

CHOLSEY RENEWABLE ENERGY EVENT

PUBLIC MEETING 9TH MARCH 2012
Cholsey Primary School



TV Energy

FOREWORD

This community meeting was organised by TV Energy on behalf of Sue Roberts, Sustainable Wallingford and Sustainable Cholsey. TV Energy would like to thank members of sustainable Cholsey and in particular Mary Miller, Mike Blanch, Adam Twine and Bryan Regan for presenting at the meeting.

Dr Keith M Richards OBE
Managing Director TV Energy

15th March 2012

Report reference: TVR256

SUMMARY

TV Energy organised and facilitated a public meeting on behalf of Sustainable Cholsey at Cholsey Primary School on the 9th March 2012. The meeting targeted an audience of around 28 and included a mix of delegates from Cholsey and the surrounding villages. Presentations were given by TV Energy, BVG associates and the land owner of Westmill wind farm co-operative. The presentations gave an overview of the renewable energy types and uses, community co-operatives, technical information on wind turbines and a case study on a community wind project nearby.

CONFERENCE PROGRAMME

TV Energy



Cholsey Renewable Energy Event

Friday 9th March 2012

Cholsey Primary school

EVENT PROGRAMME

19:30 Doors Open		
19:45-19:55	Welcome and introduction	Mary Miller Local resident
19:55-20:05	Renewable Energy overview & small community renewables	Keith Richards and Emily Tomalin TV Energy
20:05-20:15	Technical information on wind turbines	Mike Blanch BVG Associates
20:15-20:25	Example of setting up and running wind and solar co-operatives with a local case study	Adam Twine Land owner of Westmill wind farm co-operative
20:25-20:35	Summary	Bryan Regan Local Resident
20:35-21:15	Question and answer session/ discussion	
21:15-21:45	Snacks, wine and soft drinks	

PRESENTATIONS AND DISCUSSION

The meeting gave members of the public the opportunity to examine the possibility of a community wind turbine sited on a hill close to Cholsey. There were 6 main speakers at the meeting who covered different aspects of Renewable Energy, community co-operatives and wind turbines. The main points from each presentation are set out below.

Mary Miller-Local resident

The public meeting was held to give members of local communities the chance to learn about what community Renewable energy is all about, what community co-operatives are and ultimately- does Cholsey want a wind turbine? It was noted that the first sustainable Cholsey meeting was 18 months ago and since then wind data has been and continues to be, collected. Over time, progress has been made but there is still a long way to go before anything significant happens within Cholsey. Sustainable Cholsey has recently been given a boost by the Local Energy Assessment fund (LEAF) win with half of the funding obtained helping 10% of the houses in Wallingford to improve their energy efficiency. The other half of the fund will be put towards the potential use of Renewable Energy such as a community project or projects. Finally, the meeting at Cholsey school was funded by the grant received.

Keith Richards-TV Energy

TV Energy is a not for profit organisation located in the Thames Valley and works with a range of public and private sector partners including local authorities, housing associations, private sector businesses through to large estates and farms and provides independent technical and commercial support on all aspects of Renewable Energy and sustainability.

There are a number of Renewable Energy technologies that can be used for producing electricity, heat and cooling. Many technologies work well for small as well as large applications and often two or more technologies might be deployed to give the most sustainable and cost effective solution. There are currently various financial incentives from the government including the Renewable Heat Incentive (RHI), the Feed in Tariff (FIT) and the Green Deal to help encourage people to make the change from unsustainable to more sustainable energy generation and use. With increasing energy prices, making the change to renewables becomes ever more sensible financially. Perhaps the greatest challenge is to 'mainstream' renewables gaining wider adoption within communities. Helping those in fuel poverty is an increasingly important part of any community action.

The three most important renewable resources in the Thames Valley are wind, wood and waste. Solar is also significant and other technologies/ resources such as heat pumps and low head hydro can make contributions but will never match the potential of the '3Ws'. Hence, wind energy needs to be given serious consideration at any site.

Wind turbines come in many sizes and can be horizontal or vertical axis. Understanding what is best for a given site involves understanding the wind energy regime at different heights (wind strength and direction), the landscape and character of the area and impact on other activities. Technically, a large turbine or turbines may be the best solution but a local community may wish to develop a proposal that is smaller in scale but still offers many advantages. For example, some schools around the Thames Valley have installed small wind turbines on their grounds which produces up to a third of the electricity consumed on site.

Given the significant impact of changes that will be necessary to embrace renewable energy in communities, it is essential that options are debated and best solutions adopted. Drivers for change include factors such as saving money, making money, energy security, being able to reduce a community's 'carbon footprint', protecting the environment, improving local quality of life, improving and increasing educational opportunities and retaining or creating jobs within a community.

ESCos (Energy Service Companies) are becoming more common as a way to manage a portfolio of energy initiatives within a community. By way of example, TV Energy own and operate an ESCo supplying heat to a school in West Berkshire. Similar schemes are starting to multiply across England under various business models allowing local residents to have a stake in the operations and to influence their day to day decisions. Co-operative ventures are one particular route to gaining community buy-in.

Emily Tomalin- TV Energy

A Co-operative is owned and run jointly by its members, who share the profits and benefits. Some 30 Renewable Energy co-operatives have been set up since 2008. Of these, there are large and small scale co-operative schemes ranging from Megawatt (MW) to Gigawatt (GW) capacities.

