



**“Sustainable Living in a Protected Landscape Conference”
Raven Hall Hotel at Ravenscar in the North York Moors National Park
Tuesday 19th October 2010**

1. Opening of the Conference

The conference was opened by Michael Graham, Assistant Director of Recreation and Park Management at the North York Moors National Park Authority (NYMNP). Michael introduced himself as the Chair of the Conference. He went through general housekeeping before outlining the conference proceedings.

2. “Welcome to the North York Moors National Park” by Andy Wilson, Chief Executive, North York Moors National Park Authority

Andy Wilson welcomed delegates and made two points regarding the sustainable management of National Parks:

- National Parks are regarded as “pretty.” Although it is easy to dismiss aesthetics, there is a lot of value entrenched in quality of life, landscapes, and spiritual awareness which is central to our sustainable future. There needs to be a move away from consumption towards sustainability. The National Park Authority has approved 83% of renewable energy applications. Some were turned down as they were “ugly.” There needs to be a better appreciation of the local environment,
- The National Park Management Plan looks at production in the Park e.g. timber, renewable energy etc. Questions are asked including how much renewable energy production can there be without compromising the qualities of the National Park.

3. “Renewable Energy and Energy Conservation in a Protected Rural Area” by Rebecca Willis, the Vice-Chair of the UK Sustainable Development Commission

Having worked in the Lake District National Park, Rebecca Willis opened her presentation talking about carbon footprints. Carbon footprint calculations have been produced for countries all around the World. The UK has a carbon footprint nine times the size of the Earth. An equitable share of global carbon would result in a 1.85 tonne allowance of carbon per person.

Rebecca outlined the Government Framework for tackling climate change. With carbon reduction targets of 80% carbon reduction by 2050 and 34% by 2020, a progress report has been produced which identifies issues affecting the achievement of the targets e.g. impact of the recession and policies.

What is needed to meet the carbon targets?

- Renewable energy,
- Carbon pricing,
- Energy efficiency,
- Agriculture and land use.

In 2006, 695 million tonnes of carbon dioxide (CO₂) were emitted. This needs to reduce to 159 million tonnes of CO₂ by 2050. The primary focus is carbon-free electricity generation (renewable energy, nuclear power, carbon capture and storage), followed by domestic transport.

David Cameron made a pledge to become “the greenest government ever.” This emphasises the high level of commitment towards achieving low carbon living.

Rebecca drew the audience’s attention to the publication “Prosperity without growth” by Tim Jackson, 2009.

768g carbon/\$ spend is being produced now. The IPPC target is 6g carbon/\$ spend.

One criticism is that the approach misses out the local community angle and the sustainable energy community focus.

Rebecca switched her attention from the National picture to the community angle by discussing the ‘Low-carbon Lake District’ initiative. This project involves:

- Carbon budget for the National Park,
- Partnership working,
- Leadership group,
- Action on low carbon tourism, energy efficiency, renewable energy and transport,
- Changing the way people think about climate change.

The carbon budget is designed to mirror the national budget. It is a consumption-based approach and provides a carbon snapshot of visitor transport (including aviation), accommodation, food and drink etc.

Questions are being asked including:

- Is there scope for renewables on a community level?
- Could the National Park be self-sufficient?
- Could Cumbria become a net-exporter of renewable energy?

Renewable energy developments in the National Park include:

- A focus on hydro power including pre-feasibility studies and a hydro scheme for Coniston,
- The availability of small-scale funding through the Sustainable Development Fund (SDF),
- The new Core Strategy for planning specifies that all new housing must be able to generate 10% of their own energy through low carbon energy generation,
- Advice is available before planning applications are submitted,
- Renewable energy outreach role including engagement and myth busting,
- Creation of the Cumbrian Renewables Panel.

There is also an emphasis on making personal connections to combat climate change. A central theme is green behavioural change. Triggers can be found in National Parks including starting a family, retirement etc.

Rebecca closed her presentation by saying that pure carbon savings from renewable energy is dwarfed by the carbon dioxide impact from aviation. However, community schemes, community-led schemes and changes in local behaviour play a key part in meeting National carbon reduction targets.

Questions and answers

Q: Has the 10% low carbon energy generation for new developments being considered by the NYMNP?

A: NYMNP may not have been ready at the time to add this commitment to their Core Strategy.

