

YORKSHIRE & THE HUMBER FARMER & RESEARCHER GROUP

Minutes of a Meeting of the Food and Farming Forum Farmer Group

Farm visit held at: North Side Head Farm, Middlesmoor, Nidderdale by kind permission of Stephen Ramsden.

Afternoon discussion held at: The Crown Hotel, Middlesmoor, Harrogate.

On Tuesday 29th June 2010 – Renewables and Climate Change

Farmer Group Members:

Steve Willis (Chair)
Jim Williams
Rob Copley
Gareth Gaunt
David Hugill
Keith Blenkiron
Robert Borrill
Stephen Ramsden

Present:

Geoff Sykes
Brian Burden
Mike Smith (Quest Future Solutions)
Vicky Wren (CO2 Sense Yorkshire)
Julian Martin (ICE Renewables)

Secretariat:

Deborah Hare (Project Manager)

Apologies for absence

Pauline Teale
Anna Longthorp
Mark Palmer
David Airey
Tim Dunn
Richard Houseman
Edward Sykes
Chris Redfearn
Andrew Manfield

1. North Side Head Farm, Stephen Ramsden

Stephen Ramsden welcomed the group and provided a background to the estate. Stephen led the farm walk informing the group along the way about countryside stewardship schemes, stocking, grouse / pheasant shooting and public right to roam. Stephen highlighted the maintenance of barns and dry stone walls and stated with the economics of farming in the last few years the countryside stewardship schemes have been good to the estate. Hill farming is very labour intensive and Stephen tries to maintain the people (i.e. in his tenants) to manage it, along with a general community spirit.

Prior to looking at the wind turbine, the group was shown the electric boxes in the house. Stephen explained that any electricity produced from the turbine is used in the house and any surplus is sold to 'npower' onto the national grid at 10p/kWh. Stephen does not receive FITs (Feed in Tariffs) as the machine was installed before July 2009, he said he will remain with ROCs (Renewable Obligation Certificates).

The 6kW Proven wind turbine cost £20,000 of which Stephen got a grant for £5,000. The 6kW turbine is suitable for single phase electric, whereas a 15kW turbine would have to be three phase power. The 6kW turbine has a 10 meter mast and the 15kW turbine comes with a 50 meter mast.

The wind turbine is linked to the national grid, if the grid shuts down so does the turbine. A battery system would isolate the turbine from the grid but Stephen's system does not have batteries, so requires a generator to back the supply up if required.

The amount of electricity produced each year has reduced; the first year was 12,500kWh, then 12,000kWh and last year 11,000kWh.

Stephen has seen around a 30-40% reduction in his electricity bills.

Stephen decided to install a wind turbine as the farm is on an exposed site and catches the wind from all directions. Stephen commented that the Gulf Stream which increases temperature in the UK is losing its influence and slowing down, so we may end up with a cooler climate. He believes the change in Gulf Stream is said to be affecting the jet stream (a current of fast moving air/wind speeds), with the jet stream moving further south taking cooler winds from the north. He said there is a lot of high pressure around this year which is causing there to be less wind.

They did not have a planning issue as the turbine is positioned behind a wood. It was remarked that people generally do not like wind turbines near them due to the noise factor. The cable to run the electricity into the house cost £1,100. The turbine requires maintenance every couple of years and is taken down to service it.

It was stated that some isolated farms have electric wires that are not very heavy, therefore the national grid are turning down projects as it would mean they would have to upgrade the connection.

Stephen said there are locations further up the hill from his farm where hydro schemes could potentially be looked at. It was commented that a hydro project has recently been approved at Nun Monkton, and it was also noted that extraction licenses required for hydro schemes can be difficult to obtain. Garth Gaunt said there is a project at Howsham Mill with a water screw, and said with the exception of the screw we will probably just see smaller hydro schemes coming through.

2. **Climate Change – Mike Smith (Quest Future Solutions)**

(Presentation available on www.foodandfarmingforumyh.org.uk)

Key points from presentation

Over the 20th Century we have seen human population quadruple, energy consumption increase sixteen fold and global mean surface temperature increase significantly.

