Overcoming challenges in scaling up technical asset management

Sereema is celebrating its 6th anniversary this year. PES thought it would be a good time to ask the CEO, Jérôme Imbert, to tell us about digital and asset management strategies from the beginning, how it is now and moving forward.

Six years ago, the wind industry was moving. Data was frustrating for everybody. SCADA data were available, and it seemed that the more data you had the better the control.

Yet, it took so much energy to make it speak that in the end the results were, and are still, often disappointing.

The asset management profession is changing

But then again, until recently the focus was mainly on financial optimisation, operational expenditure control and risk management. Controlling those parameters, provided that wind potential was at the expected level, was the standard to reach the yield provided by the business plan. There's a new deal on the table.

First, prices of wind energy have plummeted and the contractual margins have shrunk. The new types of contracts, such as PPAs, are also more demanding in terms of

guarantees to provide predetermined volumes of green energy... and compensations if you can't reach them. It calls for a deeper and prompt technical mastery at the asset manager level. To keep a high portfolio ROI, they need to be fully aware of the strengths and weaknesses of their asset as a whole:

- hardware: wind turbines

- power: wind resource assessment

- service providers: field operation teams, etc.

Second, a thriving wind industry shows the tussle for new energy market winners. However, growing fleet sizes, fast and hard, also comes with the responsibility of scaling up your technical asset management efficiently. Except that there is no rulebook by which management can standardize wind farms.

The sheer complexities of adapting to various geographies, turbine models, O&M contracts, sizes and data loads are already challenging. The consensus is there: 'the size of your team cannot expand at the same rate as the size of your fleet'.

Data was already frustrating then, especially so for asset managers. I witnessed first-hand the large volumes of information they treated on a daily basis, and at the same time, how blind they were about the real behavior of their wind farm. Sereema was born out of the desire to rise to this challenge. So, I put

together engineers, developers, field experts and laboratories to build a unique innovative IoT solution for the wind industry.

The Cloud

Eventually, everyone agreed that digitalization empowers strategists and drives operational performance of assets. The industry massively turned towards digital solutions for this reason: to cloud-based solutions, to be more precise.

The Cloud is the wall-to-wall concept about the way to connect, process and store data and services over the Internet. Cloud-based solutions provide services based on that worldwide infrastructure.

My Marketing Director would call it 'a fortunate stroke of serendipity for the wind industry, boasting scalability and ubiquity, to answer the challenges of both flexibility and growth'.

Let's have a closer look at the whole story.

Scalability

Growth trajectories aren't uniform in the industry. In our experience, accompanying various actors, from IPPs to Utilities, from green-to-be oil & gas to investors, benchmarking shows a x13 factor discrepancy between companies where one asset manager can supervise from 15MW up to 170 MW. One has to wonder, is it simply efficient manpower or the use of technology that allows different asset management strategies?

It's like with the music industry. Take your average wind turbine. It generates 3MB of data/day, equivalent to one track a day (128kbps in MP3 format). Some asset managers will listen to 5, others up to 57. The main point is increasing their music playing time while reducing their music management time. And the answer is: Streaming platforms like Deezer or Spotify.

In other words, the true scalable value in the Cloud lies in its flexible capacity to process, extract, analyze, store the data, allowing asset managers to focus on performance optimization, in a much simpler way.

As such, cloud-based solutions provide a system adapted to speed assets takeover in merger and acquisition transactions, quickly expanding, to facilitate technical data integration in existing workflow processes at lower cost.

Ubiquity

Your average-sized European IPP operates various capacities, assets ranging from a couple of turbines on the freezing coast of North America to wind farms operating under extreme heat and strong winds in southern Europe. The complexity of wind regimes, even more so when assets are spread out across the globe, make it very demanding for the asset managers to oversee simultaneously.

Plus, you're hardly going to climb up each turbine to check them, so you rely on data to guide your choices. And then again, diversification of turbine models leads to multiplication of knowledge regarding each specific one. Today, asset managers have to be flexible and continuously 're-educate' themselves to work efficiently.

All this explains why we see more and more Owners making the choice to invest in a cloud-based data storage, what one commonly called a data lake. Building up those big data lakes is not a problem anymore, only a question of budget.

Jérôme Imbert

Active Asset Management: closing the loop between asset managers and their assets

Instant access from anywhere, simultaneous work, sharing knowledge and experience, improving for the whole community no matter the location.