Community co-operatives have many advantages and the shares in co-operatives earn a dividend and this is realised in the form of reducing energy bills. In addition, if a wind turbine or solar PV panels are connected through a private wire, for example, to a school, the electricity is valued at the price of production plus a premium gained under the 'FIT' regime. A further

advantage of a community co-operative is that if communities own their own networks, they can also sell the renewable electricity to neighbouring houses or community buildings.

Maid-Energy is one such co-operative and has been established to support sustainable development in Maidenhead and the surrounding area, for the benefit of local communities. At present Maid energy is involved with a new hydroelectric scheme on the river Thames.

Mike Blanch-BVG associates

Wind turbines vary in size, price, how they generate electricity and the method of power control. Wind turbines are also a great way of creating skilled jobs as each turbine is made of a number of components from the tower, motor and blades that requires expert development. There is a wide spread of wind speeds across the UK which vary depending on height and location.

Checklists are essential when looking at installing wind turbines as a number of issues need to be covered. The feasibility of a turbine needs to be considered as well as common concerns of a wind turbine. Noise from a wind turbine is one of the topics that needs to be looked at carefully- although this is rarely an issue if houses are a reasonable distance away (as would be the case at Cholsey Hill). Impact on the landscape is potentially the major impact and by the very nature of wind turbines they are highly visible. Proximity to military establishments (MOD) and certain telecommunications are also real issues and these need very careful consideration before further planning can take place.

The stages of a wind turbine development are important to take into account when planning a project and can take about a year to complete.

Adam Twine-Westmill Wind Farm

There are different ownership models when thinking of participating in a community project. Westmill Wind Farm first started in 1993 with the aim of developing a community owned co-operative and was inspired by a Danish model, which has over 100,000 owners. The project took 10 years for planning to be granted and had 3 permissions in total. Work started on the project in August 2007 and was commissioned in March 2008. Westmill Wind Farm comprises of 5 x 1.3 MW Siemens wind turbines which cost around £8 million to build. Each turbine is 50m in height to the hub with the blades reaching 31m in length. The output of the turbines is approximately 12 GWhr/year which is equivalent to annual domestic electricity requirements of 2,200 houses. The Westmill co-op was first registered in 2004 and has some 2,400 members.

The wind farm attracts lots of visitors every year, and has excellent educational aspects which make it perfect for school trips.

In addition to the community wind project, there is a 5MW solar farm co-operative on an adjacent site that cost approximately £12million to build. The co-operative was registered in May 2011 and construction of the solar farm was finished in July 2011.

Question and answer session

After the presentations there was time for the attendees to ask all the speakers questions and air their opinions on the topics covered in the meeting. There were a range of questions with the main question being: "Why a wind turbine on Cholsey Hill?" Bryan Regan answered and stated: "Cholsey Hill has very good wind speeds and we know this from the data we have been collecting. It is also a good site for a wind turbine because it is a good distance away from houses. In the future we will need power and the demand for electricity is increasing; coal and oil are finite resources and will eventually run out. Wind on the other hand supplies power when we need it most, on cold winter days when the wind is blowing. It has also been noted that electricity is lost through transport via the grid so why not produce it locally and use it locally?"

Another question asked concerned insurance, maintenance and decommissioning costs of wind turbines. Adam Twine and Mike Blanch shared the answer and confirmed that "there is insurance for wind turbines and you insure against replacement parts for example if the motor stops working or one the blades get damaged. In terms of maintenance they do need periodic mechanical checks which are usually done by the installer. In relation to decommissioning, Westmill wind farm for example, has planning permission for 25 years and we have put away a bond to cover the cost of decommissioning when the planning permission runs out".

One member of the public was concerned with the solar farm which is also established at Westmill and questioned "don't the panels take up valuable land for growing crops?" Adam twine offered the answer of "It's the question of food vs. energy. Westmill has chosen to start a solar farm co-op to help the local community. Farmers also get rent for the land they use to put the PV panels on. Going back onto wind turbines, we mustn't forget that wind turbines are not a permanent feature and are not changing the landscape forever. They will eventually be taken down"

Community involvement also stimulated some questions “are there any restrictions on who can take a share of the community project?” Again, Adam Twine and Mike Blanch shared the answer “No, not really. However, at Westmill wind farm no individual or company can buy shares worth more than £20,000 and £250 is the lowest share you can purchase. Whatever the level of investment, the owner gets one vote ensuring that larger organisations cannot dominate. The only exception is for other co-ops where higher levels of share ownership are possible. There are also different schemes to choose from when thinking of investing in a community project”

A further question which was raised was “why are we transporting wind turbines from overseas instead and buying them from UK?” the answer, offered by Adam Twine was “There is not the market for wind turbines in this country and thus there are few manufacturers. Places like Denmark build better quality wind turbines and have a high demand for them”.