Q: How can you manage landscapes to maximise energy gain and carbon footprints? You can get maximum gain from hydro projects but this often results in a change in landscape to maximise water flow.

A: An example was given of the “Carbon Landscapes Project” which had a focus on land management including woodlands and agriculture.

Q: How does renewable energy fit into David Cameron’s Big Society?

A: Easy to do large-scale wind. Difficult for the individual householder. “Cumbrian Community Renewables” fund proposal where community can do it for themselves but need the right framework. Enabling focus.

Q: Do you engage local professionals in the projects?

A: Yes but not too much. Through the Cumbria Green Build Festival, they are hoping make contact with professionals living and working in the National Park.

4. “Sunflower Partner Projects Presentations” by various presenters

Michael Graham introduced the Sunflower Project to the delegates. Funding for this project ends in February 2011. Michael introduced the three speakers:

“Bilbao Technology Park” by Christina Andres

The Basque Country is a small region in the North of Spain. It has a population of 2 billion people.

Bilbao Technology Park was established in 1985 and was the first Technology Park in Spain. It is 70% owned by the Basque Government, 30% owned by the Basque Regional Council and also has Town Council input. The Technology Park actively participates in networks within the Basque Country and on a State and International level.

Within the Park, companies include innovation and communication technologies, energy and environment, science, and research and development (R&D). In total, there are 225 companies. 25% of people working in the Park are research focused.

The Technology Park offers:

- Space rental,
- Developed plots of land,
- Innovation promotion e.g. Zero Hytechpark, BTEK Technology Museum, Training and Diffusion seminars, advance support services,
- Sustainability and Environment Forum.

Park is of important environmental and sports and leisure value.

“Healthy Cities, Towns and Regions” by Antonin Tim, Czech Republic

Within the Czech Republic, the focus on health has been the main driver of sustainable development issues including renewable energy and transport. The methodology for cities is to:

- Develop sustainable strategies and partnership working,
- Focus on energy and transport issues,
- Share information and good practice,
- Raise awareness and utilise media including radio and TV, and
- Organise study tours for young practitioners and students including European tours.

Portugal

In Portugal, there has been a focus on energy policy, sustainable development and energy efficiency. Projects are focussed on dissemination and promotion of sustainable energy including energy planning, policy and climate change.

TV Energia is a web-based TV channel on energy and end-use efficiency. Visit: www.tvenergia.tv

Studies/projects include:

- Barriers in storage technologies, visit www.storiesproject.eu for more details,
- Hydrogen research and applications including the switch from diesel generation in isolated villages to hydrogen and PV to cover the basic electrical needs of these populations. Continuity is also ensured after the end of the project,
- Eden Project - hydrogen economy utilising wind turbines and fuel cells (street lighting at night),
- ENNEREG - Sustainable Energy Action Plans and Projects. Emphasis on the replication of projects,
- Regions 202020 project, visit www.regions202020.eu for more details,
- Some studies are also available on the Sunflower website.

The Chair introduced the Sustainable Development Fund (SDF) which began in the NYMNP in 2003. The SDF has a community and innovation focus resulting in funding awarded to projects including Bioflame, Econoplas, Anaerobic Digestion Feasibility Study and Ridgeblade. The latter two initiatives gave the following presentations at the conference:

5. “Potential for Anaerobic Digestion Projects in the National Park” by Dr Graham Hiller, Directory of Strategy and Futures, Centre for Process Innovation, Middlesbrough

The Centre for Process Innovation (CPI) was established by One North East to support process industries. CPI is largely industry focussed and includes processes including printable electronics including organic PV and fuel cells. CPI’s assets include testing labs. A number of spin out businesses have also developed.

Dr Graham Hiller emphasises the resource challenge facing the UK. As noted by the Bruntland Commission, sustainable efficient systems are needed. There needs to be a balance between economic, social and environmental factors. All are equal. We face many challenges including population growth, growing affluence and resource consumption. The carbon dioxide in the atmosphere rises with population.

The challenges facing rural communities are:

- Security of energy supply,
- Managing and disposing of waste,
- Energy pricing,
- Cost of supplying services is rising.

Anaerobic digestion (AD) turns waste into something of use:

- Organic waste is used as a feedstock,
- The waste is put in a pot without air where natural bacteria turn it into methane, nutrients and carbon dioxide. The remaining digestate can be used as a fertiliser (or soil conditioner).
- The loop is closed,
- No external energy is needed to make it work.

