

RENEWABLES

An eight-page **Farmers Guardian** special feature



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Uncertainty over Government subsidies and planning and financing constraints risk putting the brakes on the small-scale wind sector. **Olivia Midgley** gauges opinion from a selection of the industry's leading experts.

What does future hold for wind energy industry?

Progression in the UK farm-scale wind market has led it to be one of the strongest and most active in Europe. Worth more than £100 million to the rural economy, the market's status is supported not only by its activity, but also by its

maturity, with consolidated players operating at all levels of the value chain. But market growth continues to be threatened by a variety of hurdles, which will need to be surmounted if distributed wind generation is to fulfill its enormous potential in the UK. ▶



The UK's farm-scale wind market growth continues to be threatened by a variety of hurdles.



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Servicing and maintenance an essential component of turbine ownership

Christine Griffiths, of Aeolus Power, explains what you need to know.

The purchase of a wind turbine is a significant financial commitment and that investment needs to be well maintained to ensure it performs as it ought to for as long as expected.

In the same way a car requires regular servicing to remain in peak condition, the parts of a turbine wear and need replacing, greasing or adjusting to ensure their continued optimum performance.

Turbines are serviced and

maintained according to hours of operation or years since installation.

Parts which are regularly checked when the turbine is serviced include seals, oil levels, filters and brake pads. The turbine's working parts are greased, pads replaced and gel beads or lubricants added as required.

Each manufacturer will have a specified servicing schedule detailing what must be carried out by professional, trained servicing and maintenance engineers and at what frequency.

The manufacturer's warranty

will often be dependent upon the service and maintenance checks being carried out at the appropriate time, in the correct manner by suitably qualified engineers.

Reassurance

Ensuring compliance with a manufacturer's warranty provides reassurance should the turbine stop working unexpectedly as the repair work will be carried out cost effectively.

Regular maintenance and servicing of turbines is essential to ensure they remain in peak condition and reach their



Christine Griffiths

expected operational life. Annual maintenance costs should be added to the overall cost of the turbine.



Experts think wind energy presents a viable opportunity for farmers.

tariff reduction as something of a death spiral," adds Mr Arnus.

"At the current tariff level, the industry is still able to offer an attractive product to investors and landowners. Further cuts, however, may prove hard to

swallow and it is likely some consolidation will be necessary and we may see a process of natural selection, whereby only the strongest companies with the most efficient product will survive in the long run."



Ivo Arnus

These range from the ongoing impact of tariff degression and financing difficulties, to planning challenges and technological concerns such as how to address grid connection and long-term maintenance.

While landowners across the country continue to enjoy the financial benefits of becoming independent power producers, it is vital each of these areas is addressed in order to guarantee the sustained viability of farm-scale wind as a practical and profitable investment.

Ivo Arnus, director of UK business development at Norvento, says: "As a Feed-in Tariff (FiT) supported sector, the success of farm-scale wind has always been tied in to the status of external Governmental mechanisms.

Rate of growth

"While the development of the sector to date has been fuelled by favourable subsidy regimes, ongoing tariff degression as small and medium wind installations proliferate is, in turn,

starting to slow down the rate of growth."

The recent degression this October (a 10 per cent cut across all tariff bands) is set to be followed by another (possible 10 per cent) in April 2015, which will, in practice, come into effect this December as developers and landowners look to meet Ofgem's pre-registration deadline.

"While the positive reading is this has prevented a potential industry 'bubble', many will inevitably interpret this rapid




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Ongoing tariff depression as small and medium wind installations proliferate is, in turn, starting to slow down the rate of growth

IVO ARNUS

UK managing director of Endurance Wind Power Dave Rankin agrees farmers will still be able to see decent returns from more efficient turbines such as the firm's new 85kW E4660 wind turbine.

This new turbine generates 35 per cent more electricity than the original model, which means a lower cost of energy and an excellent return on investment (ROI) even at modest wind sites, effectively turning back the clock on the UK FITs to 2012 levels.

Financing

Given the impact of tariff depression on the market, the matter of how new installations are financed is important. With many banks unwilling to lend on small-scale projects, farmers are looking at more innovative solutions, for example joint ventures between landowners and developers.

