

RENEWABLE ENERGY AT SHEEPDROVE ORGANIC FARM (Phase One)
DEVELOPING BEST PRACTICE IN THE NORTH WESSEX DOWNS AONB
Supported by the North Wessex Downs AONB through their Sustainable Development Fund.



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June 2006

The case study has culminated in three documents:

- **Sheepdrove Organic Farm's Perspective.** This short report explains the origins of the case study and examines the farm's experience of the project.
- **The Final Report by LDA Design.** A report by the independent consultants that documents the process of the case study and its findings.
- **Report Appendices.** These contain materials used in the workshops, outcomes such as the Constraints Map, and the feedback recorded from stakeholders.



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Sustainable Business Awards for the South East 2006
Winner - medium sized business

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Sheepdrove Organic Farm's Perspective
Jason Ball, Manager of Biodiversity and Alternative Energy
Sheepdrove Organic Farm

Foreword

This report by Sheepdrove Organic Farm discusses the experience of this case study. It was produced separately from the case study authored by LDA Design, and therefore it does not necessarily reflect the views or findings of the independent consultant team.

Acknowledgements

Our sincere thanks go to everyone who took part in this project, including all stakeholders, and the team of independent consultants; LDA Design, Alison Millward Associates and Future Energy Solutions (FES). Our understanding of sustainable energy use also benefited from other consultants that we worked with during the same period, including Forum for the Future who helped to establish this project, Dr Chris Weedon, and Prime Energy Ltd.

We are especially grateful to the North Wessex Downs Area of Outstanding Natural Beauty, who provided the major project finance through their Sustainable Development Fund and who also worked with us so supportively to ensure the project's success.

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1. Project Origins

In order to become more self-sufficient in energy provision, manage costs to our business, reduce our carbon footprint, and use more renewable sources of energy, Sheepdrove Organic Farm has been investigating energy for some time. We see this as part of our continuous efforts to improve sustainability.

The farm has already established several initiatives in alternative energy, such as with solar heating; solar photovoltaics; combined wind and solar units to power an automatic gate; heat exchangers; and vehicles powered by electricity, hybrid power, or LPG autogas.

During 2005 we worked with Jonathon Porritt's team at Forum for the Future, who investigated a range of renewable options and their suitability for the farm. During the process we identified the need to evaluate the implications for wind energy located at the farm, being on the Berkshire Downs at the heart of the North Wessex Downs AONB.

We saw the potential for a case study that would look at a scale to suit the farm's needs, and would go further than the recent North Wessex Downs AONB wind turbine sensitivity study, (the NWD AONB wind study) in that it would explore how to go about considering wind power development from the perspective of our business and its working community. We were fortunate to secure support from the North Wessex Downs AONB for this project.

We consulted closely with the AONB team to ensure that the project would be relevant to AONB stakeholders and could produce a report that would be a tool for further policy development, as well as a process to aid awareness and understanding for the farm and for the wider AONB community.

2. Our Experience of the Case Study Process

Here we discuss only selected aspects of the study, which is fully documented in the LDA report.

Having the Community Engagement happening at the same time as a wider discovery process - with experts such as FES and LDA Design providing crucial facts and evaluations - was a synergistic approach, although challenging. We took on board varied types of information plus a range of opinions at the same time, which fed into the development of our ideas about wind power and other forms of renewable energy.

It was very valuable to hold a stakeholder dialogue at such early stages, as we did, because it enabled key issues to be explored early, which all informed our thinking and planning. We used the Southwest Public Engagement Protocol¹ to guide our consultation approach (discussed by LDA Design later).

Being open and transparent with the project was the right way to do things, not least because it brought benefits to the case study process. Our well-established core values and the farm's track record on meaningful efforts to improve sustainability were strong foundations in this respect, as was the employ of independent consultants. Any inconsistencies or attempt to deceive people would surely have been identified and that would have ruined the project. However if this had been a part of a planning application process, openness would have been just as vital.

We worked with the independent consultants – benefiting especially from the experience of Alison Millward Associates - to ensure that the workshops were an opportunity for stakeholders to express their concerns and pose any questions. This was crucial to the value of the case study. Our facilitators' notes guided us and we all discussed important points before the workshops started and afterwards. Everyone in the team tried to respond without judgement to concerns that were raised. We also allowed comments to be made without attempting to correct them because it was more important that all views were expressed and then recorded.

