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PART OF THE RANDOLPH GROUP OF COMPANIES

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Contact Us

T: 02879 300606

www.farmenergyni.co.uk

info@farmenergyni.co.uk

Unit C2, 80-82 Rainey Street, Magherafelt, BT45 4AJ

BREXIT and the Wind Industry

With net imports of electricity accounting for 4% of the UK's power supply in 2017, it is not surprising that the potential of a no deal Brexit is causing some uncertainty in the energy industry. This could result in a greater requirement for locally generated renewable energy (potentially providing financial incentives to the medium wind industry), however the government may instead turn their focus towards the development of larger nuclear or CCHP plants to make up the shortfall.

Co-ordination of environmental standards between the UK and EU has allowed for strong development in the renewable energy sector over the past decade. Similar environmental standards would be critical in allowing future development of the industry if the UK leaves the EU.

It is well known that Denmark



Here in Northern Ireland, this issue is particularly prevalent due to I-SEM (Integrated Single Electricity Market). Assurances have been given that the distribution of energy between NI & ROI will be unaffected regardless of the Brexit outcome but collectively every effort will need to be made to preserve this during and after Brexit negotiations.

and Germany are two of the worlds leading countries in terms of manufacturing, research and development within the wind industry. It is therefore important for the UK's renewable energy sector that trade with these countries remains simple and cost effective otherwise many components may become more

Market Energy Rates

Since the introduction of I-SEM in Oct'18 up to 93% of the Power Companies traded their energy through the Day Ahead Market (DAM) with only 7% traded in the Balancing Market (BM).

Average Units €/MWh	Oct'18 to Feb'19		Mar-Aug'19	
	DA	BM	DA	BM
	€70.49	€65.21	€56.84	€53.34

For the first 6 months of this period the average DAM price was €70.49/MWh and this was evident from the high PPA fixed rates some Power Companies were offering.

However from the period March to August'19 the average DAM price dropped to €56.84/MWh (25%), an indication that I-SEM has settled and put downward pressure on prices.

Going forward we expect market rates to drop slightly before stabilising so anticipate Power companies to reduce their fixed PPA rates.

FARM ENERGY NEWS

Data Analysis & Reporting

Along with our sister company RES, we have been putting significant time and effort into developing a comprehensive data analysis process which enables us to better monitor and evaluate turbine efficiency and availability.

We can now offer our members a system to download and store their turbine data on a secure server. Free to all members data analysis which we carry out is evaluation of individual turbine performance when plotted against the manufacturers' published power curve. From this we are able to determine whether your turbines are performing as they were designed, or whether there are any adjustments that can be made to improve generation or efficiency.

If you have an O&M contract through RES, enhanced data reporting can be carried out on recurring fault and error analysis. This involves processing the data in turbine error logs to pick out any recurring faults which may be easily prevented from happening again. This also helps to carry out preventative maintenance as often a component close to failure will increase the frequency of certain faults. Proactive replacement of components can reduce downtime as maintenance can be planned in advance and carried out more efficiently, often in conjunction with pre-arranged service works.

Fault analysis can also be used to analyse the quality of the grid connection and incoming supply to the turbine. Often a weak grid can result in significant downtime

Wind speeds are a critical component of any wind turbine project. Doubling the wind speed generates eight times as much energy; this means that even an increase in one metre per second will have a major impact on the returns from a project. We can report that most wind turbine operators have got off to a poor start in January 2019 with two thirds of the production compared with last year. However, February made up for a slow start with 17% more than 2018. March and April were similar to last year, with a dip in production during May. The summer of 2018 was noted as one of the warmest in recent years. However, in terms of wind speeds, the results were negative, with

2018 - 2019 Wind Energy Production comparison



decreased production over the summer months. This is reflected in an average increase of a third during the June to September 2019 period. Despite this, a direct comparison between January 2019 to September 2019 and the same period last year, shows an increase in production of approximately 5%. This clearly demonstrates the importance of low pressure, windy periods in the winter months and how they can make a huge difference in the annual energy production for a wind turbine site.

A comparison of a Solar PV shows an opposite trend in terms of production with 2018 being a more fruitful year. A changeable, damp year compared to last year shows that while Solar PV operates well in normal conditions, there is no substitute for direct sunlight. In the first seven months of 2019, production was down between 12 and 15%. Finally, reports from Hydro projects report that there has been increased production in 2019, with one operator recently commenting that the production in the first three weeks of October was the equivalent of the whole of summer 2018.

All this is even more interesting if you happen to have a wind turbine, a PV system and a hydro turbine on your farm; could this be the Holy Grail in agriculture – a happy farmer despite the weather!