The UK agricultural waste stream comprises of 90 million tonnes of waste and 16 million tonnes of food waste. This waste could be utilised in 2,000 AD plants which could convert the waste into electricity, heat, gas and fertiliser. Graham used a flowchart to illustrate the application of AD.

Although you cannot put AD gas into the national gas grid, you can use the gas yourself or use it to generate electricity.

Examples of AD projects include:

- Newcastle University AD Research and Development (R&D) plant using pig manure. An AD plant typically costs £400,000-£500,000 at the moment,
- Asden Rwandan Prison AD - see the Ashden Awards website for more details.

There are opportunities for AD throughout the UK including National Parks. The NYMNP project comprises of:

- Feasibility study to explore projects (ones which are economic),
- 26,000 population,
- 90 villages,
- 1,300 farms,
- AD is eligible for Feed-in Tariffs (FITs),

- AD is not an easy answer - need to agglomerate communities to pool feedstock,
- Opportunities for projects in Helmsley and Kirkbymoorside,
- AD Development Centre and Eco-Innovation Programme - focus on next-generation technologies that are 3-4 years away from being available,
- Initial indications for FITs = 3-8 year payback.

The following work is needed to finish the study:

- Assessment of sites using conventional AD technology,
- Identify suppliers of small-scale technology,
- Develop novel small-scale plants,
- Assess economic viability

Outcomes:

- 1 or 2 sites on edge or in the National Park,
- Use resources in National Parks.

Feasibility study available in November 2010.

For more information, visit www.uk-cpl.com

Questions and Answers

Q: What size of population may be viable for a community-based AD scheme?

A: 10-15,000 people or 2-3 large pig farms.

Q: How does AD work fit in the North Yorkshire County Council Central Waste Management Policy?

A: Council approach is different from a community approach. A starting point is incinerator combined heat and power (CHP) for dry waste and AD for wet waste. Teesside Incinerator takes waste from Northumberland.

Q: What size of dairy farms would be eligible?

A: Two dairy farms.

Q: Do you educate people on waste reduction? How does making less waste (not feed the beast) tie in with AD?

A: We do need to reduce waste and become more efficient. However, CPI is not funded to do this. CPI has a technology focus. Social behaviour is complex but CPI is not involved in this.

Q: Is there low cost workable technology available?

A: Although there are regulations, the work of the CPI has a low cost focus. The gas needs to be cleaned to make it environmentally sound. The ideal solution would be to develop on-site community based AD projects where the gas is fed into the national gas grid (this would also need standard and regulation development).

Q: Does AD need grain to work?

A: Grain is not needed. Grain is used in bio-ethanol plants but not AD plants.

Q: Would an AD project in Kirkbymoorside need co-operation from the sewerage plant?

A: AD plants have long existed on sewerage plants. In Kirkbymoorside, AD could be developed on the existing sewerage treatment works. In the UK, we cannot put human sewerage on the land as a fertiliser to grow food.

Q: What is the cost of a small-scale AD plant?

A: £20,000-£30,000 investment with a 5 year payback.

6. “Ridgeblade: An Innovative New Wind Turbine” by Dean Gregory, The Power Collective Limited

Dean Gregory began by giving an insight into the development of the Ridgeblade turbine. The main driver was to install a sustainable energy device on a house that would be cheap, effective and widely available to people. Dean introduced the technology which harnesses the flow of air on and over roofs. At Delf University in the Netherlands, R&D was carried out on air flow around a house. Air flow on the roof is 2.5-3 times faster than the ambient air speed in a small area on the roof. Therefore, they worked on developing a system that would get the maximum energy from air flows on the roof.

The unit is produced in any colour including slate grey and pantile red. It is a modular unit measuring 1.2 m long. The units connect together with a small generator at one end. The unit does not have a peak performance rating; rather it generates low levels of electricity. It harnesses 70% of the wind rose.

Prototypes have been developed which can be used on most buildings. A Ridgeblade system on a 3 bed semi with 6m roof is likely to cost £3,500-£4,000 and generate 15 kilowatt hours (kWh) per day. With FITs, this results in a 2 year payback. The units are fitted onto the roof using uniwrap (like solar). Scaffolding is not needed. They can be installed by solar installers and roofing experts.

