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P & L Cook and Partners



## Arable Monitor Farm (Angus)

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Report on Meeting held 15th June 2010  
Farm-scale Renewables

**Next Meeting: Tues 2<sup>nd</sup> November**

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## **TOP TIPS FROM MEETING**

1. Renewable energy can represent a great opportunity for farmers, providing a long-term income stream. While large scale developments have struggled to gain planning permission in the face of strong opposition, farm-scale schemes are sometimes viewed more sympathetically by planners. The starting point is to establish what natural resources are available to you. For example, for a wind turbine it is believed the minimum wind speed is 6m/s to ensure economic viability.

### **1. INTRODUCTION**

The focus of this meeting was on farm-scale renewables. There is considerable interest in renewable energy which received a further boost with the introduction by the Government of the new 'feed-in tariff scheme' (FITs) in April. The FITs are specifically designed to encourage the installation of small-scale renewables. They provide long-term guarantees for farmers on suitable sites to exploit a new diversified business. The economic viability is even more advantageous if you are a major electricity user e.g. refrigeration store.

One of the aims of the meeting was to hear the experiences of farmers who have embarked in the different renewable technologies. Unfortunately, on the day David Murray, Lurgan Fm, Aberfeldy, (900kW hydro scheme) was unable to make the meeting

### **2. Review of Renewable Technology (Jim Campbell)**

Jim Campbell, SAC Environmental & Design, provided the Group with a review of the range of available renewable technologies.

#### **Key points:**

- Power is measured in Watts, normally kilowatts (KW). 1KWh = 1Kw for 1 hour.
- Energy cannot be created or destroyed.
- There are a range of renewables for generating electricity; wind, hydro, solar and biogas.
- 'Capacity factor' is a measure of the efficiency of a system. Wind turbines in a good site, will have a 30 – 40% capacity factor.
- Farmers /land owners can either develop their own schemes or lease to a developer to exploit – normal for major wind farm developments.
- Government policy to stimulate renewable sector through *Renewable Obligation Certificates* (ROCs) or new Feed-in Tariffs (FITs). ROCs is for large schemes (> 5MW). Schemes between 50kw and 5MW can choose FITs or ROCs.
- Under new FITs scheme (April 2010) payments in 2 parts; generation tariff and export tariff (min price if electricity sold to grid). Payments guaranteed for 20 years and index linked – see table 1 below.
- FITs is funded through the market; consumers paying more for their electric – so not dependent on government funding.

- A typical 15kW wind turbine will cost £55-60,000, hub height 15m, on a site with a mean speed of 7m/s (at 25m above ground) will take 7 years to payback.
- A 2.3MW wind turbine will cost £2.2-2.6M, hub height 80m, on a site with a mean speed of 7m/s (at 25m above ground) will only take 4 years to payback.
- The main issue for wind turbines is securing planning permission. The main concerns include: visual impact, noise, impact on radars, birds, shadow flicker, telecom interference, access and archaeological.
- Some Local Authorities more enthusiastic than others.
- Hydro schemes viability dependent on 2 factors; water flow rate and head.
- Will require water use licence from SEPA
- Under SEPA draft guidance, hydro schemes of 100kW or less, require 1 in 10 slope or more to be viable.
- Low head schemes generally are more expensive
- Need to have 10kW plus hydro scheme to be economic

Table 1: Feed-in Tariffs

Technology	Scale	Yr 2011	Yr 2012	Yr 2013	Life time
Anaerobic digestion	< 500KW	11.5	11.5	11.5	20 yrs
Anaerobic digestion	> 500KW	9.0	9.0	9.0	20 yrs
Hydro	< 15kw	19.9	19.	19.9	20 yrs
Hydro	>15-100kw	17.8	17.8	17.8	20 yrs
Hydro	>100kw –2MW	11.0	11.0	11.0	20 yrs
Hydro	> 2-5MW	4.5	4.5	4.5	20 yrs
Wind	>1.5-15kw	26.7	26.7	25.5	20 yrs
Wind	>15-100kw	24.1	24.1	23.0	20 yrs
Wind	>100-500kw	18.8	18.8	18.8	20 yrs
Wind	>0.5-1.5MW	9.4	9.4	9.4	20 yrs
Wind	>1.5-5MW	4.5	4.5	4.5	20 yrs
PV	<4kw (retrofit)	41.3	41.3	41.3	25 yrs
PV	>4-10kw	36.1	36.1	36.1	25 yrs
PV	>10-100kw	31.4	31.4	31.4	25 yrs
PV	>100kw-5MW	29.3	29.3	29.3	25 yrs

### 3. Farm-scale Wind turbine – Julie Duncan

Julie Duncan, Balkemback Farm, Tealing shared her experiences of installing a 11Kw Gaia wind turbine.

#### Summary:

- Originally limited choice for small-scale wind turbines (Proven or Gaia) now much wider choice
- Installed a 11kW turbine in December 2008, cost £40,000 (now £58,000), received £14,000 grant under SRDP.
- The turbine is 18m in height and is sited adjacent to the farm stading
- On ROCs as FITs was not available at the time. Not eligible for FITs as the turbine installed before July '09 – as a result estimate lost £90k.
- Foundation for the turbine 5 m<sup>2</sup>
- Only took a day to erect the turbine on site
- Machine is very reliable, service only once per year , £500

- Connected direct to 3-phase on farm, no expensive grid connection
- Produced a total of 26,500 kWh in 2009. So far production in 2010 is 25% down.
- Julie is delighted with the performance of the turbine and is considering a number of future developments including a possible hydro scheme and a larger wind turbine.
- Submitted a planning application for a 80kW turbine, 2 blades, costing approx £230,000.