Some difficulties were generated by the inexperience of the business – this being the first such study we have done – and by the time frame in which we had to engage with the community, obtain expert opinions and develop our thinking on wind energy.

Short timescales meant that often during the workshops we found out items of information at the same time as the delegates attending the meeting. For instance, we did not have the opportunity to preview the hypothetical scenarios (Appendix 12) before they were presented at Workshop 2. In some ways it was fair to have everyone judging the evidence at the same time with no chance for a rehearsed response or statement.

However, if we were to go through this process again, it would be preferable to spend time making draft versions of presentation material; not for the sake of biasing presentations (although there is a danger of that) but in order to prepare information in ways that best support understanding. If this had not been a case study consultation would probably also have begun with more clearly defined targets, etc.

One thing above all that came out of the case study process was the potential for misinterpretation. Careful preparation of the presentation materials is crucial to reducing

¹ Capener, P and Cowlin, C (2004), *South West Public Engagement Protocol and Guidance for Wind Energy*. Regen SW.

this factor; and although sometimes difficult, it is important to anticipate how information might be seen differently from a critical or negative perspective.

Examples of misunderstanding during our case study include:

- Stars indicating 'hot spots' on a wind resource map by FES were misinterpreted as being sites that the farm had chosen for turbines. This was linked to the difficulty some people had in believing that the case study preceded any site selection.
- A map illustrating a ZVI (Zone of Visual Influence) for a hypothetical location of a Gazelle turbine near the Red Barn (at a high point on the farm) was shown to farm staff at a meeting to help them understand the issue of visual impact and the high sensitivity of the open downland landscape. However it later became apparent that this map had been misinterpreted as if the Red Barn was a chosen turbine location. This idea was discounted during Workshop 1 on the farm tour.
- Some delegates at Workshop 1 began to believe that the tallest turbines discussed must be what the farm was aiming to install. We were only using this range of sizes to make sure the case study properly examined the possible combinations capable of meeting 100% of electricity demand. However some people suspected that these ideas were not really hypothetical.
- Discussing the scenarios that would meet 100% of electricity demand at the same time as announcing a 25% target for renewable energy was confusing. The confusion was increased because the photomontages did not always portray the proper numbers that a 100% target required. (Workshop 2.)

In any future discussions we would change the way we present information, especially visual material, and make a concerted effort to make things more focussed and concise.

We anticipated some mistrust and that some people would 'expect the worst' when we mentioned an interest in wind energy. That is why we continually stated in all our communications that we were not interested in wind for the sake of profit and that we did not want a wind-farm. To reinforce this message we put onto every table at the workshops a large image of a wind-farm with a red cross drawn over it with the phrase "Not what Sheepdrove wants" which we also posted on our website. Despite this there were still instances of people saying that we *were* aiming for a wind farm (to the media, etc) that our intention was profit, and that indeed we already had plans or proposals.

Predictably perhaps, it seemed that people who came to a meeting with entrenched opinions seemed more likely to disbelieve what they were presented with or make wrong assumptions, especially if based upon fears about the potential impact of development.

Understandably, we also found that those stakeholders who might believe they had the most to lose tended to mistrust information, or make a worst-case-scenario interpretation of the information provided. This is reflected in the workshop feedback.

The very rapid formation of an 'absolute no' opinion by some delegates, and the belief that the ultimate plan was to develop a commercial wind farm, led to the formation of an opposition group called FOLD (Friends of Lambourn Downs).

During the consultation process there were some things that worked very well and other things that did not work so well. For example, working with a large group of people in each workshop enabled discussion with a wide range of stakeholders, with varied

opinions, at the same time. However, it produced an environment that sometimes quelled free expression and there were those who did not seem able to say what they wanted to because of criticism from others. It was helpful to split people up randomly into facilitated small groups on different tables for detailed discussions.

Some of the stakeholders were very vocal with their opinions and while it was important to record this, a forthright view can often seem to be dominant and other people might not express themselves as readily if their opinions are moderate or different. This seemed to happen in some of the table-based group discussions. Later some stakeholders confirmed this to us verbally yet they did not say this during the workshop, so we feel sure that some opinion was lost.

The hypothetical nature of a case study like this presents some problems dealing with the issues involved, but this lack of specificity was necessary without known proposals.