For Arwyn and Cerian Ellis, hosting a 50kW wind turbine on their farm has given them the ideal opportunity to diversify their upland livestock business.

The couple farm 110 hectares (270 acres) of upland grazing and hill ground at Ty Isa, near Llanfihangel Glyn Myfyr, Conwy County. They are the family's fourth generation to farm the land and currently run 45 beef suckler cows and 850 breeding ewes.

Second turbine

With one turbine successfully installed and generating a guaranteed rental income, a second turbine will soon be constructed on a newly purchased 10ha (27-acre) plot, through a land rental partnership with Endurance.

Mrs Ellis says: "With meat prices constantly fluctuating and farm support payments set to diminish, we have made a conscious decision to ensure we have not got all our eggs in one basket."

Across the UK, the well-publicised interventions of the Secretary of State for Communities and Local Government Eric Pickles and changes to planning rules have presented another hurdle for would-be independent power producers.

These changes have ultimately slowed down the decision-making process of local councils as a growing number of studies and consultations are required in the early phases.



The Ellis family have installed a 50kW wind turbine on their 110-hectare (270-acre) upland farm.

"Often the process becomes so protracted developers are driven to file appeals for non-determination," says Mr Arnus.

"These appeals, in turn, take a long time to resolve with the local planning authority and frequently result in refusals which have a considerable impact on the bottom line."

Many refusals for farm-scale developments hinge on the visual impact caused by the turbine.

"In order to minimise the likelihood of refusals of this nature, Norvento always commissions experts to assess the potential impact of each prospective site on the landscape and will never proceed with an application if this impact is found to be significant."

"Likewise, many of the most sophisticated modern turbines are designed and painted with the specific goal of reducing noise and visual impacts."

"Visual impact is the reason why an application by Ellesmere beef farmer Robert Williams for a 50kW turbine was turned down."

Mr Williams, who finishes beef cattle for ABP/Sainsbury's says he has spent £22,000 in the planning process.

"I am trying to diversify my business and make sure the farm

is viable for my two children," says Mr Williams.

"It seems disheartening the council will not give permission for the wind turbine when Government policy says we need wind energy. I have been accused of being selfish and greedy by objectors. It has been a horrible experience."

Mr Williams is in the process of appealing the decision.

Grid connection

The suitability of a site for a medium-scale wind turbine is determined not only by its prospective impacts on the local environment but also the impact the turbine will have on the local grid. Grid constraints have posed a significant hurdle in areas of the UK market such as Northern Ireland, the South West and Scotland and are starting to pose a problem in some parts of Wales.

The challenge lies not only in bringing grid connections to remote locations at some distance from the nearest grid infrastructure, but also in the capacity of the grid to accept input from distributed sources," says Mr Arnus.

"In Northern Ireland in particular, a surge in the popularity of farm-scale generation, combined with outdated infrastructure has

We have made a conscious decision to ensure we have not got all our eggs in one basket
CERIAN ELLIS

led to considerable grid congestion which has thwarted many new developments."

Despite the constraints, experts believe wind energy presents a viable opportunity for farmers.

However, certain issues must be ironed out if the industry is to thrive.

Mr Arnus says: "The UK farm-scale wind industry as a whole needs to work in unison to foster best practice to address long-term financial and regulatory hurdles, ensure it retains its leading status in Europe and remains a viable investment proposition for lenders and landowners alike."

Wind turbines could be your most profitable crop



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Power to the farmer™

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Wind energy is enabling many farmers to not only diversify and earn extra income, but to increase their energy and financial security for the future. **Olivia Midgley** went to meet Richard and Debbie Symes to see how a wind turbine has transformed their Suffolk farm.

Wind turbine delivers financial security for Suffolk arable farmer

Richard Symes is understandably proud of the 275kW turbine which towers over his arable fields. Standing at more than 55 metres (180ft) high, the turbine generates enough power in the year to satisfy the electricity needs of 170 homes. By exporting the electricity to the National Grid, Mr Symes and his wife Debbie are enjoying another income stream alongside their arable and equestrian enterprises.

Mr Symes says: "We went for the biggest one we thought we could get on the site. "It would have been much easier to get planning permission for a turbine which was smaller like 10 or 15kW, but putting up a 15kW was hardly going to change our life in terms of the amount of money it will earn and the amount of difference it will make to our business."