Timeframe for development:

- Production started in September 2010,
- Units will be delivered in November 2010,
- Testing will be conducted on agricultural and light industrial buildings and domestic dwellings,
- Test sites include the Esk Valley, York and Harrogate Housing Authorities and 2 national supermarket chains.

What's next?

- Testing to obtain robust data,
- 2 units tested in the Netherlands (export sales),
- UK sales unlikely in the next 12 months,
- Seeking MCS accreditation for the product although difficulties have been encountered as the focus of the scheme appears to be vertical axis and horizontal axis wind turbines only.

The company would like to manufacture the units locally to keep their carbon footprint as low as possible.

Half a million installation would reduce the need for a medium coal fired power station.

Questions and Answers

Q: Ridgeblade are underselling the payback when compared to horizontal axis wind turbines

A: The Company need robust figures before they can say anything concrete.

Q: Are they noisy?

A: This will form part of the testing of the product. The blades and unit have been carefully designed so that the unit cannot be heard above the wind noise.

Q: What is the carbon content of the manufacture of the turbine?

A: The Company are looking into using recycled steel and plastic to reduce the carbon footprint of the product.

Q: How will the electricity generated from the turbines be metered?

A: The Company are investigating the options. Inverters used for PV are not suitable for Ridgeblade. One option is for the company to develop their own inverter

Q: What is the peak output?

A: The unit is regulated to 2.5kW. The unit has a shroud to mask it in high wind speeds.

Q to the Chair: Congratulations to the National Park Authority (NPA) in supporting this project. The main challenge facing its future development appears to be the MCS scheme. What does the NPA plan to do to help Ridgeblade overcome the bureaucracies impeding its development>

A by Andy Wilson: The NPA intent to lobby the DECC Minister to change the MCS.

A by a NPA Planner: Micro-renewables as permitted development. Thing government is thinking about looking into this - noise and vibration.

7. “Sunflower Partner Project Presentation for Italy” by a representative from Environment Park, Italy

The speaker introduced the concept of the Environment Park as a space for small and medium sized enterprises (SMEs), research bodies, start-up businesses focussing on renewable energy, reducing consumption and R&D.

The Park has a Green Building Criteria and comprises of low carbon buildings. Low carbon energy sources include:

- Wood chip for heating and cooling,
- Solar PV plant for hydrogen production,
- A 435 kW hydro electric plant.

When electricity production is higher than the electricity consumption of the Park, the electricity is sold to the National Grid.

The Park covers 30,000m² and contains 70 SMEs, 500 employees with an average age of 35 years old!

Real estate management and R&D have a number of Environment Park Open Labs:

- Hysy Lab specialises in hydrogen technologies for mobility and stationary applications,
- Bio-energy Lab
 - Second generation biomass including biogas production and reduction of nitrate content in livestock effluent,
 - Two pilot plants - one in feedstock testing and application, and the second is a biomass pre-treatment plant,
 - Gas Highway Project - CNG and biogas distribution network in Europe (not near the UK!)

A comprehensive network has been developed from Finland to Italy to share best practice.

Other projects include:

- SEBE project - biogas production and exploitation of the potential of organic waste, comprehensive experience,
- DENITREN project - sustainable system for developing, implementing and maintaining livestock effluent treatment by the growth of algae for use on the farm.

8. “Sunflower Partner Project Presentation for Italy: An Agroenergies Project” by Piero Mattiolo,

In 2008, private farmers and industry came together to lobby the Government and develop joint initiatives in the area. Events and seminars were organised to bring technology to farmers and local authorities (responsible for planning permissions). The project sought to develop R&D, sustainable development and jobs for young people in the community.

Milestones included seminars throughout Italy, development of the US market, active in research. Technologies in use in the area comprised of:

- On-farm
 - Biogas co-generation,
 - Biomass,
 - Hydro power,
- Long supply chain industries
 - Bio-diesel,
 - Bio-ethanol,
 - Wood pellets,
 - Biomass combustion

With biomass gasification and co-generation, there is an incentive for power producers to develop intelligent heat production.

Key driver in Italy = FITs for business, biogas, vegetable oils for transport, and PV.

New incentives for 2011 = smaller plants.

Biogas plants have a flat FIT incentive up to 1MW which has increased the number of installations.

Lessons learnt:

- Concentrate on better usage of heat as 15% of energy content is lost,
- Up-grade biogas and micro-nets to make them more viable at a small-scale,
- Leading on a project for small-scale device based on membrane technology.

