



THE BIG DEBATE

The wind industry is constantly evolving and new ideas and innovations are a welcome source of change and regeneration. We asked five pioneers in the field – from five diverging sectors – to give us their views on where we're headed and how they are helping to encourage the evolution of an industry.

Once again, we present our exclusive roundtable interview...

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PES: Can you explain a little about your background and how you ‘serve’ the wind industry?

Fraser Gillies: As a firm we’ve been involved in acting for wind energy developers for around 20 years, from the earliest days of the wind industry in Scotland. We help our clients deliver wind projects by offering advice on the whole lifetime of a project from securing the necessary land rights, through to taking the project through the planning and consenting process, and to financial close. Our knowledge of the industry allows us to deliver more than just legal advice however. We know what is important to our clients and what the key challenges facing the industry are.

Phil Grant: Baringa Partners are advisors to numerous stakeholders across the wind and energy industries, including Government and policy makers, investors, developers and manufacturers. We help clients make better-informed decisions in light of complex regulatory frameworks, challenging political environments and uncertain fundamental conditions. We work across all technologies and for stakeholders throughout the wind supply chain. Much of our work is in quantifying the costs and benefits of alternative policy decisions and the impact this has on the three core areas facing the industry – security of supply, sustainability and affordability.

Haydn Scholes: I’ve been in the renewables industry for over 30 years with experience in a wide range of technologies from wind to geothermal hot dry rocks. In that time the industry has grown from a few enthusiasts with green tinted spectacles to a serious commercial player that’s now challenging conventional power sources for market share.

I currently lead Wardell Armstrong’s Energy and Climate Change service sector where

most of our business is in onshore wind and large scale solar PV farms, primarily planning and environmental services but also site finding, feasibility and design, some civil engineering and more recently acting as client’s engineer during tendering and construction.

Steve McMahon: My name is Steve McMahon and I am the VP Sales & Marketing for a Canadian company called Orenda Energy Solutions. I am a Chartered Engineer and MBA and for the last 25 years I have worked in a wide range of high technology businesses around the world. For the last 5 years I have been involved in the wind industry, specifically in the small-medium wind sector.

Orenda Energy Solutions is a new company which we started in May 2012, with a mission to bring innovative and efficient renewable energy solutions to the market. Our first product is Skye (™), a 51kW wind turbine system targeted at farmers, landowners and investors.

PES: What are you working on at the moment?

Fraser Gillies: We’re working on a range of projects across wind, solar, hydro, wave, tidal and biomass. In relation to wind we are working on a portfolio of sites in Scotland, England and Wales at different stages in the development process, including a number of large s.36 schemes, the largest of which is for a proposed 93MW development. As well as negotiating land rights for a pipeline of new projects our planning team lead by Fraser Gillies is advising on several projects currently at Appeal, and we are also acting in relation to the proposed disposal of a large consented site.

Phil Grant: Our current focus is helping clients navigate through the upcoming contracts for difference (CFD) auctions and

understanding the trade-offs between the new CFD framework and the existing Renewable Obligation mechanism. The government has set a very clear overall budget and subsidy allocation framework. It is now for participants to bid for CFDs and see whether their projects are sufficiently competitive to be awarded a contract.

The CFD mechanism has certainly changed the risk profile for developers: under the old regime the key uncertainty was revenue risk, now the challenge is being awarded a contract in the first place.

Whilst this remains our current focus, as soon as the contracts have been awarded we will switch our attention to working with lenders to ensure the projects are financeable and have a clear route to market strategy.

Steve McMahon: Having spent the last two years designing and testing our 51kW Skye Wind Turbine System, we have now just entered the execution stage of our Marketing plan. The first stage of our marketing plan involves us specifically targeting incentivised markets such as UK and Italy. These markets provide us with a short term opportunity to build a business, capable of addressing a sustainable long term strategy targeting off-grid applications where electrification is either non-existent or weak for remote communities and/or commercial enterprises.

Martin Sweeney: Schneider Electric invests nearly €1 billion globally into research and development of products and solutions to meet the global energy challenge. At the moment we are developing a solution to meet the change in the market of increased turbine sizes in conjunction with the geographic distances associated with around three offshore wind farms.

“This will be a critical few months for the offshore industry. There is some new capital (infrastructure funds and pensions funds) flowing into operational projects, yet at the same time we have seen utilities withdrawing and cancelling development projects”

Phil Grant

PES: What are your thoughts about the state of the offshore market in particular right now?

Fraser Gillies: Our perception is that offshore is not progressing at the rate which the Scottish Government hoped that it would. The achievement of the 2020 targets is premised on consents being issued for several GW of offshore wind. However we are seeing considerable withdrawal of investment in the sector, with many large players pulling out of projects at the application stage.

