Distributed Energy

In this podcast, Henry Edwardes-Evans, Managing Editor of Platts Power in Europe, interviews Mike Wilks, Senior Principal of the Pöyry Management Consulting Group, on distributed energy, how it is growing dynamically in the European markets, how it may affect the systems and where the opportunities and threats lie in this sector.

Interview recorded on March 4, 2013

Henry: Welcome to Platts Energy Spotlight podcast for March the 4th, 2013. I’m Henry Edwardes-Evans, Managing Editor for Platts Power in Europe and today I am joined by Mike Wilks of the Pöyry Management Consulting Group. He is a senior principal there and we talked earlier today about distributed energy and how this growing dynamically in the European markets and how it might affect the systems and where the opportunity and threats are in this sector. This is ahead of Platts 4th European Power Generation conference which is taking place in Düsseldorf on the 22nd of April.

Distributed energy has been growing dramatically in recent years Mike, can you characterise the growth for us and tell us where the greatest additions are taking place?

Mike Wilks: Yes. I think in recent years the primary focus for distributed energy, certainly at a domestic level has actually been in solar PV installations, and we’ve seen a lot of that particularly in southern Europe to begin with, countries such as Italy and Spain as you might imagine. However, in recent years Germany has overtaken both of those countries to the point that now they are the largest share of solar distributed energy in Europe - I think about 25GW of capacity in Germany as we speak - and so I think that’s where we are seeing the major activity. For a long time we’ve had discussions about micro CHP, and even more recently micro wind, but it is in solar generation that we are seeing by far the largest activity in Europe.

Henry: Why do you think that is? Is it just down to unit price and how simple it is to install?

Mike Wilks: I think it is an element of the subsidy regime that we’re seeing in a number of different countries supporting the decarbonisation of the energy sector in general; and certainly solar energy received very generous subsidies in the early days when the technology was still developing. Even though some of those subsidies have been curtailed quite materially in the last couple of years, what we’ve seen is the cost of technology has equally plummeted with strong growth in the supply chain from China, for example. So you’re finding that it’s very attractive for people to install this energy because they’re getting very attractive financial terms.

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Henry: So, do you feel that the boom in Germany in particular will continue? Obviously there will be some kind of slowdown, will there?

Mike Wilks: I think there will be a slowdown to some extent. I mean, the bulk of the development in Germany has been in the southern parts and there are only so many roofs that you can put panels on, so I think they have got to a stage where it will begin to tail off over the next few years. There are still strong natural drivers though, as the German society is very much wedded to the green ideal and with the curtailment of the nuclear capacity in that country, there is a lot of attention switched to how can we help de-carbonise if we haven’t got nuclear. So solar energy will certainly play a key part of that, and you will see that in the wind sector in Germany as well.

Henry: Are there other European markets which will begin chasing solar as hard as Germany or Italy?
Mike Wilks: Well, I know Greece are looking very seriously at how they can exploit their solar resources - if you want to call it that - as part of a way of getting themselves out of their current economic crisis. It may well be a way of helping the Germans meet their energy needs and so they are looking at potentially getting some investment in from Germany to support them developing solar generation at substantial scale in Greece. I think you see both in Greece and Spain a focus on not just the domestic level solar but also a larger scale distributed solar energy on commercial sites. I think that’s the next stage of development we are going to see, namely more and more commercial and small industrial scale solar development in southern Europe.

Henry: Is that an area where the utilities can get involved? Because, who are the major players in this market? Are the utilities slowly getting into this or is this more of an opportunity for municipals and new entrants in community organisations?

Mike Wilks: I think it is very much the latter in certain parts of Europe; certainly the network companies as a rule are not able to invest in this technology and in fact it is the other way around. The technology is coming in from third parties, domestic users, or industrial and commercial users deciding to do this, and the utilities now have to respond to the demands that this is then placing on their networks and knock-on impacts on their larger scale generation fleet in the way that they operate. So, I think utilities are more in the space of having to deal with the consequences of this surge in distributed energy rather than being part of that surge.