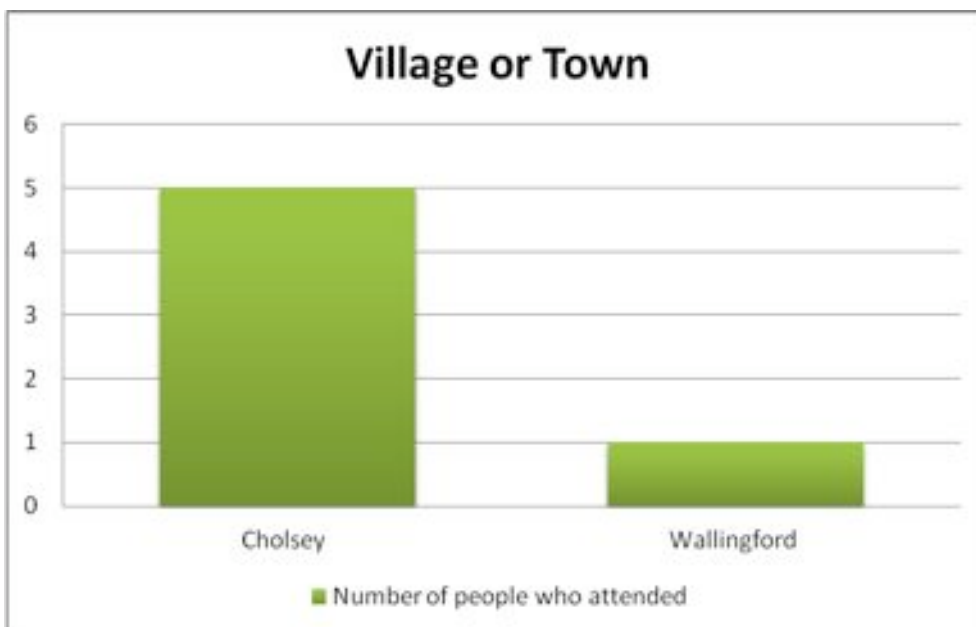
One member of the audience asked that the project should not be taken further until opinions had been sought from the MOD (concerning the proximity of RAF Benson) and the AONB concerning wind turbines on Cholsey Hill.

The final question of the night was “are there other opportunities other than wind, like Short Rotation Coppice (SRC) perhaps?” Keith Richards answered this “Yes, SRC offers excellent local opportunities for farmers and growers. The wood that is grown on typically a three year rotation, can be chipped and used to fuel boilers producing heat and potentially power. . TV Energy has a growers group (TV Bioenergy Coppice Ltd) that has some 200 hectares of coppice across the Thames Valley”

In addition to individual questions, discussions between members of the public also included that of energy prices and common concerns about wind turbines, i.e. noise, cost and visual impact.

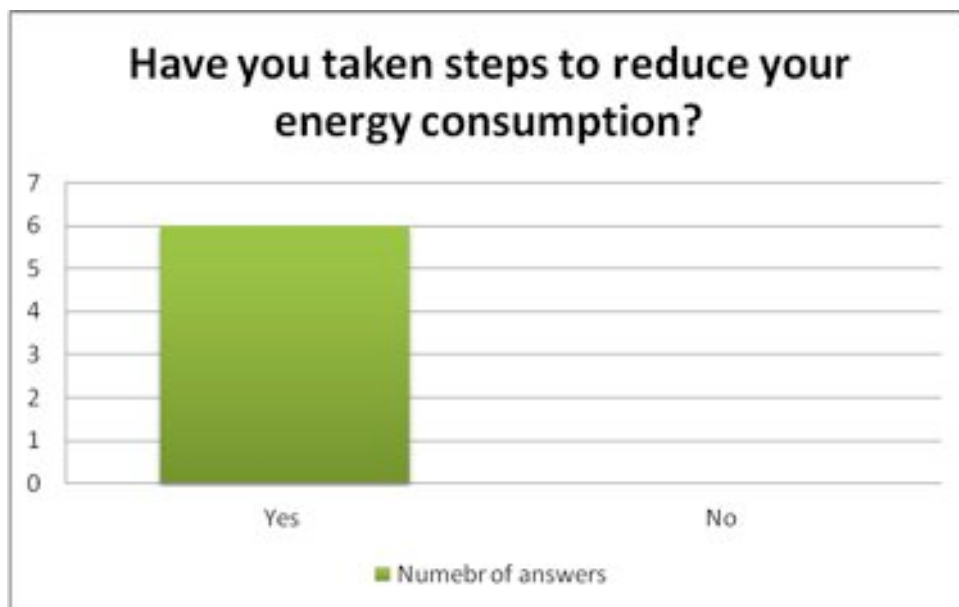
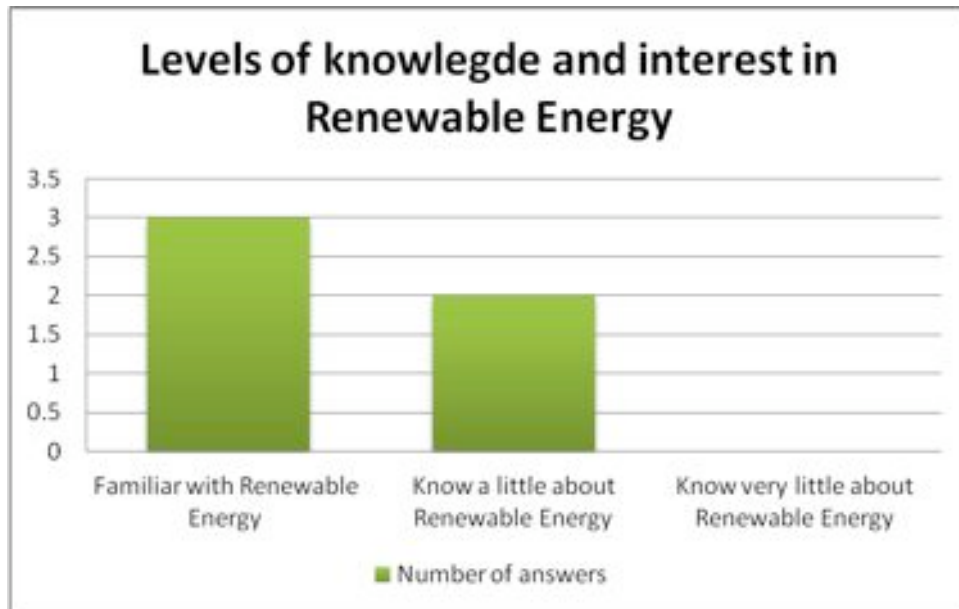
RESULTS FROM FEEDBACK FORMS