This appears to be at least in part because of the extremely high costs which are still associated with developing offshore, as well as the continuing political uncertainty and uncertainty in relation to future incentive mechanisms as well as the uncertainty around provision of the necessary grid infrastructure. Where that leaves offshore remains to be seen – it certainly seems the development of the sector is being set back by several years.

Phil Grant: This will be a critical few months for the offshore industry. There is some new capital (infrastructure funds and pensions funds) flowing into operational projects, yet at the same time we have seen utilities withdrawing and cancelling development projects.

This creates a funding gap between development and operational projects that has the potential to stall momentum in the industry. This is a risk because the offshore market, more so than onshore, needs the sustained development pipeline to develop the supply chains and achieve the cost reduction targets.

Martin Sweeney: Looking specifically at wind we are seeing a drop-off in large onshore winds and an increase in smaller sized projects which is a change in the market for us, conversely we are seeing a larger generation of individual turbine heads for the offshore projects. The challenge is to ensure that we have an offer portfolio of products and services wide enough to satisfy both these ends of the market.

Haydn Scholes: Sinking without trace (almost) despite the current level of pro offshore wind publicity. The offshore wind industry just isn't living up to its original promise. Despite a good start, several

major projects have recently collapsed, ostensibly due to difficult ground conditions but more likely difficult economics with major players pulling out of the industry because there just isn't enough profit on some sites given the current costs and subsidy levels.

Offshore wind is also on a promise for big cost reductions in the future but I think these will be difficult to fulfil in the timescales involved. Given more time and the inevitable long term rise in the cost of electricity, it will resurface again as a major component in the UK energy mix.

PES: In 2009, we asked our roundtable interviewees if they thought that social media had a part to play in driving the industry. They thought not. Five years on, do you agree?

Fraser Gillies: It's certainly the case that those opposed to wind energy development make effective use of social media to convey their message. It might be said that the wind energy industry could perhaps make better use of social media to convey the counterbalance to those views and communicate the positive benefits of wind energy.

Martin Sweeney: In a word no. Schneider Electric believes in digital media as a fast and interactive forum with opportunities to communicate to a different audience where traditional B2B media was the norm for our organisation. We are using twitter extensively to communicate to the general public about projects, as well as answering queries. I believe that the industry as a whole should embrace this digital media as other industries have.

PES: Which aspect of the industry provides the most satisfaction for you right now?

Fraser Gillies: Assisting clients to bring their projects to fruition by providing advice at all stages of the process. It is genuinely gratifying to see a project come to completion after years of work and significant investment, and to know that the project will have made a contribution towards the 2020 targets.

Martin Sweeney: At the moment the development of specific solutions to meet the changing market demands associated

with the round three release of offshore wind farms is providing the most satisfaction, although we cannot release any specific details on the solutions at the moment. However we can confirm that it will have UK-added value which is very important to Schneider Electric and the supply chain.

Haydn Scholes: Securing planning permission and a good grid connection offer.

PES: And where do the main challenges come from?

Fraser Gillies: As well as grid infrastructure, the planning process is a recurring complaint which we hear from developers. The process continues to give rise to considerable delay and uncertainty. In Scotland reform of the planning system has meant that many applications are now dealt with without the opportunity for any form of an Inquiry or hearing session. In some cases that is appropriate but there are other cases where disappointed developers may feel they have not had a fair hearing of their application where a request for a public inquiry has been refused.

There are also considerable issues around a lack of investment and funding which is partly due to a lack of certainty in government policy in relation to the renewable energy sector. Where there is emerging certainty it is not favourable – for example in relation to the move from ROCs to contracts for difference and the associated process for bidding for contracts which are being proposed. These are likely to have a very significant effect on the financial viability of many wind farm sites.

Phil Grant: There are two main challenges: preparing for the upcoming election and divergent attitudes towards the future role of onshore wind between the parties.

The development and operating lifecycle of generation assets is much longer than the electoral cycle. While there is broad cross-party support for the long-term decarbonisation targets, the technology choices to deliver this decarbonisation outcome are highly politicised.

The UK is now on track to deliver a substantial proportion of renewable

“We are investing in graduates and apprentices to ensure that there is a legacy of this knowledge within Schneider Electric when the projects are complete”

Martin Sweeney

electricity by 2020 (although we may yet still fall short of the overall renewable energy target). The industry now needs to see meaningful targets for 2030 and beyond in order to build enduring supply chains and hence achieve the required cost reductions.

Haydn Scholes: Securing planning permission and a good grid connection offer.