It may have helped to use photomontages of hypothetical scenarios during a farm tour. Perhaps this would enable delegates to relate to the scale and context more effectively. We could also have improved presentation methods to support people's understanding about how to relate images and data tables to the 25% target. Easier-to-absorb amounts of information would have helped such as having smaller tables of selected data.

Heated questioning and debate at the tables during Workshop 2 meant that progress with questions and consideration of hypothetical scenarios did not develop as fully as we hoped. Most groups ran out of time before they could come to a natural end with discussions and so the full value of the table discussions was not realised.

However some people had begun suggesting alterations to the scenarios. This was an important step because stakeholders had moved their ideas beyond the more general suggestions for mitigating factors from Workshop 1 and they used the new images and available information to go further. For instance, for scenario 2, one comment recorded in the Workshop 2 summary notes was "Reduce number and find more productive location – e.g. 400m from ridge byway".

At the 'green table' some turbines in scenario 2 and scenario 3 were crossed out, and these reduced numbers became more acceptable to the group. So cumulative effect was important. Reductions were not possible for the single turbine in scenario 1. Scenario 4 was seen as very low impact by the green table overall and it was even suggested that the farm could "have as many of those as you like" although the low productivity and very restrictive economics were recognised.

The green table delegates started to see how certain scenarios could be focussed towards a 25% target and that this represented a reduced potential impact. Some of the people on this table not only said that one or two turbines from scenario 2 might be acceptable, two people even suggested that to harvest more wind energy, the farm ought to put those Entegri turbines higher on the slope. This was surprising because it meant possibly more visual impact, however it makes sense to ensure developments are as highly productive as possible within the constraints of the location.

The process of considering potential impact, how to reduce impact and ways of moving towards possible appropriate scenarios was one purpose of the case study after all. So it was very encouraging when participants clearly started to propose such ideas and encapsulate this process.

Of course there are also those who did come to workshops and it is clear from a lack of response by most non-attendees that letters, briefing papers and emails do not seem to encourage much feedback. So the workshops were very valuable as a forum for communication.

Participative engagement reaches certain limits if some stakeholders do not agree with the purpose of the project, or the value of the dialogue process or a particular exercise. Problems were found when persons who felt strongly 'anti' refused to engage in exercises that they considered were all about compromise. This idea obstructed their openness to proper debate of the full range of issues.

It is somewhat frustrating to be met with absolute 'no' to any size of wind energy but of course it is as valid a view as unconditional agreement – neither of these really allow a balanced exploration of the issues. However overall we found a range of views that were, in practice, open to debate and the workshops were essential to the community engagement.

Perhaps unfortunately the staff from Sheepdrove Organic Farm who attended Workshop 2 mainly abstained from expressing themselves. While it is a credit to them for trying not to bias the case study or inhibit the self-expression of others, it might indicate that they did not consider themselves equal to other stakeholders and therefore able to comment with the same validity.

This is a lost opportunity when the working community are actually important stakeholders. We can learn from this and recommend that active participation from staff and especially resident staff should be strongly encouraged. After all it was shown in the informal farm meeting on 14th February 2006 that concerns and ideas held by the staff were similar to those of many other stakeholders.

We met with opposing views and very different perceptions but we also found supportive and constructively critical feedback. There was also some very valuable relevant knowledge among the stakeholders and correspondingly it seemed to be a learning experience for many of them also.

We received several messages of support from nearby neighbours who did not wish to express their views in person, for instance a letter of support that was not read out in Workshop 2 because of lack of time. This goes to show that other ways of getting people's opinion might have been valuable.

We also had a number of people approach our staff during a farm Open Day event on Sunday 12th March who expressed interest and support for wind energy at the farm. This positive feedback from the public was despite a protest by FOLD taking place that day leafleting visitors and showing opposition to any possible future proposals. Earlier that week there had also been inaccurate statements made by some members of FOLD in the local media.

