Wind turbine data solutions for a digital age

Tiphaine Comby, Chief Marketing & Communication Officer at Sereema, looks at the growth of digital solutions in the wind industry and explains the benefits to be had from gathering independent data to monitor the performance and optimization of turbines.

PES: Welcome back to PES, Tiphaine, it's great to catch up with you once again. It's been a busy time for the wind market and I hope for Sereema too since we last featured your work?

Tiphaine Comby: I am happy to be back in front of real people, rather than in front of a screen on a laptop. And we can't wait to meet our clients in Copenhagen and Salt Lake City, as we are eager to introduce our new product line.

PES: With the industry as a whole developing at a very fast rate, how do you see digitization fitting in with this progress?

TC: All the players in the wind industry are turning to digital solutions because that is the only major leverage they have today, to get that extra margin to boost performance and extend lifetime, hence the yield from their assets. It's not surprising that in order to get that extra boost, owners need to get a better understanding of their resources.

Operators want to scale up their technical asset management while growing. Turbine manufacturers are developing their own digital cells internally, to keep up with their clients demands. Their pace is somewhat hindered by the fact that it's not their core know-how and they have to compete with digitally-DNA'd innovative companies.

Financial investors want to spruce up their portfolio pre- and post-acquisition, but a new trend seems to have arisen. That is controlling the asset management process to better drive their investment through performance optimization.

PES: How are some of the ideas from the world of IT now helping to inform how we monitor the performance and optimization of turbines?

TC: The tools needed to bring forth the full power of digitization already exist. Today, cloud stream data processing, storage capacities, big data mining and AI, already used in other industries and domains, are mature and can be applied to solve the wind industry's performance issues.

We don't face any technological barriers, but we have work to do to adapt the wind industry's 'analog' processes to embrace the digital era. Digital DNA companies such as Sereema already master these technologies. Adapting them is the core of our business and where our value proposition is.

PES: But these tools require data, lots of data.

TC: Indeed, the wind industry standard is SCADA data, but on its own, it's not sufficient to reach the real digitally-driven potential. Gathering data from multiple sources, combining different systems provides a highly efficient 'raw material' to feed those tools. That's why we decided at Sereema to generate our own independent data via the Windfit solution.

PES: How important is it, do you think, to have access to independent data?

TC: Independent data brings an extra layer, that add-on to complete operation, performance and maintenance strategies. Independence is a counter balance, constructive in its essence, federative in its application and disruptive in its technological innovation.

SCADA systems have always been more associated with maintenance than performance issues. Independent data sources enrich them with two objectives.

Firstly, they bring a level of precision unequaled by SCADA. High frequency analysis with Windfit for example, enables a ten times factor analysis and finetuning. It is of the utmost importance for us to be able to control the quality of the data, from generation to processing and analysis. The expertise of our results directly benefits from that higher quality.

Secondly, they invite an independent third-party to the operations table, and enhance the raw data with expert added value: reliable and unbiased.

Both aspects contribute to the value proposition offered by SCADA decoupled systems such as Windfit. Technicity and independence are the two significant added values brought by third-party solutions.

PES: How is independent data affecting the wind industry do you think and are we doing enough to embrace the opportunities?

TC: The challenge comes on several levels. Players need to define what kind of data they want to use. But then again, data for data is not important, the added value comes from the information extracted from it.

The potency of digital systems today lies in their ability to adapt the utility of the same raw data set to their very different users. Data is available for different purposes, teams and needs. The function of the data will vary, according to the operators' needs. They can be oriented to fit the actionable levers of asset management, finance, due diligence, maintenance, etc.

The various companies want different levels of information, extracted from the very same data. The added value is derived by delivering the best fit information for its users' needs.

PES: To get that unique data, a common drawback is the need to equip extra hardware on the turbine. Or am I mistaken?

TC: You're right, additional hardware is indeed a must have counterpart in order to generate independent data. At Sereema we made a point of sticking to this, because we believe in the power of our own generated data. Windfit data is controlled data and we are thus able to ensure its quality.

When Windfit was developed, keeping in mind that hardware would be unavoidable to the whole independent process, one of the main concerns was to keep it as non-intrusive and easy to install as possible. We wanted to steer clear of all the inconvenience of a Lidar installation for example, and designed a dedicated 500g, 30cm sensor box to minimize that hardware constraint.

Installing our equipment today takes less than an hour per turbine, with no structural changes made to the turbine, on-site technicians carrying the device in their backpack up to the nacelle and being trained online and supported on mobile during their intervention.

PES: Do you have any examples of the technology being used in the field?

TC: Since Windfit was launched in 2017, we've monitored more than 900 turbines in 15 countries, mostly in Europe and very recently in the US. We analyze data from onshore and offshore wind farms on a very diverse client fleet.