PES: How are you working to meet these challenges?

Haydn Scholes: We're exploring alternative (i.e. restricted) grid connections with some DNOs for smaller projects but there isn't much we can do about the increasing politicisation of planning decisions. There is compelling evidence in recent surveys why all political parties should support onshore wind - the UK's cheapest renewable energy source. Unfortunately politicians often take more notice of who shouts loudest rather than the quieter voices that talk sense. This, the lack of 2030 targets and constant fiddling with subsidy levels unsettles investors. Not the best way to promote a successful industry.

As a work around to grid problems, Wardell Armstrong is promoting the Solarwind concept where existing solar PV or wind farms can share the same grid connection with a complimentary wind or solar installation on or near the same site. Most of the power for wind is produced in the winter whereas it's in the summer months for solar PV. The trick is to get the right balance between the two, avoiding over-capacity at certain times of year.

We've developed some software and invested in data to optimise the mix anywhere in the UK. The first project to be built out is a 3.5MW solar PV extension to the Goonhilly Wind Farm in Cornwall. We've also undertaken a number of feasibility studies for clients. You can even make solar PV work in Scotland this way.

PES: We speak to experts from all sorts of areas of the industry that find it difficult to recruit staff. Is this a problem for your organisation?

Fraser Gillies: Yes. The legal sector is still recovering from the effects of the recession in that there is a shortage of suitable candidates for most positions related to the

wind industry. This has been caused by a number of factors including qualified solicitors retraining in other areas of work and some firms cutting back on traineeships.

Martin Sweeney: The wind industry has very specific skills and competencies necessary to complete a wind farm either on or off shore but the part of the industry Schneider Electric is associated with is still a traditional strength of Schneider Electric and in that sense that we can recruit the competencies and skills easier than other parts of the supply chain. We are investing in graduates and apprentices to ensure that there is a legacy of this knowledge within Schneider Electric when the projects are complete.

Haydn Scholes: Yes and no. We have good relationships with a number of universities that can supply us with quality well rounded renewables graduates but getting experienced staff with exposure to multiple technologies has always been difficult. Renewables as a degree course has expanded rapidly over the last five years, so hopefully in a few years the experienced staff gap will be plugged.

PES: Is the energy infrastructure in your main region of focus developed enough to support wind's growth?

Haydn Scholes: It's well developed in consumer terms but insufficient for the wind and solar resources we have. It's now practically impossible to get a grid connection for a decent sized project in the whole of the West County. Things aren't much better in South Wales, Yorkshire or the North East. In some respects we are a victim of our own success.

Projects naturally gravitate to where the best resource is, which stresses the local grid and eventually the whole underlying infrastructure needs reinforcing.

The DNOs are still approaching this on a project by project basis. We have several clients with connection offers of over £7M to connect 500kW turbines as a significant length of 33kV and 132kV line needs to be upgraded. To some extent the DNOs' hands are tied by their charters but surely it's not beyond the wit of man (or DECC/OFGEM) to sort this out. It's hardly a speculative investment on the DNOs' part where there's

a demonstrable demand for more grid capacity from the industry.

Fraser Gillies: There are still significant challenges in relation to grid infrastructure. Many of the large projects which it is hoped will contribute towards the 2020 targets are entirely dependent on interconnectors to the Western Isles, Orkney and Shetland, which is where Scotland's best wind resources are located.

This will bring much needed employment and investment to these areas. In addition, the interconnectors will facilitate the development of wave and tidal power. This lack of grid connection means that generators are unable to take advantage of the financial incentives which will be available through the Contracts for Difference regime.

PES: Is the domestic (small) wind market now dead and buried?

Steve McMahon: When FiT was introduced on 1st April 2010, the FiT (generation tariff) for a 50kW wind turbine was 25.3p/kWh. In addition the end-user would be able to use the generated electricity to offset his/her electricity bill and receive an export tariff for anything not used by the end-user and exported to the grid.

Therefore, it would not be unreasonable to imagine a situation where the end-user could receive a total benefit of approximately 40p/kWh. This was important as it really did kick-start the interest in this sector by farmers, landowners and investors to invest in the necessary distributed electricity generation strategy for UK.

It provided good pay-back periods and ROI %, sufficient to entice these potential end-users to take a risk.

This strategy of combining the FiT (generation tariff) with the offset against electricity bills and the export tariff was the intended consequence of the scheme as originally intended.

However, due to the large "headline" figure of the FiT alone, many customers invested in wind turbines to obtain the FiT with little regard to making use of the electricity to offset their electricity bills. The FiT alone was sufficient to drive decent pay-back periods and ROI %, such that many

customers did NOT behave in accordance with the original intention of the scheme.

