Coxcoon

Q. What are the average installation costs of PV solar panels? Can we buy a solar system that will heat water as well?

A. The main costs are the panels. The reducing Feed-in-Tariff structure reflects the fact that panels are expected to reduce in cost over time. Currently the cost is approximately £3,000 per kW. The maximum domestic installation you can have to reap the best FIT payment is 4Kw.

PV-T panels will provide hot water as well as electricity but these are significantly more expensive.

Reference for all the above can be found in a publication 'Keeping the Lights on: Kent's Future Generation' [3].

Question three – posed by Adrian and answered by various members of the panel

Q. In such depressed financial times how can the FIT strategy be guaranteed or sustained? What if the country "goes bust"!!?

A. This is, of course, not something we can sit here and guarantee! However at the moment the tariff is enshrined within the law. It could be withdrawn for new investors or reduced considerably in the future.

However, the cost of fossil fuels is rising all the time and these fuels are causing environmental damage. One has to consider what are more important, environmental issues or economic issues in relation to cost?

Chris reminded the audience that Elham may obtain £100,000 for PV Solar Panels from the current Energyshare bid and that we need more support.

Question four – posed by Sally and answered by Rachel and Richard

Q. Sally stated that she had undertaken a straw poll of 10% of adults in the village in which 73% were against wind turbines, only 7% in favour and 20% undecided. She then asked: "With millions in fuel poverty why should we be wasting money on such an inefficient system as wind turbines which are only 25% efficient?"

A. In reply Rachel agreed that many are in fuel poverty and that this will increase, which is why communities such as ours should take much more responsibility for reducing our carbon footprint and invest in individual and community alternative energy systems.

Rachel added that there are many myths and misunderstandings about wind turbines. The figure of 25-30% efficiency is often quoted but this is in fact the load factor. The load factor or capacity factor is the average power output i.e. actual output measured over a period of time, usually hours, divided by what could have been produced had the generator run continuously at peak capacity over the same period. The load factor should not be confused with the efficiency. Multiple wind turbines in the form of wind farms actually generate electricity around 80-85% of the time and power is converted into electricity very efficiently with none of the thermal waste inherent in fossil fuel plants. Wind power is in fact an efficient way to generate electricity using a free and renewable energy source [4].

Richard supported the notion that wind turbines can spoil the landscape and said that CPRE are dedicated to reducing the impact in areas of outstanding natural beauty.

Chris urged that the use of wind turbines should not be dismissed. With strategic and careful planning to minimise visual impact the benefits are huge for a small community such as ours. The "payback" is generous and could lead to energy saving investment in our community.

Question five – posed by Henry and answered by various members

Q. Henry asked the panel if it would be possible to harness the heat from the sun in his covered swimming pool area to heat the water. Colin asked if his large underwater tank could similarly be used for heating water for domestic use.

A. The panel agreed that the first scenario could be achieved through an air source heat pump. The second could be achieved through the use of a water source heat pump. They advised that advice should be sought from a reputable alternative energy company.

Question six – posed by Pat and answered by Matthew

Q. Pat was concerned that as we are in an area of outstanding beauty should we not be mindful of the scars on roofs of period houses as well as the scars on the landscape from wind turbines. Would biomass therefore be best for a village such as ours?

A. Matthew agreed that we needed to be mindful of the visual effects of employing methods of providing alternative energy. There are slate type solar tiles which can be used on old houses and wind turbines can be sited carefully and out of sight. However biomass may be better suited to a village such as ours although the infrastructure needed is quite large together with the requirement for regular bulk fuel supplies.

Rachel stated that there is some good guidance on best practice on ancient houses. This can be found on the Centre for Sustainable Energy website under 'Warmer Bath'.

The planning regulations relating to Solar panels exempt houses unless they are listed or in a conservation area. In the latter cases it is a legal requirement that planning permission be sought.