#### 4. Anaerobic Digestion – Jim Booth

Jim Booth, SAOS, provided the Group with a brief review of the practical challenges in making farm AD a success.

##### Key points:

- AD is the process where micro-organisms breakdown biodegradable materials, in the absence of oxygen, to produce biogas. The biogas can be cleaned and used to fuel a CHP unit to produce electricity and heat.
- Wind turbines now proven technology in the UK, however, AD is still in its infancy and early stage of understanding. At present there is only one commercial AD plant in Scotland – Rennie’s Gask plant, near Turriff.
- An AD plant has 4 potential income streams;
  - Sale of exported electric to national grid
  - FITs (or ROCs) for renewable energy
  - Gate fees for imported waste
  - Revenue from surplus heat – ‘renewable heat incentive’ (RHI)
- There are 2 different models emerging; ‘farm based’ feedstocks or ‘hybrid’ using imported waste. Trend is towards farm-based feedstocks as less risk and lighter compliance regulations.
- The cost of entry is high, a 0.5MW AD Plant would cost in excess £1M. Economies of scale exist, although there are no independent figs it is believed the min size is > 350kW.
- Successfully operating an AD plant is demanding. Unlike a wind turbine, it doesn’t operate itself once installed.
- A recent study has identified a number of barriers for the development of farm-based AD, these include:
  - Feedstock supplies – no 1 issue
  - The high capital cost
  - Uncertain return and inherent risks
  - Complexity & uncertainty
  - Funding issues – risk capital
  - Legislative compliance burdens
  - Disposal of the digestate – QA schemes
  - Access and cost of grid connection
- On average it takes 2-3 years for the development of an AD plant. The key stages of the process is provided in Appendix 1.
- SAOS are keen to support farmers who are interested in AD, particularly a multi-farm approach. For further information contact Jim.

## 5. Finance & Tax issues – Mark Barron

Mark Barron, from EQ Accountants, summarised the key issues relating to finance and tax for renewable energy developments.

### Key points:

- It is important you undertake a feasibility study for any proposed scheme and prepare a business plan if taking a project forward
- When undertaking a project evaluation it's important to include all costs e.g. consultants fees, grid connection, planning costs, on-going maintenance, tax, etc.
- Key decision criteria is; return on investment, payback period, risk assessment, and likelihood of success.
- Sources of funds include; own capital, grants, and bank loans. Banks may require to secure loan against other assets (e.g. land).
- Trading structure - if small-scale, could put it through existing farm business or establish a separate business.
- Capital allowances for tax purposes is £100k of annual investment allowance (AIA), 20% of written down allowance.
- Note, FITs are subject to income tax
- Inheritance tax – if trading through the farm, no change to position. However, if land rented to separate company for sites. may endanger APR.
- It is important when you are considering a new renewable project you consult your accountant for specialised advice.

## 6. Grain Market Update - Ian Keith

Ian Keith, from Frontier based in Aberdeenshire, provided the group with an update on the combinable crop market prospects.

### Summary

#### Wheat

- USDA predict the 3<sup>rd</sup> largest wheat crop this year.
- The global recession has caused a reduction in wheat demand, so building up wheat stocks, 200MT
- The weakness of Euro is moving against us, was 95p at peak, currently 83p/€
- Currently speculators piling cash into cereals futures, selling short so have very 'bearish' outlook
- Very few active buyers at present, all have stocks to use up
- The UK is forecast to have +2 MT compared to last year. Scotland forecast to produce extra 200,000t wheat this year.
- New Ensus plant will have impact but currently shut down commissioning problems

#### Malting Barley

- The area planted reduced. Increase in feed varieties, approx 2/3 of spring barley malting varieties.
- Could have a small deficit in malting barley this year but Maltsters have large carryover.

## **Ex-farm prices for harvest 2010**

Wheat	£115/t
Feed Barley	£90/t
Malting Barley	£110/t
Oilseed Rape	£245/t

### **Summary**

- Short-term prospects not good
- Important producers know their production costs so can sell at a margin when opportunity arises
- If you have grain to sell, try and hit spikes
- Watch production updates due to dry summer in Europe and Black Sea countries.
- (Since the meeting, the future markets has gained £15/t so worth considering as a spike selling opportunity)

## **7. DATE OF NEXT MEETING**

This was the last meeting of the summer with the final meeting of the project to be held post harvest.

**Tuesday 2<sup>nd</sup> November 2010, 9.30am** - final meeting of the project

## APPENDIX 1

### The AD Development Process

Stage	Description
1	Gather Information
2	Approach Partners' /Feedstock issues
3	Identify suitable site
4	AD Manufacturers
5	Grid Connection feasibility
6	Feasibility Study
7	Business Plan
8	Legislative considerations
9	Pre-application consultation with Planners
10	Impact Assessment
11	Planning Application
12	Project Finance
13	Legal agreements
14	Order AD Plant
15	Civil Works
16	Install and commission AD Plant
17	Ofgem Registration
18	Operational Management

Source: SAOS