In addition, this also drove a behaviour amongst customers and investors to install as large a wind turbine as practically possible to maximise the returns via the FiT. There was little regard for sizing the wind turbine to optimise usage by the property as usage offset was not considered material in the scheme of things. Customers were focused almost exclusively in maximising their returns based on the FiT alone.

In the intervening period since 2010, the FiT tariff level for a 50kW wind turbine has dropped to 17.32p/kWh, a drop of >30%, via the degradation scheme. This dramatic drop in FiT has interestingly started to modify the behaviour amongst the target end-user customer groups such that we are seeing a move to augment the degraded FiT with the usage offset element, so that the types of pay-back periods and ROI % available back in 2010 could be approached once again through a more considered and thought out approach.

This involves a careful sizing of the wind turbine to maximise the opportunity of usage offset, which in turn will see a move to smaller wind turbines in proportion to the usage requirement of the customer's property and/or commercial enterprise.

What we will see is a "back to the future" move whereby a more sustainable market will emerge for appropriately sized small/medium wind turbines where the combination of FiT, usage offset and export tariff will be key, with the usage offset element beginning to play a larger role as electricity prices continue to rise.

Haydn Scholes: I hope so. Houses = noise complaints, low wind speeds and turbulence. Not exactly the best place to put turbines of any size. Most of them perform badly and I have serious doubts about their longevity and their effects on the structures they're mounted on. Small turbines can work well but need to be on open ground and exposed to decent wind speeds.

PES: We're interested in the role that ancillary sectors play in driving wind industry growth. Do you agree that we're seeing more consolidation and collaboration between organisations?

Steve McMahon: We are certainly seeing an increase in collaboration as solutions become more "out the box" and whole to address a maturing market, where end users take a more pragmatic view. A very good example of this is the migration from "early adopter" customer to "investor-customer". The "early adopter" simply WANTS to own a wind turbine and is willing to put up with an

incomplete solution. In fact this type of customer enjoys the incomplete nature of the system as this offers more scope to "play" with his new "toy".

On the other hand, the "investor-customer" naturally adopts an extremely pragmatic view looking only at the financial business case in the project, and therefore demands an "out the box" solution that "does what it says on the tin". In most cases this degree of solution requires collaboration between organisations such as wind turbine manufacturers, developers, funders, installers, etc.

PES: Similarly, has there been enough progression in complimentary technologies such as smart meters, storage, grids, etc.?

Haydn Scholes: Energy storage is going to be critically important to our future energy mix. There are some interesting developing technologies that are appropriate for large scale wind and solar PV, e.g. redox flow cells and liquid metal batteries.

These systems are only just becoming commercially available and with volume production will hopefully make large scale storage a lot cheaper. On the smaller scale, SMA already offers lithium ion batteries as a standard add-on for their inverters.

Storage doesn't only have a place in smart grids for balancing demand and supply. Bearing in mind the limitations with current grid connections, we could almost double the solar PV capacity on existing sites by adding some storage, exporting its output when the panels aren't generating (i.e. at night) and also potentially picking up some extra revenue by delivering base load power. A similar rationale applies to wind.

Phil Grant: While there has been some progress in the deployment of the technologies, the innovative commercial and operational strategies that maximise the economic and environmental value have yet to fully emerge into the mainstream industry. This is an opportunity for the medium term.

Steve McMahon: There are several key challenges that wind power needs to address: The vast majority of the world's land mass does NOT experience winds greater than 5m/s (average annual wind speed at >10m). The current technology that all horizontal axis wind turbines are based on does NOT operate effectively in these low wind regions. Therefore there needs to be a focus in R&D on designing wind turbines that can produce electricity efficiently in these low wind regions of the world.

This is particularly important when one considers that 25% or one quarter of the

world's population are without any electricity at all! This is the ultimate target market for small-medium scale wind energy, where there is real pain. A very small percentage of these regions experience what we would regard as decent wind for wind turbines to operate efficiently.

Linked to the point above concerning low wind technology, there is a growing need for hybrid renewable energy solutions, combining different types of renewable energy generation e.g. wind and solar PV in conjunction with efficient and practical storage technologies. Hybrid solutions are being deployed today. However, they are largely bespoke (custom) one-off solutions designed specifically for each individual application which results in high cost, low quality and hard to maintain solutions.

There needs to be a focus within the renewable industries to encourage partnering between companies who are expert in their own specific space, be it wind, solar, storage, power electronics etc to develop true plug and play hybrid solutions.

PES: Year upon year, turbines are increasing in size. Would you agree that we perhaps need smarter turbines instead?