One of the advantages of Windfit is its agnosticity. So we actually have examples to show from the 14 WTGs brands and 70+ models we've already monitored. I selected a few illustrating this interview, but a more complete view can be found on our website.

PES: Will there be a way for turbines to self-adjust and not rely so much on human intervention?

Tiphaine Comby

TC: Soon enough, but the challenge lies in guessing whether the trigger for such evolution will be the 'market pressure', by which I mean wind farm developers and operators, or the perspectives given by the various technologies. It will probably be a mix of both and in less than a couple of years, depending on how digital technology adapts to the wind turbines. The machines will be able to interact, communicate and self-optimize.

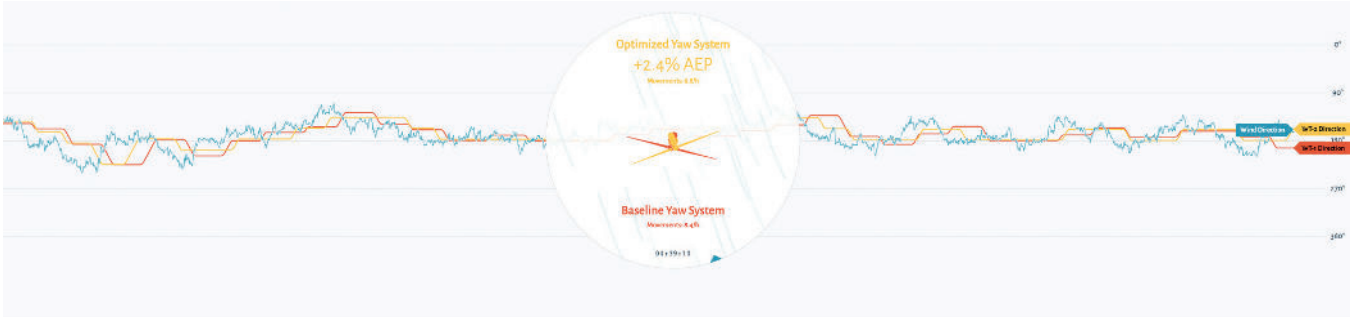
Beyond performance optimization, this will open up new operation strategies. For example, we will be able to densify the number of machines on a given site, reducing impact and tension on estate issues, significantly boosting revenue and profits, with lowered strain on locals.

I see this evolution in the wind industry as natural, but it also means adapting the machines so that they are digitally controlled.

PES: So O&M will play a key role in the process. Do you foresee digitization taking off in a big way imminently in this market? Are O&Ms ready to make the digital switch?

TC: Today, digitization is inevitable. It's not really a question of timing, because it's already happening. The question is at what pace?

In one of our previous pieces with PES, we compared wind with automotive industries. It's a good example when talking about pace. A decade ago, the first electric car manufacturer did not exist. In only 10 years, Tesla made it as the biggest stock market capitalization company in the automotive industry. More than 3 times the value of Toyota, 10 times that of Daimler, respectively ranking 2nd and 3rd. Whereas today, the Taiwanese company assembling Apple's iPhones, Foxcom, have developed and produced their own electric car models. Today none of the autonomous car technology leaders came from the original car makers club! However, it doesn't mean that 'historical' car makers won't succeed in



Fleet optimization will encompass new yaw digitally controlled strategy

developing autonomous cars in the future.

It's amazing how digitalization, at different levels, is a major game changer for many industries: space, health, finance. There's no way the wind industry won't be impacted too.

PES: Are you saying that new manufacturers could disrupt the market?

TC: I don't have a crystal ball showing me the future... but likewise digitization has a double effect for turbine manufacturers: opportunity on one side, threat on the other. Digitization speeds up the pace of new products entering the market, pushed by a new player... or a competitor.

PES: So, in the end, do you think digitization is fast-paced enough in the wind industry?

TC: There's an issue today that could slow down the digitization growth path. Actors bringing innovative digital solutions to the market have it in their hands to uphold and we need to be careful.

Credibility is of the essence here. Promises sold must be delivered. The whole digital community will be judged on this criteria. In the end, those solutions remain very technical and they can't rely just on the marketing. This is key, do not sell something that is not there yet, because it could and will discredit digitalization and slow down its progress.

PES: On a more personal note, what's your vision of the wind industry?

TC: To be honest, coming from the broadcast and press industry, with my background as a journalist, the switch to the wind sector was as much driven by environmental and civic concerns as by the dynamics and energy flowing. It is so refreshing and satisfying to be involved in accelerating the pace of the energy transition through digitization. A small step, but I'm very happy to contribute.

I won't lie, on the outside the wind industry seemed a little more stern than my previous experiences. But bonding over 'making the world a better place', as clichéd as it sounds, is proving to be incredibly worthwhile, on a personal level. I'm actually very proud to be working with Sereema's team and I'm taking this opportunity to thank all of them for embarking on this journey with me.

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