Even though the workshops have been done, we welcome communication with any stakeholders and responses to this case study. We also continue to invite feedback on our web pages dedicated to the topic of energy, found in the Conservation strand of our website. (www.sheepdrove.com)

3. Wind Energy in the Context of the North Wessex Downs AONB

This case study has been a learning process for the business and it has benefited us to immerse ourselves in a case study that brought together our interests, community concerns, and sources of expertise. The project brought out many issues that we had to consider such as:

- costs and the cost-effectiveness of some different turbine sizes or combinations
- no grid connection means that electricity is wasted
- installation costs increase with distance away from local grid connection
- grid connection requires cooperation from electricity companies and will require control units
- wind turbine designs and the fact that they have limited tower height options
- some turbines need inverters and some do not
- our local wind resource and its variation with landform
- effective location of turbines in areas of sufficient average wind speeds
- larger turbine blades capture more wind
- how increasing height provides a vastly larger wind power resource
- how intrusive the turbulence and shelter effect is from buildings and woodland
- our young tree plantations will affect future suitability of many locations
- landscape character and sensitivities specific to the farm
- zones of visual influence in relation to our landscape
- cumulative impact (from higher numbers of turbines) is an important factor
- buffer distances needed to reduce sound and visual effects
- clearance distances needed for byways and bridleways

With the help of AONB stakeholders and expert consultants, we have identified a whole set of constraints that clearly show where some parts of the farm are not appropriate for turbine location. So this is an example of how to limit wind energy developments. This project demonstrates how to steer away from potentially harmful precedents from the earliest stages so that they do not become established.

In other words, identifying constraints and properly considering the North Wessex Downs AONB setting, localised landscape context and stakeholder needs helps to protect against harmful precedent by indicating clear limits to development.

Creating a map of constraints and the wind resource together was a very helpful process. The Constraints Map not only shows things that need to be protected or avoided, but also the wind resource is shown too. This is perhaps the most concise way to distill and illustrate some of the key expert knowledge and the issues raised by stakeholders.

Beyond the findings of this case study, those of the 2005 NWD AONB wind study also have to be considered as part of the farm's exploration of constraints. We have learned from the guidance in their report, and have tried to apply the findings to our farm's landscape in a way that helps us understand the constraints.

The 2005 NWD AONB wind study states (page 47) that even turbines shorter than 25 metres are likely to be similarly constrained to Height Class 1 "unless they are of a small scale and integrated with existing built structures" and says that individual site investigations would be needed to assess specific sensitivities and constraints.

Taken from the NWD AONB wind study, we made a list of the key elements that we considered most relevant to Sheepdrove Organic Farm and the Lambourn Downs:

- remoteness
- tranquillity
- absence of enclosing elements
- expansive, uninterrupted 'natural' views
- classic chalk landform with rolling summits and ridges
- open ridges, skylines and successive horizons (relates also to 'd')
- historic features
- 'empty', undeveloped character
- sparse settlement
- general absence of built structures
- chalk grassland and the opportunities to reinstate or link sites
- recreational opportunities

The 2005 NWD AONB wind study used the above characteristics to assess sensitivity and in effect these features become the *constraints* with regard to landscape. The 'user guide' part of their report gives guidance on the meaning of constraints and these underpin the evaluation of the open downland as *highly constrained*.

Therefore any development should avoid significant, adverse change in these aspects of landscape character. In section 6.3 of the Sheepdrove case study report, LDA examines possible measures to ensure landscape character is not damaged. We can use this to guide future thinking.



Viewing the turbine at Facombe

4. Answers to Concerns

The table below contains many concerns that were raised during the process of community engagement, and also examples of the typical concerns about wind energy developments. We have offered responses to these points.

Stakeholder concern	Response
Any wind turbines – even well placed and small scale - will set a precedent that leads eventually to harmful levels of development by unscrupulous companies.	We do not believe that planning policy would allow the North Wessex Downs AONB to be ruined by insensitive growth of wind energy in this way. There is clear policy to protect the character of the AONB. We hope that constraints mapping, as used in this case study, should help set a positive precedent, because this helps to identify and set local limits to development.
Massive wind farms designed to make profit will develop from single turbine installations	For the reasons above, we do not expect this would be allowed to happen in the North Wessex Downs AONB. Limits will have been identified during constraints mapping and stakeholder consultation. Policy judges the purpose of profit differently to self-sufficiency reasons for wind energy.
More turbines will be allowed as the electricity demand of a business goes up	Constraints mapping will help to set limits upon future capacity based on the sensitivities identified at the site. This can be more specifically limited by the local authority, who would take guidance from the North Wessex Downs AONB. Increased impact can be avoided by careful future re-commissioning, and technological improvements might enable similar turbine sizes and combinations to achieve better productivity in future.
Noise will always be an issue that is not properly controlled because variable wind carries sound across the open landscape of the Lambourn Downs.	Noise will be an issue with any form of energy generation. This ought to be considered on a case-by-case basis as with any planning proposals. Landform, wind direction and nearness of ‘receptors’ need to be considered. Modern designs tend to be quieter than the older models that gave wind energy a bad reputation for noise.
I have heard that low frequency sound might affect health.	Once again our map of constraints shows that we would minimise any possible risk of negative effects by avoiding residential property and rights of way by a long distance.
Horses will be scared by the sight and noise.	The Constraints Map shows that we have respected the guidelines of the British Horse Society regarding this issue. We would also avoid causing an element of ‘surprise’ in the way we locate any turbine.