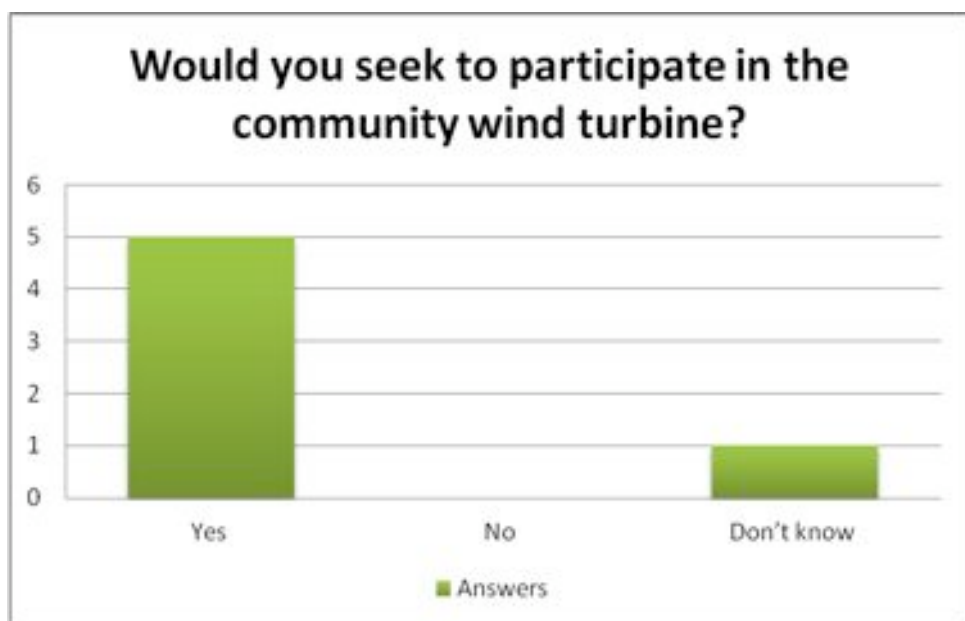
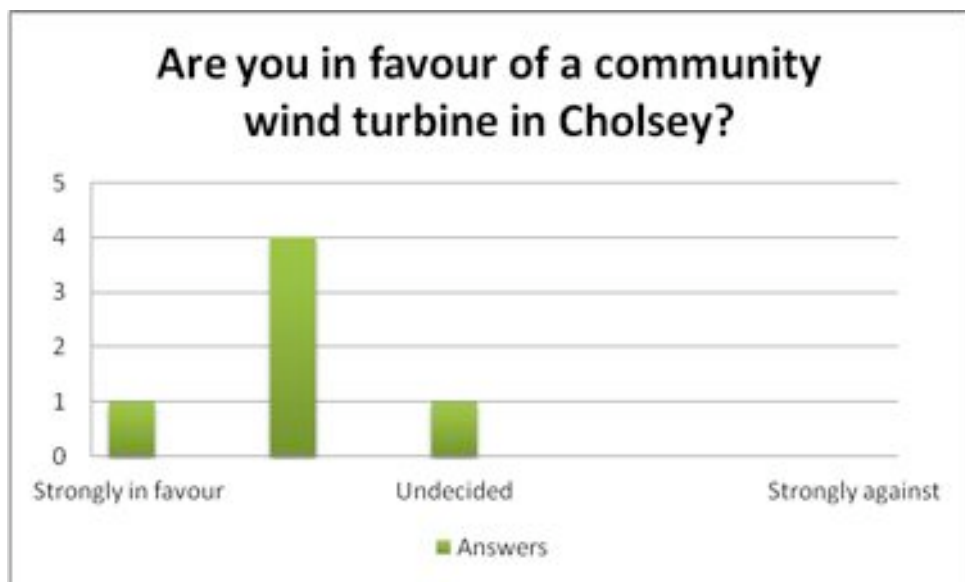
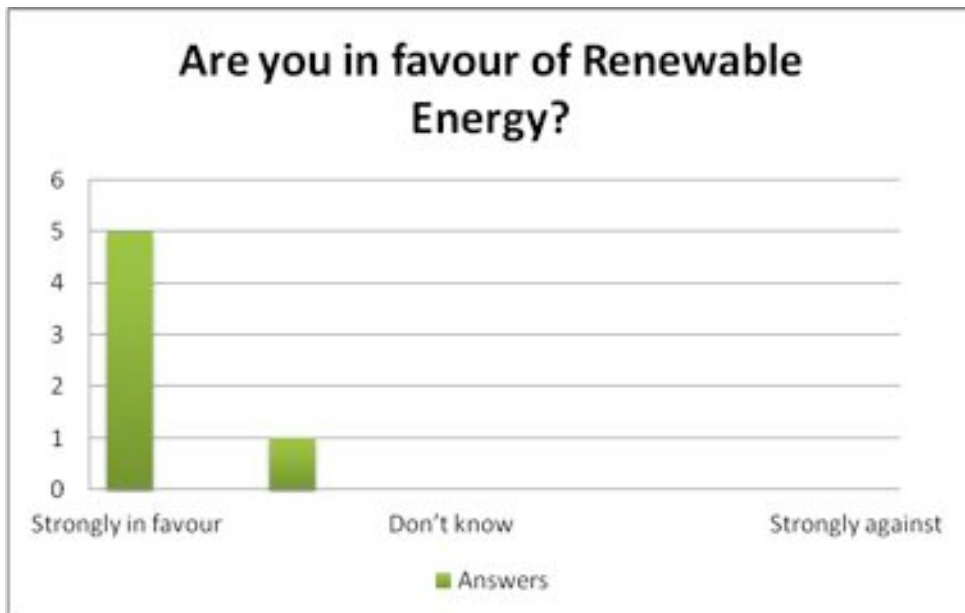
Attendees of the meeting were given a feedback form asking questions about the meeting, renewable energy and their thoughts on a wind turbine in Cholsey. Of the 28 people who attended, 6 completed feedback forms were received. The graphs, below, illustrate the results from the forms.