9. “North York Moors National Park Community Renewable Energy Project: Lessons Learned” by Peter Jones, CREP Officer

Peter began by introducing the Sunflower Project to the delegates. The main aim of the project was to create conditions to attract investment in renewable energy projects. There are 8 project partners who meet to share information and experience. The project goals are:

- To trigger Local Authority investment in renewable energy plants,
- To ensure that energy resources are considered as a starting point rather than an add-on,
- To educate people and encourage young entrepreneurs into renewable energy generation,
- To develop a community renewable energy vision in line with European targets.

In the NYMNP, there are a limited number of practitioners working with local groups in the National Park.

Peter outlined the purposes of the National Park and duty of the NPA including the need to protect and conserve the character of the National Park and foster the well-being of local communities. The National Park comprises of 1,400 km², a population of 25,000 and 34% moorland. Climate change means that things are happening to the environment and there is a growing need to have control over the impacts of climate change in the National Park.

The Community Renewable Energy Project (CREP) started in 2004. It was supported by Yorkshire Forward and the NPA. With European funding, the project has had a £778,000 project fund.

At the start of the CREP, the focus was on:

- Working with 4 communities to develop community-led renewable energy projects,
- Assist other groups and businesses,
- Education and awareness raising,
- Capacity building and community empowerment including identifying and supporting Energy Champions and starting Energy Groups,
- Developing tool for communities to lead projects.

From the CREP, the following projects have emerged:

- Esk Hydro Power,
- Appleton-le-Moors Grant Scheme and Wood Fuel Initiative,

- Bransdale Wood fuel Project.

The CREP outputs are:

- Finished at the end of June 2010,
- Dissemination through the Sunflower Project,
 - Assessing different methodologies and approaches,
 - Learning points,
 - Developing a package for others,
- Save 2,000 tonnes of carbon dioxide per year,
- Community companies,
- Energy champions,
- Training of champions.

The lessons learned from the project include:

- There is a large amount of untapped energy available,
- Community development takes time,
- Studies and assessments take time and money,
- Community champions are needed at the heart of any project - community focus and community-led is key,
- Community scale renewables are not always easy,
- Funding is limited and difficult to organise,
- Regulatory authorities must be engaged at the start,
- Energy efficiency is cheap and effective (Energy Saving Trust website),
- There are lots of things we can do and are doing!

Questions and Answers

Q: Bureaucratic head-aches take a long time e.g. Environment Agency licensing for hydro projects.

A: Agencies do not have a transparent approach. Issues include state-aid rules and VAT. There is poor public information available and it can be contradictory. It can be difficult to approach and deal with these authorities. Work is needed to make things clearer and get rid of the grey areas.

Q: In Portugal, the state aid and VAT has been reduced for renewable energy technologies. There is an opportunity for energy efficiency. Based on human behaviour and the cheap option, what kind of approach has the NP adopted on energy efficiency?

A: It is easy to focus on renewable energy technologies. Time has been spent educating people on energy efficiency. The Energy Groups have facilitated this too. There is a need to focus on hard-to-heat homes although no funding is available for such buildings and energy efficiency measures.

10. “Sunflower Partner Projects Presentations” by various presenters

“Sunflower Partner Project Presentation for Portugal” by Peter Jones, NYMNPA

Due to the absence of the Portuguese Partner due to illness, Peter gave a short presentation on the Portuguese element of the Sunflower Project. The focus of work in Portugal has been to secure private investment in solar PV, look for a site to develop a solar PV power station and address socio-economic problems in the area. A

49MW PV plant has been installed. The site is a rural location and animals graze around the solar trackers.

The outcomes of the Portuguese work include:

- Running training sessions for students including 8 students from the UK,
- Production of “A Guide to Create a Start-up Company in Renewable Energy Sources” which will be available on the Sunflower website,
- Development of useful tools, also available on the Sunflower website at www.sunflowerproject.eu

“Sunflower Partner Project Presentation for Sliven in Bulgaria”

Sliven is 300km east of Sofia (capital) and is near a port and the Greek and Turkish borders. It covers 1,366 km² and comprises of 49 settlements. With the region, the Local Authority employs 350 people. Sliven has a population of 120,000 in the city. The population is ethnically diverse including Bulgarian, Turkish, Romanian and Greek. The economy is based upon agriculture, industry and services. As Sliven is close to Greek and Turkish markets and the Black Sea resorts, it is rich in biodiversity, transport and industrial infrastructure and cultural heritage.