<p>Shadow and shadow flicker are visual effects that will move across the landscape with the position of the sun, changing seasonally as well as daily.</p>	<p>We expect that this effect is likely to be very small due to the size limits and overall cumulative limits that AONB planning guidance would impose on possible wind energy installations. This effect is most relevant to residences, and impact could be avoided with buffer zones.</p>
<p>Biodiversity will suffer, especially wild birds.</p>	<p>This would be evaluated as part of an Environmental Impact Assessment. It can be avoided or mitigated for according to the local authority conditions in response to the EIA, and advice can be sought from experts. We can call upon the knowledge of bird experts including the local RSPB Farmland Bird Officer.</p>
<p>Turbines do not belong here because the Lambourn Downs is a natural landscape.</p>	<p>Because of the influence of humans, the Lambourn Downs countryside cannot be classified as 'natural'. The area is, in fact, a product of thousands of years of human impact upon the natural habitats that developed after the last 'ice age' - especially deforestation and agricultural activity. Every field, drove and hedge has been shaped by people and the removal of woodland created the openness of the Lambourn Downs.</p>
<p>A wind turbine would become a tourist attraction, which is undesirable.</p>	<p>We do not expect that the scale and location that might be allowed on the Lambourn Downs is in itself likely to attract many visitors.</p>
<p>The infrastructure such as maintenance tracks and substations will be an eyesore and will threaten yet more habitat and archaeology.</p>	<p>Until there is a defined proposal then the specifics of the installation cannot be known. However, Sheepdrove Organic Farm aims to minimise visible infrastructure to any possible wind energy developments in future, as part of minimising overall visual intrusion.</p> <p>These factors would all be evaluated as part of an Environmental Impact Assessment. The size of turbines likely to be allowed within an AONB landscape is small and the cumulative numbers also limited – and this will in turn make roads and other structures either small scale or unnecessary.</p>
<p>Maintenance visits will create traffic to the site.</p>	<p>Because any wind energy development on the Lambourn Downs is likely be of a small size and in limited numbers the traffic is not expected to be on a scale comparable to a commercial wind-farm. We would also aim to be self-sufficient in maintenance for any possible future installation.</p>
<p>Turbines will interfere with communication signals.</p>	<p>This possibility is assessed before any development is allowed.</p>

<p>Why is the farm focussing on wind energy?</p>	<p>Beyond the aforementioned renewable energy already in place, the farm is actually looking into a range of new solutions and wind energy is a feasible and clean way of generating electricity. Towards meeting other types of energy demands (heat and transport or machine power) we began a trial here with anaerobic digestion to produce methane (soon after Workshop 2) and we have now ordered our first delivery of bio-diesel.</p>
<p>Even for wind energy on a small scale, all the benefit would be for the farm and yet the detrimental effects on the AONB are felt by everyone.</p>	<p>Because we would allow excess electricity to flow into the local electricity network then even microgeneration scale could help to boost local supplies of electricity. Any electricity we can generate ourselves will also reduce our demands on the local power supply.</p> <p>As the potential for negative effects is so high in the Berkshire Downs we are considering the implications very seriously. This is one of the reasons why we carried out this study and it has helped to identify the range of possible effects on the landscape, its heritage, biodiversity and for those who enjoy it. We value the countryside that we work with and see it as vital to the business.</p>
<p>What is the value of local power generation? Electricity is easy to obtain and easily moved across the country.</p>	<p>Actually lots of power is lost because of the way it is carried across the UK mainly from a small number of massive generators.²</p> <p>Local generation of electricity helps the area where it is made and boosts supplies. This adds stability and efficiency and is very useful in rural areas where supply can be much less reliable than urban areas. Sheepdrove Organic Farm sometimes suffers power cuts and wind energy, although intermittent, could be helpful in securing its supply of electricity.</p>
<p>Why not just buy land outside the North Wessex Downs AONB and put wind power there?</p>	<p>Doing so may not fit so well with the principles of self-sufficiency and the sustainable benefits of locally produced energy. There is an argument for generating some energy where the core business demand is based, without imposing upon other areas, and by developing sensitively to meet the capacity of the farm's own land. We also believe that we can successfully fit wind energy into the local countryside without harm to its intrinsic character.</p>