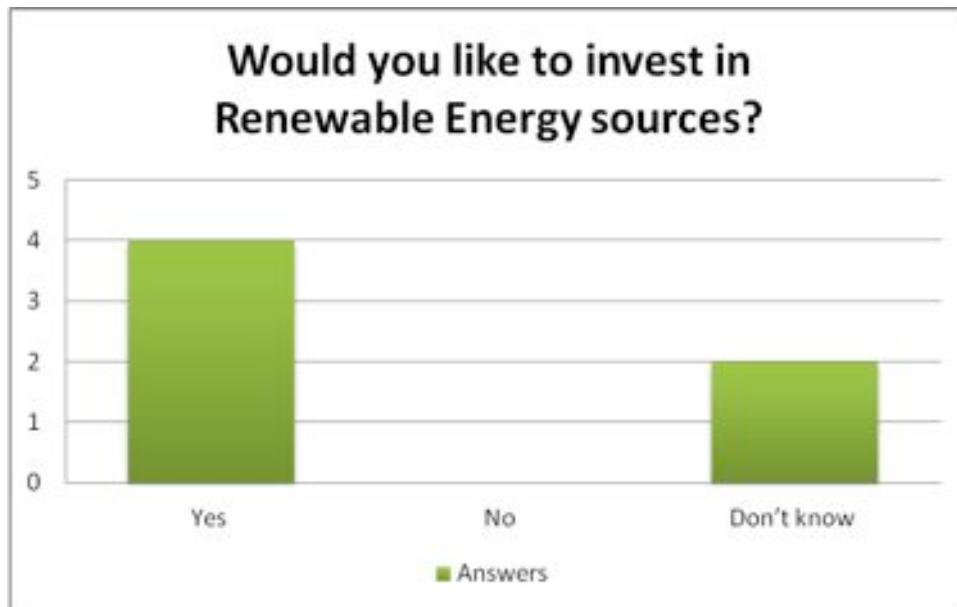


Out of the 6 people who replied 4 voiced their opinion on what the most useful part of the meeting was. Their answers can be seen below:

- ❖ “To hear about the wider issues and wind farms. I also wanted to hear about the experiences at Westmill”
- ❖ “Learning about Renewable Energy co-operatives”
- ❖ “It set my NIMBY radar off!!”
- ❖ “The practicality of Westmill wind farm and their experiences”







The responses above illustrate that there are varied opinions on Renewable Energy and a community wind turbine in Cholsey and indicates that individuals need more information on the topics linked to community projects.

CONFERENCE CONCLUSIONS AND RECOMMENDATIONS

From the meeting, it is evident that there are mixed feelings on the possibility of a community wind turbine on Cholsey Hill which are backed up by the results from the feedback forms. The presentations outlined the salient points of Renewable Energy technologies, in particular wind, as well as giving an introduction on community co-operatives and outlining a successful community wind and solar project. From the meeting it was clear that Cholsey are a long way from actually deploying a community wind turbine on Cholsey Hill and there are members of the public who are strongly in favour and strongly against the idea of a wind turbine.

Other community projects, such as a community solar farm, investment in other Renewable Energy technologies or individuals concentrating on their own energy consumption and efficiency would be good to continue with and more feasible for the near future. It is evident that more progress needs to be made with informing communities of the benefits of a community wind turbine, or other community projects, and it is worth considering the option of smaller turbines in other locations around Cholsey.

APPENDIX 1- MEETING ATTENDEES

Cholsey Renewable Energy Event- Delegate list	
Name	Location and Postcode
Sue Roberts	Sustainable Cholsey
Adam Twine	Westmill Wind Farm
Mike Blanch	BVG Associates
Mary Miller	Cholsey, OX10 9RT
Bryan Regan	Cholsey, OX10 9PY
Nick Issacs	Cholsey, OX10 9QA
David M	Cholsey, OX10 9PA
Leslie Kendall	Cholsey, OX10 9LF
Pam Kendall	Cholsey, OX10 9LF
Michael Woodley	Cholsey, OX10 9LF
Richard Harding	Wallingford, OX10 9DT
Alison Smart	Wallingford, OX10 9BL
David Nixon	Milton, OX14 4EL
Helen R	Cholsey, OX10 9NL
John Appleton	Cholsey, OX10 9NL
Phillipa T	Cholsey, OX10 9LB
Monika Jürgens	Cholsey, OX10 9NZ
Cara Chatterton	Little Wittenham OX14 4O2
Simon Vining	Little Wittenham OX14 4O3
Susan Gopall	Cholsey, OX10 9PZ
Milo Brookes	Didcot, OX11 0AW
Mark Gran	Cholsey, OX10 9LX
Anthony Armitage	Benson OX10 6JB
Frank Gordon	
S Bemead	OX10 9PR
P Bemead	OX10 9PR
Keith Richards	TV Energy
Emily Tomalin	TV Energy
Laura Corfield	TV Energy