Research

Mr Symes, who has been researching the industry since 2010, says 'getting the turbine up high' enables it to take advantage of higher wind speeds and better wind quality. "There is friction from the ground so you get turbulence. "The last thing a turbine wants is turbulent air, it needs a smooth, constant flow. People do not seem to think about that, but the efficiency can drop like mad." Working with ICE Renewables, the couple put a lot of thought into where to site the machine and chose one of the farm's open arable fields. "Position is important, especially in this part of the country. We wanted to generate wind energy and not just have a garden ornament," Mr Symes adds. "Our overall aim for Earlsway Farm is to produce prod-

Earlsway Farm wind turbine facts

- The 275kW turbine has just two blades
- The project cost a total of £750,000
- Cost of turbine: £350,000
- Grid connection cost: £84,000
- Total output in 2012: 500,000kWh
- Total output in 2013: 560,000kWh
- Electricity is sold for just over 5p per kilowatt
- Total income a year: £150,000

ucts and services for people in an integrated and responsible, yet commercial manner. "I think a lot of people put up a 15kW turbine and they think they are going green. While it is a step in the right direction, really, the contribution is miniscule. It is like putting a teaspoon of water in a swimming pool. "We were just lucky to be able to do it. After 10 years when we have paid back the bank loan, it is going to make us a nice pension." Mr Symes says there was little opposition to the turbine. "Out of courtesy I went round and spoke to our neighbours and one lady asked me if she would be able to see the turbine from her living room. When I told her yes, you probably will, she said 'oh good, I will enjoy watching it go round'. "I think you either love them or hate them."

It is not the first time the couple have ventured into green energy, they heat their house using a wood burner and use harvested rainwater to irrigate their horse riding arenas. "There is a real green ethos on the farm," adds Mr Symes. The stunning landscape features grassland, ponds, ancient woodlands and hedgerows. **Arable land** The arable land is used for the production of wheat, oilseed rape, peas and linseed oil. "We contracted the arable out four years ago and we were left with some redundant grain bins which we are converting and using in our rainwater harvesting," explains Mr Symes. "Because we have contracted out the arable side, coupled with the fact we produce our annual electricity in two weeks and export green electricity, it means our carbon footprint is minimal."



Richard Symes' turbine stands at more than 55 metres (180ft) high.

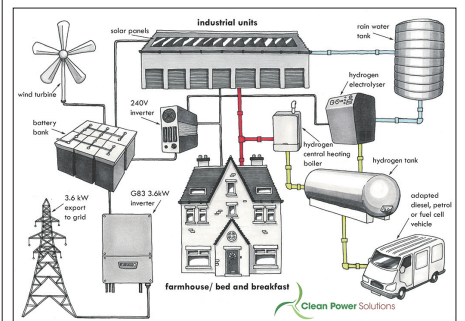
“ We were just lucky to be able to do it. After 10 years when we have paid back the bank loan, it is going to make us a nice pension ”
RICHARD SYMES

System stores wind and solar energy to convert into hydrogen

A BRITISH company has developed a system which stores renewable energy produced from solar panels or small wind turbines and then uses it as electricity to convert into hydrogen for vehicle or central heating fuel. The innovative system, developed by Resatech, means it is now possible to store all the energy produced from any size of renewable energy system and use it when renewable power is not available.

With every major car manufacturer having announced the development of hydrogen vehicles – several will be launched next year – it means farmers could potentially use their projects to tap into this lucrative market. "Electricity firms are positively encouraging companies and farmers to install the system. Now, any sized system can be connected to the grid without the need for expensive upgrades to the network." The Government recently announced an £11 million scheme to encourage the creation of a hydrogen infrastructure to provide fuel for the forthcoming hydrogen-powered vehicles. It means companies and farmers can now create their own fuel and at the same time create an income stream selling hydrogen to other users.

With every major car manufacturer having announced the development of hydrogen vehicles – several will be launched next year – it means farmers could potentially use their projects to tap into this lucrative market. **Connection** Renewables expert and managing director of Clean Power Solutions Dr Marc Stanton says the design (pictured, below) means locations which previously could not be connected to the National Grid can now be connected, enabling farm-



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