² From an article entitled "Incredible journey" by Stephen Tindale, 15th March 2006, in *The Guardian* newspaper. ("In total, the energy wasted at the power station and on the wires is equal to the entire water and space heating demands of all buildings in the UK - industrial, commercial, public and domestic.")

Why not just buy your electricity from a renewable energy provider?

The farm would like to buy electricity from a renewable energy provider, which will help us to reduce our carbon footprint further, yet this will not make us more self-sufficient. So far the top suppliers of 'green' electricity are not able to take us on as a customer because they cannot meet our needs.

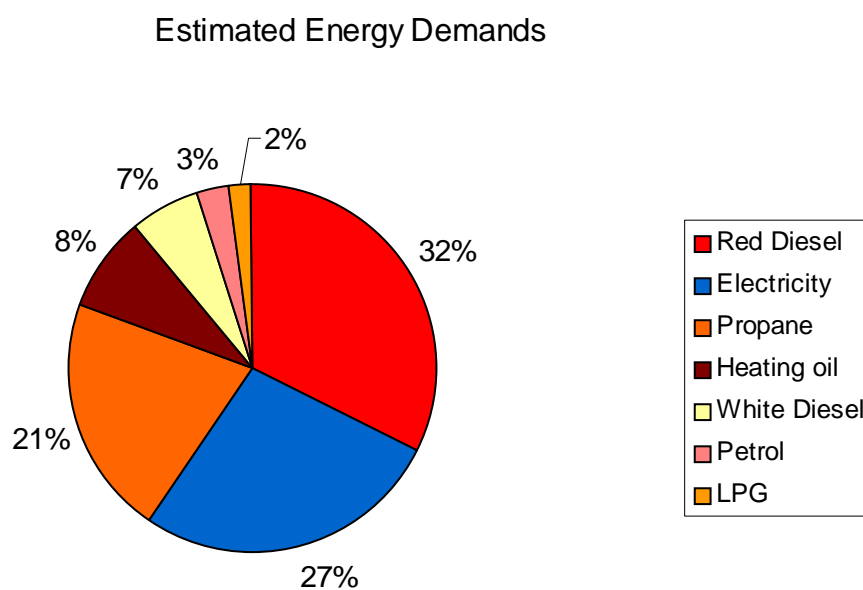
5. Alternative Energy to Suit the Farm

When this case study began Sheepdrove Organic Farm already used solar heating at The Kindersley Centre, solar photovoltaics to charge batteries for chicken feeders and electric fences, and heat exchangers at The Kindersley Centre kitchen. More recently we have also installed a combined micro wind and solar unit to power an automated farm gate, we ordered our first batch of bio-diesel, and we are trialling anaerobic digestion.

The farm sees further potential in several forms of renewable energy. Just as this project was beginning, Sheepdrove Organic Farm was gathering ideas from a research report for by Forum for the Future³ that looked into the feasibility of different options.

Expert guidance from Jonathan Whittall at Forum for the Future helped us to prioritise a range of options, with regard to factors such as suitability to the farming and food production, how they meet our energy demands, matching local resources, economics, our location, and so on.

Forum also carried out a detailed study of our energy use. Our total energy usage (measured in kWh units) can be split into the following major uses: 32% red diesel (farm vehicles) 27% electricity, 21% propane heating, 8% heating oil and 7% white diesel.