Henry: So what does this mean for the networks themselves? I mean, I see both sides of the argument put that for DNO’s this might reduce the need for major investments but then, at the same time, it adds complexity to the way they operate.

Mike Wilks: I think the complexity is the key word here. I think when we talk about distributed energy you really are into the world of location, location, location. Most distribution networks - certainly in GB - were designed for power to flow from the national transmission system down to end users in a single direction, in a fairly predictable manner. Thus, year-on-year you could fairly predictably expect what the growth in demand on those networks might be and what investment you would need to do to accommodate that, and with a limited operational control of those networks, certainly in real time, compared to transmission networks. What you’re seeing is that this growth of distributed energy is putting a lot of pressure particularly on distribution networks, and hence you see a lot of discussion of the term smart grids and smart energy.

Transmission networks are typically smart grids as they have control centres that manage the frequency and other aspects of the networking in real time. Distribution networks do this much less, so in this new distributed energy environment distribution networks are facing up to the need for developing a more accurate understanding of the behaviours of their networks in operational time frames, and increasingly use of technology not just to monitor what’s happening but to manage what’s happening on their networks. Hence you start talking about distribution system operators not just asset owners. So I think there is a growing shift in the way that the energy chain is going to behave in a way that makes local issues far more important and the lives of local networks far more complicated than they have ever been before.

Henry: Do you think that Europe’s regulators are fully up to speed on that?

Mike Wilks: In a word no. I think where we have been in the whole smart energy arena which covers smart metering, smart grids, storage is that the entrepreneurs, technology providers and now increasingly the network and utilities have seen the issues, the opportunities and are developing solutions. Technical capability if you like is there and the understanding is there; what’s lagging is the market frameworks and regulatory frameworks to facilitate the economic and secured employment of these technologies. Thus, if you talk to many of the stakeholders in Europe - whether they be distributed energy developers or people that are impacted by the distributed energy - they will say that one of the key things that need to be examined over the next couple of years is how the markets should be refined in their design, and the regulatory framework refined in their definitions, to support this changing dynamic towards more intermittency on the system, more disaggregation of technologies on the system, and more dynamic behaviour on the system.

Henry: Is there anywhere that we can look for a regulator actually leading the way on these issues?
**Mike Wilks:** At the risk of looking at our own home market I think OFGEM has now begun to take some meaningful steps towards looking at what the smart world looks like in the energy sector going forwards. They have certainly launched, together with DECC [UK Government] initiatives such as the smart grid forum, trying to understand what the cost benefit cases are for different ways of developing a smarter distribution infrastructure around potential distributors energy development. If you look at the markets such as Australia, California and US there’s a lot of experience there in relation to deployment of demand side management technique and services, use of ICT around smart metering to manage the complexity of distributed energy and intermittency at a more local level. So there are definitely lessons to be learned from other international markets I think the caveat I would say is every market is different so it’s not a simple case of dropping in someone else’s solution: you need to understand why that solution is in place there and whether its translatable into your particular content.

**Henry:** On smart meter roll-out across the whole of a household sector, is that a crucial element of this or can you get away with partial roll-out?

**Mike Wilks:** Depends where you put them. I think that the general feeling is that a lot of what happens in terms of distributed energy and other smart technologies such as electric vehicles, is that you get what you call hotspots to get clusters of development to the extent that the metering or the monitoring technologies are clusters in the same areas; then yes you can get away with partial roll-out. However, if you haven’t got an alignment of those hotspots to the metering roll-out, then you have to go for the sledge-hammer approach of putting them everywhere. In an industry where you’ve got silos between distribution networks and supply - it’s certainly difficult in this country to align seamlessly, shall we say with potential hotspots from a distribution network’s perspective and rollout plans from a supplier’s perspective.