Question seven – posed by John and answered by Chris

Q. John asked the panel to explain the workings of the EEG and whether they are being funded by the taxpayer.

A. Chris explained our origins, our work so far and our plans for the future. He reiterated the work we have done and continue to do to involve the community. He outlined the current projects which encourage individual household systems but also focus on creating community systems acceptable to Elham residents. The concept of community schemes was reinforced by Andy Malloy as he described a project being carried out in Hampshire. This has been successful and is along the same lines as planned here in Elham as led by EEG. This is a good example of community led action. Mrs Malloy made a plea that Elham should think collectively and consider forming co-operative ownership of alternative energy systems, creating employment and mutual benefits.

Question eight – posed by several people

Q. Several people questionned the effect large scale use of biomass would have on the sustainability of wood from our woods and forests.

A. Matthew explained that coppicing woodland was a sustainable activity since trees, on average, would regrow within 15-20 years. Some trees such as hazel will grow within 7 years.

Coppicing is an essential process for managing woods for sustainability and in Kent this process has been neglected in much of our woodland. Similarly, trees need thinning on a rota basis and this process will provide wood for biomass systems.

Much of our waste wood is exported and this trend could be reversed for a much more efficient use as fuel for biomass systems.

The Forestry Commission monitors the management and coppicing of woodland and offers advice and in some cases grants. It was felt that biomass was sustainable although there are critics who would not agree. CPRE, for example, is concerned that the supply of wood is not infinite and has concerns about how this will be monitored.

Exit Questionnaire

Introduction

All those attending the meeting on 7 October 2011 were invited to complete an 'Exit Questionnaire', which made the following statement: *'I would be happy for Elham Environment Group to look into the possibilities of a community heat or energy scheme using the following technologies*'. There were three technologies listed, namely: *Solar (thermal or PV)*, *Wind (turbine)* and *Biomass (boiler or generator)*. For each of these technologies there were five options in response to the statement: *Strongly Agree, Agree, No Opinion, Disagree, Strongly Disagree*, of which one only should be checked for each technology. A copy of the Exit Questionnaire is given in Appendix B.

Results

The responses were analysed in the same way as those for the August questionnaire. The spreadsheet of results is available on the EEG website. The results are summarized in Figure 5. Again, the numbers superimposed on the pie charts show the number of respondents giving a particular answer (not the percentage of respondents).

Forty-four people who attended the meeting completed the exit questionnaire. There was strong support for community use of solar energy, with 93% agreeing or strongly supporting further investigation of this technology. Opinion on wind power was more divided: 64% were in favour of looking further into the wind option, while 34% opposed this, with many being strongly opposed. Regarding biomass possibilities, 70% were in favour of further investigation, with 14% opposed.
A number of people wrote comments on the back of the questionnaire, and these can be seen in the analysis of results on the EEG website. Three qualified their support for wind power by supporting only a single turbine, or maybe two, and depending on

location. Two had concerns about biomass systems, with one supporting such a system only if a very good economic case could be made, and another expressing concern about imported pellets and control of wood cutting.