Forum for the Future designated wind energy as 'high priority' among the many renewable energy options considered. Wind energy was highlighted by Forum because of the reduction it could make to our carbon footprint and because the local wind resource was expected to be favourable, this meant it had good potential for contributing significantly to our energy needs. They found that it has a promising economic feasibility (limited to some extent by local AONB constraints) compared to some other solutions.

Wind power has been used here in the past for pumping water and for generating electricity. Before the Kindersley family had access to mains electricity, they had a small windmill for generating power at the house during the 1970s. This was a 2kW generator

³ Forum for the Future (2005), *Sheepdrove Organic Farm: Reducing Energy Use and Maximising Renewable Energy Production*.

with a total height of around 30 feet (9m). Today it is gone but perhaps they ought to have kept it, especially in the light of rising electricity prices. The house often requires power back-up and currently a small diesel powered generator provides this.

Wind energy seems to be the renewable source most likely to cause a significant visual impact on the local countryside. However there are implications posed by other forms of energy production too. LDA have briefly examined this matter in the final report.

Other forms of energy production judged to be 'high priority' by Forum included:

- Heat recovery units for the poultry processing unit
- Solar PV (photovoltaic) panels to recharge batteries e.g. for electric fences
- Purchase of bio-fuel for transport

Each of these have been investigated further since the Forum report, and we have made progress specifically with bio-fuels, having ordered our first delivery of bio-diesel for our vehicles and we now have more solar PV panels for battery recharging. New heat recovery units have not been installed as yet, however we are looking into this seriously as something linked with a new anaerobic digester system.

Anaerobic digestion (AD) is now being trialed at the farm, and at the time of writing this report we hope to be able to design a proper installation that would deal with our wastes from the processing unit. This project is particularly exciting because of the other benefits it can bring to the farm. In addition to producing methane, which is a very useful fuel, the unit will deal with problematic wastes and will produce solids and liquids rich in nutrients that we can use on the farm – perhaps even enriching lagoons for sustainable fish production.

Now viable at small scale, anaerobic digestion might be a very good option for communities and farms across the North Wessex Downs AONB but there are issues such as the availability of material to digest, and the expense required to set up a system.

With regard to impact on the landscape character, this depends on scale, but AD units are usually designed to be low in height, and can even be buried into the ground to hide them and to insulate systems for better temperature control. AD systems could require several items of infrastructure, but these are closely associated with the digestors.

The farm also sees biomass as a great potential energy source for the farm, because with a CHP unit (Combined Heat and Power) we could generate heat and electricity too. We see this as primarily being a source of heat and power for the central farm buildings. Forum originally classified biomass CHP as 'medium priority' based on factors such as the difficulty of growing our own biomass crops and storing the harvest. However, we are currently planning to establish a plot of short-rotation coppice and success with this should improve the prospect of using this as a major renewable energy source here.

Another low-carbon source of heat are ground-source heat pumps, which we are interested in for the Kindersley Centre, which already has a solar heating system that reduces our fossil fuel use. These can be very small and low-profile, equivalent to air conditioning units, and piping to collect heat from the ground can be done with a borehole, which is less demanding on land area than networks of low depth piping.

Small-scale waste incineration plants may seem a visually unattractive idea but they could present a good opportunity to deal with local waste problems (just as the farm's composting operation did before being downsized) and it is a very reliable and economically viable source of heat and electricity. However a chimney might not be welcomed and depending upon location and size there could be a significant impact on the local landscape character. There are also the issues of air pollution, the physical footprint needed for an installation and the disturbance factor of waste deliveries.

Waste incineration has been considered but we have put it lower on our priorities than cleaner options like wind energy. A wind resource may be intermittent and unpredictable, but wind power here would be non-polluting and turbines would not require frequent deliveries of fuel to keep it going.

Oilseed rape poses a real prospect as a source of bio-fuel for the UK and many farmers are considering this purpose for the crop. However there are potential problems for biodiversity in the way the crop is grown, while organic methods do not give yields that are as good as chemically farmed rapeseed. Manufacture of artificial fertiliser used to grow the rapeseed, especially nitrates, is also very demanding of fossil fuels and effectively shrinks the reduction of carbon footprint from bio-diesel. There is also the problem of whether to process the oil at the farm (investment in machinery, storage units and new skills) or pay higher prices for pre-extracted oil (also has storage and delivery problems). Using waste vegetable oil also has high transport and processing costs. All bio-diesel sources are liable to fuel tax. Adding more bright yellow fields of oilseed rape to the Berkshire Downs is also an effect that might not be agreeable in terms of landscape effect, despite the fact that this might provide a reliable replacement of a large amount of fossil fuel diesel used at the farm.