APPENDIX 2-CHOLSEY POSTER AND FLYER



APPENDIX 3-PRESS RELEASE



News Information

Issue Date: 22nd February 2012

Public meeting: Proposed Community Renewable Energy Project

Members of Sustainable Wallingford and Sustainable Cholsey invite you to come and discuss the proposed community renewable energy project at Cholsey

The meeting will be held on Friday 9th March 2012 at Cholsey Primary School, Cholsey. Doors open at 7:30pm and the meeting will last approximately 2 hours.

CWTG Cholsey wind turbine group has been going for over 2 years and is looking at the feasibility of a wind turbine on Cholsey hill. A grant has been secured from LEAF by Sustainable Wallingford with the support of Sustainable Cholsey and this funding enables us to hold a public meeting to inform our community all about renewable energy.

This public meeting will bring together local individuals and residents from the surrounding villages of Cholsey, South Moreton, North Moreton, Brightwell-cum-Sotwell and Wallingford to discuss the possibility of using local renewable energy such as wind, solar and biomass projects. The meeting will review the possible impacts and also the benefits for the local area and the community.

Dr Sue Roberts a member of Sustainable Wallingford, Dr Keith Richards OBE and Emily Tomalin of local renewable energy agency TV Energy will facilitate the meeting and will be joined by Mike Blanch of BVG Associates acting as technical consultants along with a founding director of Westmill Wind Farm Co-operative, Adam Twine. Mary Miller will open the meeting and Bryan Regan will close it.

The main topics that will be discussed and presented will be:

- A project overview and context as to how renewable energy relates to overall energy efficiency and sustainability within the local community

- How local people can benefit financially from a community renewable energy project
- An overview of all the relevant types of renewable energy available
- A technical presentation on wind energy and the potential for the local area
- A presentation of a successful local wind farm co-operative case study

The meeting will conclude with a Question and Answer session and will be an excellent opportunity for you to ask questions and to air your views on the proposed project.

Geraldine Kelly of Sustainable Wallingford said “We need to become more sustainable, cutting energy use where we can but also looking at generating energy. Local people are worried about the escalating price of energy, forcing many into fuel poverty. We are worried about protecting our local environment too. We believe using local renewable energy resources offers the best long-term energy solution. This project is a chance to get involved and seek a genuine local community solution that will work for us, our children and our grandchildren. We hope to have a lively and informed debate”.

Dr Keith Richards of TV Energy Ltd said “Renewable energy is coming of age and is already a hot topic of debate across the country. We need more locally produced renewables and in the Thames Valley that comes down to deploying solar, biomass (wood) and wind technology solutions. I want to see local communities defining what works for them, getting involved and having a share in the benefits.”

For all press enquires contact:

Dr Keith Richards

TV Energy, Liberty House, The Enterprise Centre, Greenham Park, Newbury, Berkshire, RG19 6HS.

Tel: 01635 817420

Email: keith.richards@tvenergy.org Web site: www.tvenergy.org

Notes for Editors:

1. The vast majority of the energy we use for our homes, workplaces and transport, comes from fossil fuels – like coal and oil – which generate the ‘greenhouse gases’ that are a major cause of global climate change. Experts agree that climate change is under way – seen in hotter, drier summers and wetter, windier winters in the UK for example – and is likely to get worse unless we take action now to slow greenhouse gas emissions.
2. Energy security of supply is becoming an increasingly fraught matter for the UK as fossil sources of energy in the UK, particularly oil and gas, become depleted. Increasingly, we rely on imports of such fuels from unstable parts of the world such as the Middle East.
3. Energy prices have seen a rapid upward shift in recent years with gas and electricity increasing by some 20% alone in the past twelve months. Government and industry anticipate energy prices will

increase by a further 20 – 40% by 2020 sending more households into ‘fuel poverty’ (defined as requiring more than 10% of disposable income to heat your home).