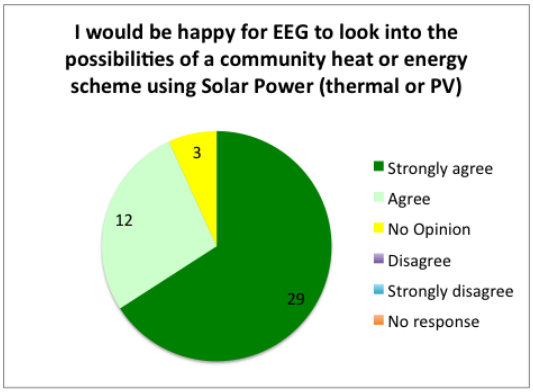


Figure 5a. Responses to 'exit' question on Solar Power for community schemes

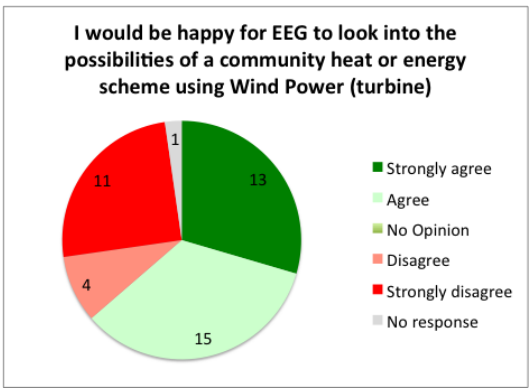


Figure 5b. Responses to 'exit' question on Wind Power for community schemes

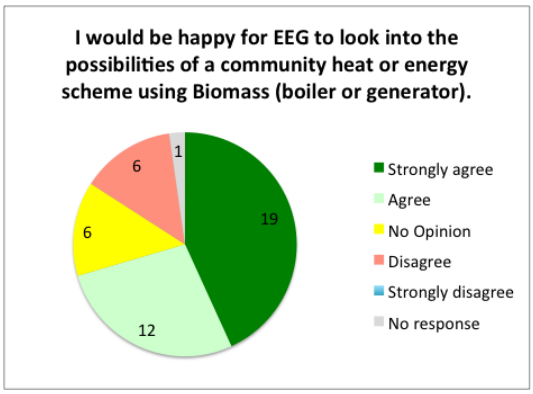


Figure 5c. Responses to 'exit' question on Biomass for community schemes

Future Actions

Future actions and activities will be considered by EEG and communicated via our website, the Elham newsletter, and further public meetings where appropriate. We are currently discussing the following actions:

- In view of the strong support shown in the exit questionnaire for community use of solar energy, we will continue to look for sources of funding for community solar schemes such as putting solar PV panels on community buildings. We will also consider how best we can support people who are interested in installing domestic solar panels. This could include, for example, providing access to expert information, providing feedback on experience with the various suppliers, advising on the industry quality assurance and installer approval schemes, or putting interested persons in touch with others to possibly bring costs down through 'bulk buying'.
- Further detailed study of the small-scale biomass scheme suggested by CEN and outlined at the meeting by Matthew Morris, which could provide heating to the primary school, Anglican Church and church hall, and possibly other nearby buildings.
- Although the exit questionnaire showed a majority in favour of a community wind scheme, there was also strong opposition. We will look in more detail at what this could involve – possible sites, size of turbine, costs and financial return to the village, with a view to communicating this at a future meeting. This would allow discussion based on factual understanding of the pros and cons of such a scheme.
- The primary school is keen to develop some 'Ecology' based student projects. We are in discussion with the staff and will be developing ideas during this year.

Bibliography / Useful literature

- *Sustainable Energy Without the Hot Air*, David J C MacKay, UIT Cambridge, 2009 (also available to download free at http://www.withouthotair.com/download.html)

References

(1) *A Community Renewable Energy Feasibility Study in Elham Village, Kent*, Energy Saving Trust, March 2011

(2) CSE Plan LoCal DVDs and Resource Pack, Centre for Sustainable Energy, www.planlocal.org.uk

(3) *Keeping the Lights On; Kent's Future Generation*, Published by CPRE Protect Kent, August 2010, http://www.cprekent.org.uk/index.php/news/128-keeping-the-lights-on

(4) *Common Concerns About Wind Power*, Centre for Sustainable Energy, May 2011, http://www.cse.org.uk/downloads/file/common_concerns_about_wind_power.pdf

Appendix A: Pre-Meeting Questionnaire

Elham Going Green

CUT FUEL COSTS AND CARBON EMISSIONS

RENEWABLE ENERGY – AT HOME AND IN THE COMMUNITY

The Elham Environment Group is interested in your views on the use of renewable energy, either in your own home or for the benefit of the whole village. We have all seen large increases in the cost of oil, petrol/diesel and electricity. The government has ambitious targets to increase the use of renewable energy, and financial incentives are available. Renewable energy can:

- Save money compared with current energy systems
- Provide cash payments for every unit used, through government tariffs which support some renewable energy schemes
- Be a source of electricity and/or heat for the whole village
- Reduce our 'carbon footprint' and use of scarce fossil fuels.

On the back of this sheet is a questionnaire. We would be grateful if you would complete this, to help us gauge the interest and expertise in the Elham community. The summary below explains what we mean by 'renewable energy', and what systems and technologies are available.