In summary; there are several options available that can help to provide more sustainable energy use but when a community looks at all the feasibility factors and benefits, it is not easy to select one, because of the balance of pros and cons. The solution also has to suit the type of energy needed. Each technology offers some solution to an energy problem, yet each has its own range of challenges.

Energy efficiency is a major part of our work to achieve more sustainable energy use. The Kindersley Centre is an excellent example of energy-efficient design. We have begun an energy efficiency drive involving everyone in the business, and we have obtained materials to help staff to understand where we can save energy. Through the Carbon Trust, which offers funding to businesses, we recently commissioned an energy efficiency study from Prime Energy Ltd, who have given the farm several key recommendations for saving energy, and they also recommended wind energy and wood-powered heating.



LEFT: Our anaerobic digester trial. RIGHT: Monitoring and controlling heating to save energy.

6. Conclusion

The final report from LDA Design gives clear recommendations about renewable energy in the context of the North Wessex Downs AONB, in addition to a thorough documentation of the case study process. Our case study has raised awareness not just for the farm but also, it seems, for the many stakeholders involved. We hope that the project outcomes will be valuable to the wider AONB community as whole.

Sustainability is not a straightforward issue, and it means more than judging wind energy to be 'necessary and always good' which is as narrow a view as 'wind turbines in the AONB are bad' neither of which support truly progressive sustainability. We recognise that it is not justifiable to suggest that the AONB landscape and community should be harmfully compromised by wind power simply because it is environmentally friendly by definition. There is so much to consider within the concept of realising sustainable development. How do we achieve something that works from all angles?

This case study has helped to crystallise the issues in Sheepdrove Organic Farm's situation. We now have clearer guidance on constraints for a range of factors, in addition to those from the North Wessex Downs AONB wind study.

The idea that 'striking a balance' means that the landscape loses out to development, is not consistent with planning policies. So the farm must try to devise ways of fitting renewable energy into the landscape without compromising the key characteristics that make the area special. This is why key characteristics translate into constraints.

If we were to eventually devise a proposal, our learning process steers us toward wind energy installations that would be:

- carefully positioned to avoid harm to the landscape character
- likely to be associated with existing development or buildings
- away from the most prominent points on the farm
- using slope and land contours as the major way to reduce overall visibility
- located a suitable distance away from Public Rights of Way
- away from residential buildings and our nearest neighbours
- avoiding and minimising biodiversity impact (including disturbance)
- avoiding and minimising impact on archaeology and other cultural heritage
- keeping cumulative effect to a minimum
- keeping impact by infrastructure as small as possible
- small scale, even approaching 'microgeneration' scale

Microgeneration is defined as being less than 50kW electricity, or less than 45kW heat from a low-carbon source.⁴ It would seem appropriate that Sheepdrove Organic Farm would aim for the microgeneration scale for any possible future wind energy units.

⁴ Energy Act 2004. www.opsi.gov.uk/acts/acts2004/40020--g.htm#82

For heating we may need units rated above the microgeneration scale, e.g. providing warmth for chick nurseries or farm buildings. The farm could use technology such as CHP (combined heat and power), or relatively conventional technology such as hot water boilers but powered with renewable fuels.

Based on what we have learned, we believe that the farm could achieve a wind energy installation that both fits into our particular location within the North Wessex Downs AONB countryside, and that would also be of significant benefit to our energy management. The challenge now seems more tangible, and of course the limitations of potential wind energy installations are now clearer. However there is still much to do and a whole new process of consideration and consultation that the farm would have to go through to establish the framework for a possible future wind energy proposal.

To take this process forward we are continuing our stakeholder engagement, where we will maintain open communication with the community, and discuss the findings of this case study and the farm's evolving ideas regarding wind power and other forms of renewable energy. We particularly wish to engage with our local Parish Councillors and West Berkshire planning department to examine the context of where we are now and what the next steps might be.

Our ideal would be to develop proposals that are seen as a good example of mutually beneficial and sustainable development of which the North Wessex Downs AONB community and Sheepdrove Organic Farm can be proud.