4. Renewable energy uses free and renewable sources of energy to generate heat and power, such as energy from the wind, sun and water, or from materials which can be renewed, such as wood or animal wastes. These sources of energy do not produce polluting greenhouse gases and are carbon neutral over their life cycle, so they can make a large contribution in slowing the impact of climate change. Examples of renewable energy are solar panels on roofs, wind turbines, and using wood fuel instead of oil or gas, for individual boilers or larger heating schemes.
5. The UK has signed up internationally to satisfying 15% of its total primary energy needs to come from renewable energy sources by 2020. Currently the figure is only around 3.3%. Fiscal incentives such as the ‘FIT’ (Feed in tariff) and the ‘RHI’ (Renewable Heat Incentive) have been introduced by government to try and boost the rate of deployment of renewables.
6. In addition, government see that initiatives with local communities are of primary importance to making the UK more sustainable. Local community ventures are welcomed and seen as the way forward for people and communities to become more involved with satisfying their own energy requirements. This makes people more aware of the impacts of producing energy creating a more ‘energy efficient culture’ as well as offering direct involvement and thus maximising local ‘buy-in’ and benefit from changes that need to take place.
7. This project is one of 82 local energy projects to receive funding from DECC drawing on a new £10m Local Energy Assessment Fund (LEAF). Winning bids include opening show homes to demonstrate solid wall insulation to the public, schemes to check the energy efficiency of homes and invest in renewable energy along with events to promote the uptake of energy efficiency in local communities. http://www.decc.gov.uk/en/content/cms/news/pn12_002/pn12_002.aspx
8. TV Energy works to educate, promote and deliver renewable energy solutions to communities, individuals and businesses. It is sponsored by many Local Authorities across the Thames Valley and a wide range of other public and private sector organisations. TV Energy is a ‘not for profit organisation and is completely independent. For more details on projects, reports and case studies visit www.tvenergy.org.
9. For more information on the WeSET website at: http://www.westmill.coop/westmill_home.asp

On behalf of Sustainable Wallingford and Sustainable Cholsey

Establishing a new balance

SAVE ENERGY

THIS MEANS YOU!



TV Energy

Price hikes, fuel security, infrastructure crumbling

...to meet the demands of a world of 7 billion. Fuel security: 10% oil average. Fuel: 10% nuclear: 10%

...to meet the demands of a world of 7 billion. Fuel security: 10% oil average. Fuel: 10% nuclear: 10%



TV Energy

Energy prices may rise between 40 – 60% more by 2020

TV Energy



TV Energy



TV Energy

Micro-Wind Installations



TV Energy



Community drivers

- New market
- State support
- Energy security
- Reduce carbon footprint
- Government quality of life benefits
- Educational benefits
- Business transformation
- Reduce and/or create jobs

TVE Energy

Government fiscal incentives

- FITED BY SMART (Renewable electricity)
- RENEWABLE HEAT INCENTIVE
- GREEN DEAL

TVE Energy

TVE Heat supply ESCo

- Curious about your existing system?
- There are options to be explored. This year is the time!
- Don't just update boiler systems, think heat supply
- Call back on page
- Digging & forming for pipes increases over the years depending from the heat loss point

TVE Energy

Co-operative renewable energy in UK

- Renewable energy is a generation of energy from the sun
- 100% Renewable Energy (cooperatives) have supplied since 2000
- Building a better world: 100% clean energy generation capacity of 10,000MW
- Not depending on a further 10,000MW of capacity through investment in fossil, conventional generation
- Renewable, 100% owned, 100% community owned, 100% transparent

TVE Energy

Co-operatives share profits

Co-operatives are owned by people like you.

Members of the local energy co-operatives:

- control assets, including the power lines (up to 90%)
- invest in energy resources, if all local stockholders agreed a wind farm nearby and a part from the profits would be shared
- have a say in how the co-operatives spend their money




Community Energy Centres - 100% local control

100% owned, 100% controlled locally

100% of the profits go to the community




How does the community benefit?

- When the co-operatives have their own shares, they can invest in energy resources and share the profits with the community.
- If the co-operatives are owned by a group of people, they can invest in energy resources and share the profits with the community.
- If the co-operatives are owned by a group of people, they can invest in energy resources and share the profits with the community.






Mike Blanch presentation



Technical information on wind turbines



Mike Blanch
 Project Manager (Energy) - Wind Turbine Unit
 01203 851111



Wind World

- 1992 - 1995
- 1995 - 1998
- 1998 - 2001
- 2001 - 2004
- 2004 - 2007
- 2007 - 2010
- 2010 - 2013
- 2013 - 2016
- 2016 - 2019
- 2019 - 2022



Why wind?

- 1. Renewable energy source
- 2. Low cost of energy
- 3. No fuel costs
- 4. No CO2 emissions
- 5. No water consumption
- 6. No land use restrictions
- 7. No noise or visual impact
- 8. No safety issues
- 9. No waste
- 10. No health or safety issues
- 11. No environmental impact
- 12. No social or community issues
- 13. No political or regulatory issues
- 14. No financial or economic issues
- 15. No technical or engineering issues
- 16. No operational or maintenance issues
- 17. No decommissioning or disposal issues
- 18. No security or terrorism issues
- 19. No cyber or data security issues
- 20. No intellectual property issues
- 21. No legal or regulatory issues
- 22. No ethical or moral issues
- 23. No cultural or heritage issues
- 24. No historical or archaeological issues
- 25. No scientific or research issues
- 26. No educational or training issues
- 27. No employment or labor issues
- 28. No trade or international issues
- 29. No tax or fiscal issues
- 30. No insurance or risk issues
- 31. No liability or legal issues
- 32. No public or community issues
- 33. No media or communication issues
- 34. No branding or marketing issues
- 35. No sales or distribution issues
- 36. No customer or service issues
- 37. No quality or standards issues
- 38. No compliance or regulatory issues
- 39. No industry or sector issues
- 40. No global or international issues
- 41. No future or long-term issues
- 42. No uncertainty or risk issues
- 43. No complexity or difficulty issues
- 44. No ambiguity or confusion issues
- 45. No inconsistency or contradiction issues
- 46. No incompatibility or incompatibility issues
- 47. No inaccuracy or error issues
- 48. No incompleteness or missing issues
- 49. No irrelevance or unimportance issues
- 50. No insignificance or triviality issues
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Why wind?