Managing complexity in data lakes

Anyhow, this is only the tip of the iceberg. One big issue remains: How to extract valuable, actionable Information. You don't want to turn the asset managers into Cloud experts. The added value of digital solutions dwells in their ability to transform the data to fit the asset managers' needs and help owners adapt their strategy to the fluctuating market.
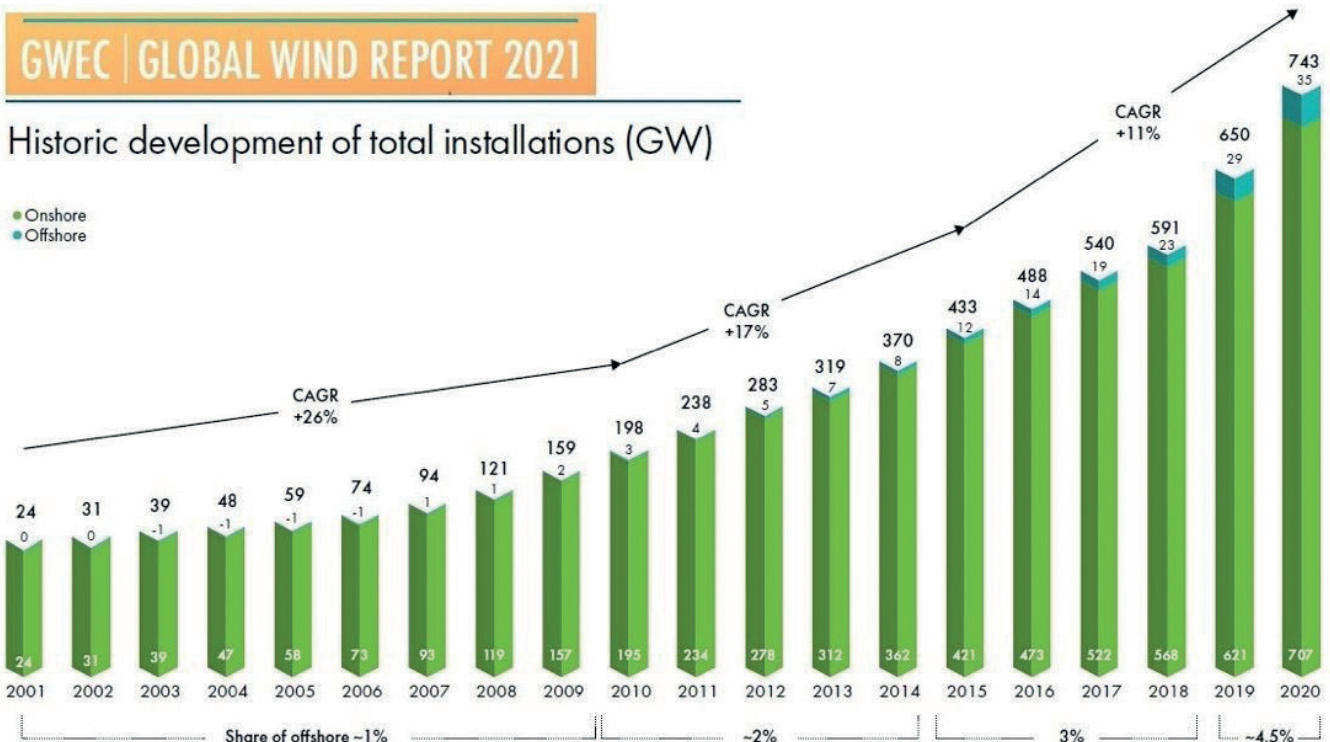
For all that, it feels the machinery is still yearning for an instrumental ingredient to turn data lakes into undeniable assets.

The urge is to empower asset managers with actionable data, turning facts into acts. Today, only a mix of cloud-based solutions existing on the market (internal/SCADA-based/independent) can fulfill the goal.

In reality, choosing from a stack of solutions for:

- High level asset management: reporting, through in-house developed tools fit to each customer's needs. Standard business intelligence-tools are sufficient, software already exist and don't need to be customized, no large investment necessary here.

- SCADA level data management: operation and maintenance focus-based. It would be preferable to have customized tools because of the specificities of each site and each maintenance strategy. Here again you can find acceptable software that can be adapted to design your ideal 2nd level SCADA data monitoring platform, but an effort needs to be made to analyse the technical results.

- Finesse level: precise and thorough info to provide actionable insights for decision making. In order to get the most from the wind farm you need to invest in specifically customized solutions which give you a substantial return on your investment.

The goal is to turn complexity into actionable results through the transformation of data into information. Windfit by Sereema, for example, makes the most out of cloud technologies to run on all types of wind turbines on 3 different continents, automatedly monitoring and processing about 80 MB/WTG/day to deliver its indications in no time.

'For all that, it feels the machinery is still yearning for an instrumental ingredient to turn data lakes into undeniable assets.'

The next step

One thing's for sure, every single MWh added will have more and more value in the future. It will be about short time reaction, downtime optimisation, fine tuning. Asset managers will benefit from a new generation of decision-making support tools, fully integrated into the wind farm information system.

Learning from local conditions, they will determine the patterns of behavior for each wind turbine and farm. Up to a point where the wind farm itself will adjust automatically within predefined limits for a first level of analysis without human action.

It will be closing the loop between the asset manager and its wind farm: a powerful combination of Edge (on-site) computing, internet network and cloud processing. It will give each wind turbine a layer of on-board intelligence.

Asset managers will choose the settings and let the turbine learn from its history then adjust to the best overall configuration for optimal operation, risk mitigation, output and productivity. We call it 'Active Asset Management' and we at Sereema are preparing it through the Windfit evolution.

About Sereema

Sereema is a Green Tech company aiming towards wind turbine operation and maintenance excellence. Windfit®, is its autonomous, all-inclusive digital solution to correct under-performing wind turbines and preserve lifetime while offering independent real-time monitoring on a user-friendly web portal.

Thanks to its Windfit-connected technology, Sereema provides peak services to optimize energy production and maintenance of wind farms. Sereema now supports over 1.8 GW of wind farms in 15 countries across the world.

For more information:

⌨ www.sereema.com

INSTALLED CAPACITY BY 2030

Share of wind in EU's electricity demand in 2030 (% of demand)

- 81 - 100%
- 61 - 80%
- 51 - 60%
- 41 - 50%
- 31 - 40%
- 21 - 30%
- 11 - 20%
- 0 - 10%

Wind power installed capacity (GW)

WIND ENERGY COULD COVER
29.6% OF EU'S **ELECTRICITY DEMAND**

FIGURE 3
Wind energy cumulative capacity installed and share of electricity demand covered by wind energy by 2030

Wind EUROPE