There are two main forms of sustainable energy generation in Sliven:

- Wind power - The wind is called “bora” and is used for electricity generation. There is a Bulgarian Association of Wind Energy,
- Water power is also used to generate electricity as there are three rivers in the city.

“Sunflower Partner Project Presentation for EIGS in La Rochelle, France” by André Martinez

The focus of the School of Engineering (private ownership) is education, research and professional training.

EIGSI has 4 research themes and 2 application domains:

- Research themes
 - Energy storage
 - Logistics and organisation
 - Coastal protection including booms to minimise the effects of oil spills
 - Renewable energy
- Application domains
 - Transport
 - Environment

The Renewable Energy Team began in 2000 and focussed their activities on energy production, energy efficiency and small-scale wind and PV. The team have worked hard to improve the production of components. Other activities include the Sunflower Project, R&D in wave energy in Scotland and Tenerife, and the integration of small-scale wind turbines in urban areas.

11. “Electric Network Issues (grid connections)” by Ian Miller, CE Electric

Ian Miller began by emphasizing the importance of energy efficiency. He gave a concise overview of the history of the existing electric network in the UK, in general,

and the National Park, in particular. In essence, there are no technical problems connecting distributed generation. However, the solutions adopted now may cause problems later.

100-500 MW schemes need to work with NGET whereas the District Network Operator (DNO) deals with schemes less than 500MW.

Specific issues include electrical issues and contextual issues.

Questions and Answers

Q: What are the main considerations for renewable energy connections?

A: Loss and mains protection innovation is needed. For single schemes with multiple connections e.g. PV on roofs where one company installs panels on 30 households or 30 households join forces to install PV, it needs to be made clear exactly who is putting it in. Also need to comply with G83 and G57. It is important to establish if the building has a single or 3 phase electricity connection as you cannot connect one to the other.

Q: How do you manage voltage and small-scale renewable energy generation?

A: You must comply with the electrical regulations (G83). Some PV and wind turbines will trip the system.

Q: How are such problems dealt with in other countries e.g. Germany?

A. I'm afraid I don't know.

12. “Low Carbon Living in a Protected Landscape: Renewable Lowna” by Ruth Wass who converted an old waterwheel into a hydro turbine in the heart of the National Park

Ruth Wass began her talk by giving an insight into Ruth's family history. Ruth's family has lived in Lowna since 1790. Seventeen years ago, they converted a cottage (former calf house) into a holiday cottage. The conversion included energy efficiency improvements. They also tried to get planning permission for a second cottage. Around 10 years ago, the National Park policy changed to look at socio-economic benefits and the family applied to convert another cottage in 2002. Although the conversion is heated using oil-fired heating, it was renovated to high energy efficiency standards.

In 2006, Ruth and her husband had to decide whether or not to live in the farmhouse or let it. They decided to undertake a major renovation project and converted the farmhouse into their home. Again, significant energy efficiency improvements were made to the building. The building used to contain an old water wheel (milling and tannery) which had sunk in the 1950s and was removed in the 1960s. The wheel was recycled. The infrastructure including millrace and sluices remained in place.

It had long since been the dream of Ruth's husband to restore the waterwheel. They looked into the benefit of restoration as electricity bills were increasing and they wished to convert the farmhouse into a holiday home or family home. When Ruth and her husband learned about the National Park's SDF, they decided to apply for feasibility study funding in 2006. They were awarded £1,000 for 2 small feasibility

studies by Manpower Consulting Ltd and Derwent Hydro Ltd. The second detailed feasibility study was carried out by Manpower Consulting Ltd and was also funded by the SDF.

Essential work was carried out to obtain planning permission, licences from the Environment Agency, flood defence consent, fisheries and details on how to re-instate the wheel. The project was awarded a 50% grant from the SDF for £16,515 in January 2008.

Local quotes were obtained and the wheel was made by TWS. The wheel was built in situ in 2009. It was running by May and commissioned in June 2009 (powering an electric generator). A meter was installed to measure how much electricity is generated, how much electricity is exported to the grid, and how much electricity is being consumed on site. If connection to the National grid is broken, the electricity powers emergency heaters.

In the first 3 months, 3,598 kW of electricity was generated.