We are seeing a temperature increase of 2-3°C above the norm. It is a trend we should be concerned with.

With UK business and consumers we are seeing changes in supply chains through products, raw materials and food, and are seeing supply chains shortening. Yorkshire has great aspirations to attract industry back to the region.

At UK level, Defra is very serious about climate change, with a 10-15 year strategy looking at areas of transport and energy.

Yorkshire is the 2nd highest flood risk region in the UK. In the region we will see accelerated temperature increase, winter cold spells days reduced and summer heat wave days increased, with an increase in the growing season.

There is an estimated 190 years of coal reserves left.

Climate change can be an opportunity

The shadow price of carbon (SPC) is £26/27 / carbon tonne. The SPC is run by the government, it represents the cost to society of environmental damage. The EU ETS (Emission Trading System) is only 14 Euro / carbon tonne, which has significantly reduced as it has been up at 30 Euro. We are trading in a pollutant that nobody wants, England is a net polluter.

Soil and Carbon

We need to look at the management of land and carbon storage. We can enhance carbon sequestration in the soil; this can be done by not till farming, residue mulching, cover cropping and crop rotation. High-carbon soil acts as a sequestration mechanism, biochar is charcoal created by pyrolysis of biomass. The carbon can be reduced to charcoal which can persist in the soil for centuries, a form of carbon capture and storage.

The government is building carbon penalties into poor soil management.

Around 20% of arable soils have lost organic matter, resulting in less carbon/ha/year. With good soil management we can keep carbon in the soil. There is around 10 billion tonnes of carbon stored in soils. Carbon levels can be increased in soils due to changes in agricultural use, such as forestry and blanket bog management. There is faster carbon growth from bulkier material in scrub growth for example, compared to mature woodland.

In arable land there is around 153 tonnes of carbon/ha, if the land is kept under good management. This figure can change depending on management factors such as soil type, fertiliser, single or double cropping.

Low carbon economy in Yorkshire, see the Yorkshire Forward website for further details.

Carbon reduction efficiency scheme - all companies are trading in carbon, why has agriculture not captured this yet, is there an opportunity to trade in carbon which is locked up in soils?

The above concepts give farming the ammunition and a foundation for a low carbon strategy.

There could be potential to use existing gas and oil field networks in the sea to capture carbon and store it long term. This would be technically feasible but there will be a few issues about scale and economics.

Comments

Stephen Ramsden noted that in the hills this previous winter they could not have sheep on the moor due to the snow, so commented that the weather caused a definite livestock labour input. The field barns which they use to store hay were utilized greatly and they kept the livestock close to them, the cattle are housed for at least 6 months of the year. They had a lot of snow but luckily not much wind, wind would cause a huge infrastructure problem.

Mike said that all the over head cables are prone to snow and ice but they are not geared up for it. Decentralized energy and energy dependence in farming community is very important.

Gareth Gaunt questioned if more wind turbines are put up, if the national grid would put a limit on turbines. Julian said that network operators see it as an inconvenience, the government are trying to push decentralization and DECC (Department of Energy and Climate Change) is pushing FITs for renewables. Gareth commented that FITs is going to bypass those that are connected to the grid.

Mike reported that a Yorkshire regional utility group had been set up to discuss grid connections, and said there is a DTI (Department of Trade and Industry) group stating that we need decentralization, we need access to the grid, it needs to be balanced and we need to mould frequencies.

Stephen Ramsden remarked that if the national grid goes down his wind turbine shuts down for safety reasons, therefore he is reliant on a generator. Mike explained that you can have a battery back up and be connected to the grid.

David Hugill informed the group that under Kyoto you cannot use carbon stored in soil (Kyoto is an international agreement where major companies trade in carbon, countries are signed up to meet emissions reduction targets). The EU ETS fits into Kyoto. David said we need to measure what carbon is actually in soils. Mike agreed and stated that Defra are working on a standard to do that.