FARM ENERGY NEWS

Next Steps for Grid Code Compliance

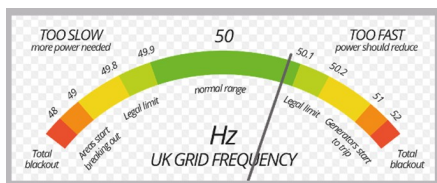
With an increasing number of renewable energy generators across the UK, this additional generation has had a significant impact on the transmission network and on the stability of the network frequency and reactive power consumption in recent years.

Because renewable energy generators (eg. wind turbines) are generally non-synchronous this causes difficulties for both Transmission Network Operators – National Grid and SONI - in managing overall grid frequency and the Distribution Network Operators such as NIE (Northern Ireland) and SSE, Scottish Power etc. This is because non-synchronous generators are less responsive to changing grid conditions or requirements. In order to accommodate a requirement for increased generation from renewables across the UK, the Energy

public and damage to the generator. As a result, NIE have begun to roll out a programme of changes to the overall network and individual generating sites such as wind turbines. Stage One is designed to address the SONI grid frequency requirements and affect small scale generators of all sizes. However, Stages Two and Three seem more focused on bringing small scale generators in line with large scale generators by giving NIE more control over power factor and reactive power consumption through remote SCADA access to each individual generator. Currently NIE are targeting these stages at generators with a grid connection capacity of 200kW or above except for some smaller turbines in more sensitive areas.

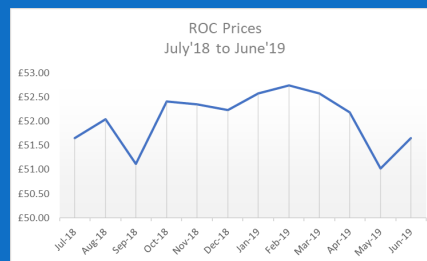
A similar programme will follow across the rest of the UK in due course but with a key difference. In Northern Ireland, NIE are requiring individual generators to meet the cost of these changes while, in England, Scotland and Wales, it seems the cost will be met by the wider industry through the Balancing Services Use of System (BUSOs) charges. These recover the cost of day-to-day operation of the transmission system. Generators and suppliers are liable for these charges, which are calculated daily as a flat tariff for all users.

In Northern Ireland, Stage One is already nearly complete with Stage Two to be complete by this time next year. In contrast, in the rest of the UK, DNOs are only at the very early stage of inviting contractors to tender for approved status to be considered suitable for carrying out these works so it is unlikely to become a reality in the imminent future. Watch this space.



Northern Ireland, following the regulator's approval of SONI's new Rate of Change of Frequency (RoCoF) limit, NIE Networks were requested to move the G59 RoCoF setting on all distribution connected generation to accommodate the new standard. G59 protection is required to ensure that turbines trip off following a loss of mains in order to avoid danger to the

ROC Update



Benefits of FENI Membership

- Complimentary Project Review
- Provision of an OFGEM Audit File
- Regular news and updates
- Tailored reports and market intelligence
- Opportunities to access money saving Business Services
- Participation at FENI network events and experts
- One-to-One professional support and advice
- Half-Hourly Data Analysis & Reporting
- Offers and discounts
- Invitation to the annual conference
- Collective representation on consultations and policy

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Members News

Customer Online Portal

We will be soon replacing OneDrive with a new online web portal. The system will allow you to view and report on the generating station/s finances and production and securely store your invoices and Half-Hourly Data. Access to the portal will be through our new website. We will be in contact with your login details and guidance.

New Website

Along with the portal a new

website is available showcasing our products and services, news and events. Coming soon to the website will be member offer and discounts plus a chance to profile your own story.

Date of the Diary

Our Annual Conference will take place on 29th January 2020. The event will include speakers on Battery Storage, Tax Advice, Green ISA Bond, Grid Code Compliance and a keynote speaker from NI Renewables Sector. Invitations will follow in due course.

Randolph Group News

Farm Energy NI are now part of the Randolph Renewables Group of Companies. Taken together the Group offers a suite of products and services that create and support energy projects for their entire lifetime. The Group operates in the following energy sectors:

- Renewable Energy – Wind, solar, Biomass, Hydro and CHP
- Energy Efficiency
- Energy Storage Solutions
- Energy Offtake and Supply
- Project Finance and Investment

As well as **FENI**, the companies in which the Group has an interest comprise:

- **Realise Energy Services Ltd.**—
- **RG Developments** - a company that specialises in the acquisition and development of pre-development or operational renewable energy assets.
- **Future Renewables Energy Eco Ltd.** – a renewable energy investment company. FREE has recently launched its first ISA Wind Bond. Please visit www.free-wind-isa-bond.co.uk for more information.

Creating the Group underpins each company with financial security and stability, which in turn can be passed to our customers and members. This allows work and projects to be progressed in the knowledge there is financial backing and payment guarantees. The Group has offices in Perth, Edinburgh, London and Magherafelt, Northern Ireland.