In April 2009, the Good Energy Company paid the Wass household 15p/kWh. In April 2010, 10,800 kWh was generated resulting in a payment of £1,600. From April to October 2010, the hydro system generated 9,000 kWh. This resulted in a payment of £1,800 for the 6 month period from FITs. Summer 2010 was very dry and the river level dropped. At 0.2 kW/hour, the wheel stopped generating for 3-4 weeks. The capacity is 3.5 kW/hour.

Overall, the project wouldn't have happened without the SDF. The waterwheel is visited by local group tours and school children. Visitors to the farmhouse and holiday homes like to see the waterwheel. The Wass family continues to do their bit by spreading the word and recycling.

13. "Two Local Community Initiatives in the National Park" by Colin Mather, Chairman of Esk Energy and Dave Rawlings, Chairman of Appleton and Spaunton Community Interest Company

"Appleton and Spaunton Community Energy Group" by Dave Rawlings

Dave Rawlings began his presentation by locating Appleton-le-Moors and Spaunton on a map of the National Park. The village of Appleton-le-Moors is just within the National Park on the southern boundary.

The Energy Group formed in 2004. Nelly Trevelyan was their first Community Champion. At the beginning, the group focused on:

- Information gathering,
- Understanding and learning about renewable energy and energy efficiency,
- Working towards the goal of reducing their community's carbon footprint by investigating options including:
 - Wind power
 - Biomass heating
 - Energy efficiency

Energy efficiency training was provided by Ryedale District Council. Following the training, an assessment of each property was undertaken to identify opportunities for improvements. Open days were held to disseminate and share information and giveaways.

The first renewable energy project under consideration by the group was a community wind turbine. A feasibility study was conducted in 2006. The study suggested the following:

- 225 kW wind turbine (second hand),
- 450,000 kWh would be generated which would offset the electricity consumption of the village,
- £120,000 installed cost
- £30,000 income per year (Renewable Obligation certificates)

The pros and cons associated with a community owned wind turbine were investigated by the study. A favoured site for a Vestas 225 kW turbine was on edge of village (reduced visibility) near to the existing Spaunton quarry (3 phase electricity supply).

The obstacles facing such a project included:

- Planning consent and lack of precedent for a community wind turbine in the National Park, and
- Local opposition!

The majority of residents who had not expressed an interest in the project formed an opposition group and voted 2:1 against the proposal. This project has stopped for now.

The second renewable energy initiative explored by the group was biomass district heating. In 2007, a feasibility study was conducted to replace the oil-fired heating systems within each building with a 1,000 kW biomass boiler and district heating scheme. Due to the difficult ground conditions, the scheme was likely to cost £2 million plus £1.4 million for the necessary heat infrastructure including pipework. At current oil prices, this scheme was unviable.

One positive outcome from the biomass investigation was the consideration of domestic-scale biomass (as recommended by the feasibility study). A renewable energy grant was obtained from the NPA to support renewable energy installations and energy efficiency in households. The grant paid for insulation improvements and around 30 wood burning stoves. This resulted in the demand for firewood exceeding supply.

To meet the local demand for wood fuel, the Energy Group entered into a wood fuel initiative with Mrs. Ann Procope of Skipster Hagg Farm who owns Bishop Hagg Wood. With Ann keen to manage the woodland and the new local demand for wood fuel, 13 ha of woodland are now managed by Community Volunteers. The woodland has been opened up and a new footpath joining 2 existing paths has been created. There is a conservation aspect to the woodland management as well as a wood fuel aspect.

The intention is to generate 50 tonnes per year of wood fuel for the village. From cutting the wood to selling it, the wood will be seasoned for a year. The Appleton and

Spaunton Community Interest Company (CIC) (formed to manage energy initiatives within the villages) will supply the firewood. A Woodland Management Plan and Business Plan have been developed. In the future, it is hoped that there will be opportunities for re-planting and a barn renovation.

A number of key lessons have been learnt over the last few years:

- Community groups need accessible information and advice,
- It is important to build on what other people have done and seek advice on what you can do,
- Community engagement is critical,
- It takes longer than you expect!

Discussion points:

- *The answer is to be completely open. Whilst climate change is important to the Energy Group, the community does not feel that climate change is a problem,*
- *Cumbria Community Trust - NIMBY's are a problem (not in my back yard). With oil-heating, you can have 75 people in a buyer group. When a community wind turbine option was proposed, the leader of the group wanted a wind turbine but did not want to see it. The project was dead in the water.*

“Esk Valley Community Energy Group” by Colin Mather

Established in 2004, the group were called the “Upper Esk Community Energy Group,” then the “Esk Valley Community Energy Group,” and now “Esk Energy Industrial and Provident Society.”