It was commented that we may see a carbon tax in 20 years or be dealing in carbon credits. Mike believes that carbon capture is ready, it is not going to happen tomorrow and depends on other factors but we may see something in the next 5 – 10 years.

3. **Farm Resource Efficiency Programme (FREP) – Vicky Wren (CO2 Sense Yorkshire)**
(Presentation available on www.foodandfarmingforumyh.org.uk)

Key points from presentation

FREP encourages technologies that reduce production costs on farm.

Grant rate available of up to 50% and 60% supporting a total project cost of around £50,000.

FREP is delivered on a 'round' basis, with 3 rounds per year. The next round, 'Round 7' is due to open in August, applicants will be appraised early October and a decision date in December.

Workshops are held to help people put applications together.

With renewable projects, no more than 40% of the energy generated can be used in the farmstead.

Technologies that are eligible are:

- Renewable power and heat units
- Rainwater harvesting systems
- Manure management

Wind turbines are now ineligible.

Renewable Energy Online Network – this is a new network area on the CO2Sense website, and is a platform to share and exchange knowledge and participate in discussions. Before you start using the network you have to make a profile and request to be member. See link below:

www.co2sense.org.uk/networks

Comments

Jim Williams has got planning permission for a wind turbine and asked if there was a chance FREP would fund wind turbine projects again. Vicky said that with budget cuts it is difficult to know what is going to happen going forward. Jim commented that his neighbours had received FREP funding for wind turbines before it was taken out, Vicky stated they may have to pay the money back, a decision to be made between Defra and DECC.

Vicky said Solar PV is dual funded but people may have to pay that money back.

Stephen Ramsden said he may have to pay back the £5,000 grant money he received.

Jim Williams stated that we are keen to do things but messages are very mixed. All technologies should be either in or out and applications should be appraised on a case by case basis.

Robert Borrill asked if FREP would look at funding energy saving doors on refrigeration units or dehumidifiers on grain, Vicky advised him to try the Energy Saving Trust for those, but did say that FREP are looking at new technology ideas if anyone wants to put any forward.

4. **Renewable Energy Technology and its Application to Farming – Julian Martin (ICE Renewables)**

(Presentation available on www.foodandfarmingforumyh.org.uk)

Key points from presentation

Farming is becoming the key setting for renewables, with options of wind turbines, solar PV, anaerobic digestion, hydro and heating technologies.

ICE Renewables is increasingly working with farmer groups, as this is very much where the market is going, with more opportunities. Corporate companies tend to have more restrictions.

Key areas to consider are:

- The agricultural industry is a large emitter of greenhouse gases, with potential to be a big part of the solution to global warming
- With the effects of global warming we are seeing temperatures rise, extreme events and population displacement
- By 2020 40% of electricity will be from low carbon sources.

FITs recently introduced in April 2010. Renewable FITs is where the opportunities are. Farmers are eligible for FITs if they install technologies that generate electricity, these include wind turbines, solar photovoltaic (PV), anaerobic digestion (AD) and hydro.

Technologies that generate heat include AD and solar thermal. A renewable heat incentive scheme is due to come in next year, which is something to think about.

FITs pay a tariff for every kWh generated, whether it is consumed or exported back to the grid. If energy is exported back to the grid, an additional tariff is paid.

Wind

Wind is the most popular renewable option on farm, as the return on investment seems to be faster. 80% of ICE Renewable enquiries are for wind.

Different options for wind include:

- The traditional wind farm developer who pays land rental.
- A merchant wind provider who pays land rental and offers to sell green electricity back to the farm.
- Own and operate your own turbine

We are seeing paybacks in 5 years, or even 3 years if turbines are located in a good wind area. The government has set tariffs high for the first few years to kick start the scheme, but these will reduce.

Duration of support provided by FITs for wind is 20 years. FITs pays around 25-26p/kWh for wind.

A wind study is a significant cost to an application, therefore undertaking a study depends on how much risk individuals want to take.

Wind is an intermittent form of energy, on average the capacity factor is 25-30% of output, the natural wind value limit is 59-60%, the capacity factor could not improve on this. Efficiency is often confused with the capacity factor, the turbine is very efficient at converting wind into power. Hydro is 70% as it is continuous, therefore more predictable.