**Henry:** Now you mentioned storage there as one of the emerging technologies. Where are we with these units for households, or networks indeed, how might costs evolve, and does photovoltaic give us a pointer or batteries unlikely to decline in costs to the same extent?

**Mike Wilks:** I think batteries have struggled to show a cost reduction path. I think the jury is out as to what the potential is there for cost reductions and there are different types of batteries from lithium-ion to sodium-sulphide. Storage is a very diverse set of technologies, everything from a few kilowatts up to tens of megawatts; and it covers a range of different technologies, some of which are better for rapid power requirements being met, some of which are better for providing more sustained energy (such as pumped hydro) but I think, at the smaller scale end, there are still a number of embryonic technologies and there are still some going through the commercial maturity phase. My general view is that when these things take-off a bit, like any new technology, you get to a certain point where the critical mass and the momentum is such that the costs begin to collapse as the supply chain really gears up. We saw this with solar panels: as soon as the Chinese geared up properly and the Americans got involved, the costs have started to plummet. I think whether that will happen to the same extent in storage is still an open question, but it’s clearly now a part of the equation that people are talking about actively within the future energy landscape.

**Henry:** And could make quite a significant improvement to the performance of the panel.

**Mike Wilks:** Yes. Storage is talked about in two ways. I think small scale storage is talked about being linked close to demand, and therefore domestic demand or commercial demand, and would have particular benefits in optimising use of solar PV for example. The larger scale storages are often talked about as being better source close to large scale wind and optimising the use of that wind. Many of the benefits that you get from storage relate to avoidance of other investments that you otherwise need, for example, and network capacity that’s at a local level or national level.

**Henry:** How big could this get Mike, distributed energy, could it be capable of matching one of the central plant technologies one day?

**Mike Wilks:** I think that’s all going to come down to technology costs. There is certainly an expectation that distributed energy in terms of a global market will be very substantial indeed. That’s why a number of countries are looking at developing their manufacturing and technology capability in this area because they see it as a future global market and,
therefore, if they are first in the game, then there are a lot of economic benefits to be exporting technologies developed to other countries.

**Henry:** Well, we’re greatly looking forward to our Power Generation conference in Düsseldorf with Pöyry. Mike, is there anything in particular that you would like to have discussed around this topic at next month’s conference?

**Mike Wilks:** I think distributed energy is one key driver of future changes amongst a number but I think like some of these other drivers there is a real need to think about (1) how the future energy market will coordinate the activities of different stakeholders (2) how do we ensure that the benefits that can be realised at a society level, a country PLC level if you like, and (3) how will those benefits flow down to the parties that need to invest in those technologies. At the moment there’s a danger that the parties investing don’t get the benefits that trigger the investment in the first place.

So, I think that’s a key thing and therefore I’m generally in the space of “we need to start thinking now” about what appropriate market and regulatory frameworks are to ensure that distributed energy alongside other new technology development enables a secure and economic delivery of a low carbon energy sector.

**Henry:** Does that mean greater opportunities for aggregators to bring all these tiny little units together and operate them as a kind of virtual power station?

**Mike Wilks:** I think inevitably there are going to be new parties in this market, whether it be parties that are aggregating on behalf of smaller players to provide larger scale services, or whether it’s people managing the large data volumes to provide data-related services to different stakeholders, or whether it be some of the big names in ICT and telecoms coming in to provide some of the necessary communication infrastructure that will facilitate this smart energy market.

**Henry:** Well it’s a fascinating sector and you obviously know a huge amount about it Mike, thanks so much for talking to Platts today.

**Mike Wilks:** Thank you Henry.

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Pöyry’s Director, Stephen Woodhouse is one of the speakers at Platts 4th annual European Power Generation conference, taking place in Düsseldorf on April 22-23. In his session he’ll be questioning whether current policies are sustainable in the debate between liberalisation vs. decarbonisation.

Find out more about the event at [www.platts.com/europower](http://www.platts.com/europower).