What is Renewable Energy?
Renewable energy is energy which comes from natural resources such as sunlight, wind, rain and tides, which are naturally replenished. It also includes the use of 'biomass' as a fuel (biomass refers to wood products which come from a renewable source). Common renewable energy systems include:

- Wind power – generation of electricity by a wind turbine, the size of which depends on the desired electricity output
- Solar thermal – heating of water by solar panels
- Solar photovoltaic (PV) – generation of electricity by solar panels (some modern systems combine thermal and PV in one panel installation)
- Biomass thermal – using a wood-chip or wood-pellet fuelled boiler to provide heating and hot water
- Heat pump – using a highly efficient 'reverse-refrigerator' to take heat from the outside air (air-source heat pump) or from the ground (ground-source heat pump) to provide heating.

Where is Renewable Energy Used?
Renewable energy systems can be used by individuals in their own home. Larger systems can also be established in a community (for example an array of solar panels in a field, a wind turbine, a biomass-fuelled boiler) to generate electricity and/or heat for schools, public buildings and local households who want to participate. All energy systems have both positive and negative aspects, especially in a designated Area of Outstanding Natural Beauty. We will make use of the results of the questionnaire in organising a village meeting (Friday Oct. 7th in the Village Hall), open to everyone who has an interest, to discuss possible options for individual and community use of renewable energy, including the plusses and the minuses. At the same time we will identify organisations and individuals who can provide expert and up-to-date advice on the various systems. We have no hidden agenda or preferred outcome, but we do have some expertise, and access to people with a lot more expertise. Your response to the questionnaire, and participation in a village meeting, will help us set a future direction in line with the wishes of the Elham community.

Thank you for your interest and assistance.

Elham Environment Group (www.elhamenvironment.co.uk)

Please **draw a circle** around your preferred answer, or write in the blank box. Circle more than one answer where appropriate.

1. What is the main fuel you use for heating?	Oil	Calor Gas	Coal	Wood	Elec.	
2. If you use more than one fuel for heating, what other(s) do you use?	Oil	Calor Gas	Coal	Wood	Elec.	
3. Do you have a renewable energy system installed in your house (not including a wood-fired stove)? [If No, go to 6.]	Yes	No				
4. If you have a renewable energy system, what type is it?	Solar Thermal	Solar PV	Air-Source Heat Pump	Wood-Fired Boiler	Wind Turbine	
5. If you have a renewable energy system, are you willing to discuss your overall experience with us?	Yes	No				
6. Have you considered moving from fossil fuels such as coal, oil, gas, to renewable sources of energy for your own home?	Yes	No	Don't Know			
7. What factors might deter you from moving to renewable energy for your own home?	High installation cost	Long payback period	Lack of financial information	Lack of technical information	Don't know where to start	Not thought about it
8. Do you think that community generation of heat or electricity using renewable sources would be a positive move for Elham?	Yes	No	Don't know			
9. There will be a meeting in the Village Hall on Oct 7th to discuss the current energy situation and the renewable alternatives to fossil-fuels. Are you interested to come along?	Yes	No	Don't know			
10. Are you interested in taking an active role in community discussions on renewable energy in Elham?	Yes	No	Don't know			
11. Please add any comments here.						

To be entered into the prize draw please give your contact details:

Name: …… Address: ……

Phone: …… Email: ……..

Elham Going Green

If you have any other comments or questions please email info@elhamenvironment.co.uk or write on a separate sheet and attach to this questionnaire.

Appendix B: Exit Questionnaire

Public Meeting on Renewable Energy, Elham, Oct 7th 2011

"*I would be happy for Elham Environment Group to look into the possibilities of a community heat or energy scheme using the following technologies*"

Please indicate your level of agreement or disagreement with this statement by putting a cross in ONE box for each of the technologies listed.

	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
SOLAR (THERMAL or PV)	☐	☐	☐	☐	☐
WIND (TURBINE)	☐	☐	☐	☐	☐
BIOMASS (BOILER or GENERATOR)	☐	☐	☐	☐	☐