Wind Turbine Technology - Wind Turbine





Turbines - Wind power engineering

Model	Power (kW)	Hub height (m)	Tip height (m)	Tip speed ratio	Capacity factor (%)
1	1000	100	150	8	25
2	2000	120	180	9	30
3	3000	140	210	10	35
4	4000	160	240	11	40
5	5000	180	270	12	45
6	6000	200	300	13	50
7	7000	220	330	14	55
8	8000	240	360	15	60
9	9000	260	390	16	65
10	10000	280	420	17	70



- Key points:**
1. Wind turbine - convert kinetic energy of wind into electrical energy.
 2. Wind turbine - convert kinetic energy of wind into electrical energy.
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 4. Wind turbine - convert kinetic energy of wind into electrical energy.
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 7. Wind turbine - convert kinetic energy of wind into electrical energy.
 8. Wind turbine - convert kinetic energy of wind into electrical energy.
 9. Wind turbine - convert kinetic energy of wind into electrical energy.
 10. Wind turbine - convert kinetic energy of wind into electrical energy.

- Turbine types - different methods of power control**
1. Wind turbine - convert kinetic energy of wind into electrical energy.
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Wind Power Status

Wind is becoming an important part of the energy mix.

EU Targets

- 2020: 12% of gross electricity
- 2030: 17% of gross electricity
- 2050: 24% of gross electricity

Key Points:

- EU has set a target of 17% of gross electricity to be generated from wind by 2030.
- This target is ambitious, but it is necessary to meet the EU's climate goals.
- Wind power is a clean, renewable energy source.

Wind Energy in the EU

EU Wind Energy Production

2019: 110 TWh
2020: 120 TWh
2030: 150 TWh
2050: 200 TWh

Key Points:

- Wind energy production in the EU is growing rapidly.
- The EU is a leader in wind energy production.
- Wind energy is a clean, renewable energy source.

Wind Energy in the UK

UK Wind Energy Production

2019: 10 TWh
2020: 11 TWh
2030: 13 TWh
2050: 15 TWh

Key Points:

- The UK is a leader in wind energy production.
- Wind energy is a clean, renewable energy source.
- The UK has set a target of 17% of gross electricity to be generated from wind by 2030.

Wind Energy in the UK

UK Wind Energy Production

- Wind energy production in the UK is growing rapidly.
- The UK is a leader in wind energy production.
- Wind energy is a clean, renewable energy source.
- The UK has set a target of 17% of gross electricity to be generated from wind by 2030.

Wind Energy in the UK

UK Wind Energy Production

2019: 10 TWh
2020: 11 TWh
2030: 13 TWh

Key Points:

- The UK is a leader in wind energy production.
- Wind energy is a clean, renewable energy source.
- The UK has set a target of 17% of gross electricity to be generated from wind by 2030.

Wind Energy in the UK

UK Wind Energy Production

2019: 10 TWh
2020: 11 TWh
2030: 13 TWh
2050: 15 TWh

Key Points:

- The UK is a leader in wind energy production.
- Wind energy is a clean, renewable energy source.
- The UK has set a target of 17% of gross electricity to be generated from wind by 2030.

Large Block Developmental Steps - 1-3-2011

Example: Planning, Building, Evaluation Model

- Review: 10-15% of total time with the team
- Planning: 20-25% of total time
- Building: 40-45% of total time with the team
- Evaluation: 10-15% of total time with the team

Phase	Planning	Building	Evaluation
Review	10-15%	20-25%	10-15%
Planning	20-25%	40-45%	10-15%
Building	10-15%	40-45%	10-15%
Evaluation	10-15%	20-25%	40-45%

Thank you for attending

Any questions?

Dr. [Name]
 [Address]
 [City, State, Zip]
 [Phone]
 [Email]

[Return to help your students succeed in a classroom](#)

Adam Twine presentation

Community Wind Power

Adam Twine
Westmill Wind Farm Co-operative



Different ownership models

- Cwmrhydydd, Teg and Ail Wyrdd (Llanwril - North Wales)



Earlsburn Wind farm - Strlingshire

Scottish villagers shut developers by demanding extra turbine

How a local group can force a change in a developer's plans



Westmill.org.uk/communities/earlsburn-windfarm

Westmill Wind Farm Collective




Westmill Wind farm



- 100% community owned
- 100% local ownership
- 100% local jobs

Westmill Wind Farm Co-operative Ltd

Westmill wind farm Co-operative Ltd




- Local jobs
- 100% local ownership
- 100% local jobs

Share Offer



A presentation slide titled "Share Offer". It features a large image of a wind turbine on the left. In the top right, two men in suits are shown holding a document. Below them is a smaller image of a wind turbine and a table with multiple columns and rows of data, likely representing financial details of the share offer.

Construction



A presentation slide titled "Construction". It contains two photographs: the left one shows wind turbines under construction at night with site lighting, and the right one shows a close-up of a wind turbine tower and nacelle during the day.

Westmill community fund Westmill - Westmill Sustainable Energy Trust



A presentation slide titled "Westmill community fund" and "Westmill - Westmill Sustainable Energy Trust". It features a photograph of a wind turbine in a green field with a road in the foreground.



Westmill Solar Co-operative



A presentation slide titled "Westmill Solar Co-operative". It features a photograph of a large array of solar panels installed on a flat, open area, likely a field or a large roof.