5m per second of wind is industry standard for small scale renewable

6m per second of wind is industry standard for large scale renewable

FITs is financed through energy companies not the government. If electricity price goes up and you have a wind turbine installed the value will come back to you.

Small turbines - <50kW

Medium turbines – 100kW to 500kW

Large turbines - >500kW

Wind turbines 50kW or below have to be certified under the MCS (Microgeneration Certification Scheme) and be installed by an approved installer. This is a scheme that certifies both products and installers to a consistent standard. There is a lot of discussion around MCS on the renewable strategy groups.

10-12kW can go into single phase dependant on the line, so is considered on a case by case basis. 15kW or above is three phase.

Biggest draw back on wind can be the planning.

Comments

Stephen Ramsden advised the group to put in an export meter as he didn't and 'npower' just assume he is exporting 60%. Julian suggested you should have 3 meters to cover; total generation, export and to show what is consumed.

Gareth Gaunt asked about licensing in the EU. Julian explained that the wind turbines are global standards but the UK has put in an extra level of certification in the MCS. This is an issue and barrier to people, but on the installer side it does ensure systems are properly installed by an approved installer.

Solar PV

FITs pays around 30-40p/kWh and can be over 50p/kWh.

A 4kW system covers up to 40m² (about 10m² per kW).

Above a 10kW system is a reasonably large system.

MCS rules apply to Solar PV, you need to look at approved products and installers.

Solar PV can be put in or on the roof to utilize roof space on sheds.

Duration of support provided by FITs for solar PV is 25 years. Paybacks on average are about 10 years with FITs factored in; this is a long time which is why they see more going for wind.

It is an area where there is a lot of development.

Comments

Jim Williams said there is a lot of risk in solar and questioned what the panels would look like in 20 years time. He said the farming press stated if you're located north of Birmingham not to consider it. Julian explained solar has to be looked at on a case by case basis and under the MCS rules a calculation has to be done.

Anaerobic Digestion

Biogas from waste and digestate, with production of electricity and heat. Returns on investment are very attractive, with less than 5 years payback with FITs factored in.

Hydro

The potential for hydro in North Yorkshire is very high. It requires a bespoke solution.

FITs pays around 17p/kWh for hydro. Less than an 8 years payback is possible.

Solar Thermal

Producing renewable heat, solar hot water is used to heat water particularly in dairy farming. Returns take quite a long time.

Julian advised to take advantage of the best rates of FITs as the tariff rate is highest in the first few years and they will then reduce.

Julian also advised to try and get the installation behind the meter so you can benefit from consuming and export energy.

There is a big push on the electricity side with renewable, and we will see a big push on the heat side next year.

Comments

Gareth Gaunt said there will be far more localized small scale, micro generation schemes and an interest in micro grids. The biggest drawback is if businesses opt for wind, if there is no wind there is no electricity.

Gareth said a way for the future is hydrogen production and storage, but it might cost too much money. Julian said we are not that far away in terms of storage and can convert to hydrogen, giving the example that New Holland has produced a tractor run on hydrogen.

5. Next meeting topic ideas

The group was asked for ideas for future meeting topics.

Gareth Gaunt commented that we need to know a lot more about carbon and suggested possible speakers to talk to the group, Jonathan Wilde and someone from the United Bank of Carbon.

It was decided that the next meeting in October we would arrange to go to Loughborough to continue the renewable debate. Gareth has a contact there called Professor Tony Marmont who has done a lot of work around clean energy technology for the future.

David Hugill commented that there is a shortage of commitment from farmers to take the lead in renewables, informing the group that FWAG have been doing a lot of work in this area and questioned if the farmer group would be a good base.

Action: D Hare to liaise with G Gaunt to arrange the October trip.

Food and Farming Careers Event

Steve Willis informed the group about a careers event being planned for September / October. The main aim of the event is to increase awareness of the highly skilled food and farming career opportunities to careers advisors. We will be looking for support from the farmer group for this event.