Fraser Gillies: There's certainly something to be said for more efficient turbines – and also for more efficient monitoring and control software to make sure maximum efficiencies are being achieved from operational wind farms. The reality however is that turbine sizes are likely to continue to increase, and that we will see developments of fewer, larger machines making up a larger part of the overall onshore wind portfolio.

Steve McMahon: In short – yes! The transition towards larger and larger was driven by the returns available via the UK FiT program. The problem is that it is becoming tougher and tougher to find sites for the larger turbines due to tip height and grid constraints.

This incentive led market is artificial to some extent and certainly time limited. To meet the longer term requirements in a sustainable "real" market for off-grid solutions we will certainly require "smarter" turbine systems including better low wind performance, efficient storage capabilities and off the shelf hybrid solutions incorporating wind, solar, storage etc.

Martin Sweeney: There is a direct correlation to the generation capacity of the turbine and its physical size. There are applications where large turbines will naturally be better suited as you increase

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Fraser Gillies

capacity and specifically in offshore wind projects where public objection would be minimal. Small turbines for small community onshore projects will be required we need to ensure that the mix is correct for the application and the geographic location of the specific wind farm.

PES: Do you feel that the wind industry has won over the general public? Or is there still PR work to be done?

Fraser Gillies: Recent studies suggest that wind energy remains popular. A recent DECC opinion poll put support as high as 70%. However it is by no means the case that the general public have been won over. There are still large sections of the public opposed to wind energy for a variety of reasons including because of perceived impacts on tourism, recreation and landscape impacts, as well as misunderstanding and misconceptions about the true cost of wind energy development. There is undoubtedly an on-going PR job for the industry to combat the myths which are often perpetuated and to communicate the significant benefits which flow from wind energy.

Haydn Scholes: As a green energy source yes but there is still work to do in terms of security of supply and how cost effective it is compared to other renewables and low carbon alternatives. Most of the UK’s coal and nuclear power plants will be at the end of their lives in the next decade and there will be a gap replacing them with the next generation of nuclear plants (even when they receive higher subsidies than onshore wind). The solution of both the current and previous government is/ was to use combined cycle gas turbine plants as a stopgap.

These already generate as much of our electricity as our coal and nuclear plants combined. However this will have to double when the coal and nuclear plants go off-line and our demand for gas will increase proportionately. Despite the current propaganda, UK shale gas won’t fill this gap and inevitably the price of gas and hence electricity will increase. There is also the problem of security of supply. Most of the UK’s gas is supplied from regions of the world with less than ideal political stability and with consequential supply risks.

Wind is an indigenous resource and the UK has some of the best in Europe. As a fuel for our wind turbines, it’s free. Unfortunately much of the general public is either unaware or poorly informed on these issues which will have a much more direct impact on their wellbeing than greening up the planet. The industry needs to publicise these benefits in a much more comprehensive way.

Martin Sweeney: There is still an element of ‘not in my backyard’ regarding the larger onshore wind farms, however the industry has a good job in highlighting the benefits of green renewable energy to the public. The market for smaller community sized wind farms is increasing giving an indication that the public are more acceptable to the benefits of green energy

PES: What’s your on-the-ground assessment of the coming 24 months for wind, as far as your organisation is concerned?

Fraser Gillies: We think there will continue to be opportunities – particular in the post –referendum market where considerable uncertainty has been removed. However the uncertainty has not been removed altogether as it remains to be seen what devolution will mean for the Scottish Government’s powers in relation to regulation of the Energy market, as well as the attitude of the Scottish Government following any change in leadership.

We may also see refocusing of investment in to Scotland from south of the border where the political climate certainly seems to be more hostile to onshore wind. Finally there is still much to be settled in relation to the financing of projects, including the incentive mechanism and the availability of project finance, which is scarce.

However there are also considerable opportunities to be exploited. The new Scottish Planning Policy remains, overall, supportive, and there are still many excellent opportunities to develop new sites in Scotland and to maximise the potential of existing sites. We also see the market for acquisitions and disposals of portfolios of consented sites to be likely to begin to take off. We expect those opportunities to continue in the next 24 months and as a result we expect the team to continue to be

very busy advising clients across the sector.

Martin Sweeney: To surmise we feel that the coming 24 months will see the amount of large turbines for offshore wind farms increase which we hope to be a key player as well as smaller community based wind farms increasing. We fully expect that the government targets for the total amount of energy generated from renewables will be met with a full realisation of the R3 release of offshore wind farms.

Haydn Scholes: I will let you know after the next general election!

PES would like to thank all our roundtable contributors. For more information, please visit their respective websites:

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