The aim of the group is to reduce the carbon footprint of a population of 1.500 people in the Esk Valley. The group is very active and has had the continued support of the National Park.

The quality of dependable information at that time was poor. In response to this, the Energy Group organized the following activities within the community:

- Energy fairs to disseminate and share information,
- Energy conservation drop-in sessions,
- Published a monthly newsletter covering issues such as insulation and available grants,
- Presentation and films to audiences of 60-100 people,
- Developed a website at www.eskvalleyenergy.org.uk

In 2005, an energy survey was conducted by the group which had a 50% return rate for questionnaires due to their personal touch (hand delivery and collection of questionnaires). The group also went on study tours to renewable energy projects and the Centre for Alternative Technology in Wales.

In 2009, follow up energy surveys were conducted. The group gave individual energy advice by telephone and found that 30% of people had already improved their homes. Following the telephone calls and guidance, more people acted on the advice.

In addition to energy conservation and energy efficiency, the Energy Group sought to provide information and advice on renewable energy technologies to the community. So far, this has included:

- The involvement of a local farmer who installed a wind turbine. The farmer now advises people on local electricity generation,
- As renewable energy needs to be included right at the start of any project i.e. in the design phase, the Energy Group provided renewable energy advice to new building projects including Abbeyfields and social housing developments,

The group has also investigated a number of community renewable energy projects including:

- Community wind co-operative proposal - a survey was conducted to find suitable locations and consult the NPA on such an initiative,
- Hydro projects - a feasibility study identified potential sites and assessed their viability. This included initial consultation with the Environment Agency. The study identified a number of existing weirs with suitable heads. The first project to emerge from this study is **Ruswarp Hydro Project**.

At Ruswarp, a fish ladder is already at the site. As the fish need to find the ladder, the turbine will be located next to the ladder. It has been a long process to obtain landowner agreement, planning permission, Environment Agency licences etc. Now, the money needs to be secured for the project to go forward.

- Low carbon home renovation - starting with the renovation of a Victoria property by a member of the Energy Group. This includes solar PV panels in a field (3.7 kW, 20 panels), a heat pump and solar thermal hot water heating. There have also been articles in Valley News (a local publication) about the renovation project,

The lessons learned by the Energy Group include:

- There is a need for good advice on the financial and legal side of renewable energy projects,
- You need to carefully consider the legal structure of the organisation (Esk Energy are now looking to become a charity),
- Plan finance in advance to avoid disappointment,
- Try and make sure that your group is full of enthusiastic people with useful/relevant expertise if possible,
- Remember your objectives and avoid getting diverted,
- Don't be just a talking shop (this is useful). Make meetings useful,
- Remember that the interests of people in the group may vary,
- Allocate responsibilities per project or task. If no-one will champion it, shelve it,
- Be ambitious but not too ambitious,
- Continued support from the National Park has been central to the group's success.

Discussion points

- *Peter Woods from the Energy Group emphasized the importance of the help from the National Park. He also said that the CREP Officers had trained National Park Committee Members in renewable energy technologies and energy efficiency measures. Peter also recognized the sustainable energy expertise and experience within Botton Village and their continued work together to share experiences,*
- *Martin Phillips from the Renewable Energy Trust said that the heritage trust was a Charity and Howsham Mill operates as a company.*

14. Closing remarks by Richard Gunton, NYMNPA

Richard Gunton began by saying that it has been an interesting journey from approaching Yorkshire Forward at the start of the project to the conference today. Overall, the project has resulted in the National Park having a smaller carbon footprint than in 2004. Richard told delegates that we are all here because we have to do this and we want to do this. Although community-led energy initiatives can be a daunting task, there is hope. The Government is becoming greener although there is still the need for lobbying. Lessons have been learned. The real task is to change lifestyles and the way we live.

If £700,000 funding was obtained at the beginning of the project, we may not be here today. However, Richard recognized the important of community-led projects. At the beginning, Yorkshire Forward's aim was to get the entire project completed in a year. And here we are, six years later...

Richard thanked everyone for attending the conference and wished delegates a safe journey home.