Know how to interpret data for true benchmarking

In the early days of the renewable-energy industry, data was seen as a problem. Scada systems collected more data than we could analyse, while service records and work orders (if they existed) were disorganised and difficult to manage and interpret.

Some years ago, as part of the Reliawind benchmarking project in the UK, a summer-placement student and I drove to a remote wind farm in Wales to get hold of information held in the project’s service records. We took out every individual handwritten page and laboriously photographed them. Then, over the following weeks, back in the office, we trawled through the images to interpret the handwritten technicians’ scrawl and entered the useful bits of information into a database.

The effort was worth it: the results were incredibly powerful and, possibly for the first time in the industry, we were able to objectively and robustly quantify the failure rates of the various components from a number of wind farms with different turbine types and operators. For example, we were able to prove what we’d suspected: that electrical components were starting to outstrip gearboxes as the major contributor to failure rate and downtime.

Things have moved on, and the industry is starting to see that rather than being a problem, data is actually an opportunity. Indeed, according to the much-hyped big-data fraternity, you can’t have enough data. If you can measure and collect everything, all you need is enough computing power and out drops your answer quicker than you can say “Hadoop cluster”. It may not be quite as simple as that, but the data is certainly becoming available.

**“How do you benchmark energy-weighted whole system availability when there’s no agreement on how to calculate energy losses or even how to define the ‘system’?”**

Benchmarking

There’s no doubt that being able to compare projects against each other is incredibly valuable. Benchmarking is used by companies to assess their operational excellence, evaluate strategy and check contractual prices. What asset manager wouldn’t want to be able to show their chief executive that they are doing such a good job that their reliability is outperforming other wind farms from the same OEM? Indeed, what chief executive wouldn’t want to be able to demonstrate to their shareholders or investors that under their leadership project costs are more competitive than the rest of the industry? Benchmarks have always been powerful, but now we are collecting enough data and have sufficient processing power to be able to make them meaningful and genuinely representative.

This kind of information can help investors looking at opportunities in wind to understand costs and evaluate percentiles to achieve the expected range of risk and opportunity. It allows operators to judge for themselves whether what their OEM tells them about how their project is meeting industry expectations, and assist owners in deciding on operations-and-maintenance strategy — should they go for the safety of a full-service agreement or do the reduced costs of self-operating outweigh the risks? Owners and operators use these results when evaluating O&M service provider bids, to estimate their own O&M cost budgets and to evaluate upside/downside failure and cost scenarios.

**Data for benchmarking**

Progress is being made in joint industry projects such as Sparta (system performance, availability and reliability trend analysis), in which UK offshore owners and operators are collaborating to submit data and allow performance benchmarks to be run. One of the challenges in industry collaboration projects is to ensure that all parties are speaking the same language. How do you benchmark energy-weighted whole system availability when there’s no agreement on how to calculate energy losses or even how to define the “system”? Common definitions, standardisation and collaboration can surely help. And for other industry stakeholders who aren’t willing or able to share their own data with competitors, there’s a multitude of commercial options.

So are we now in a world where our industry’s benchmarks are genuinely powerful? Unfortunately not yet. Having data is not the end of the story, because no matter how much you have, you must know how to use it and, even more importantly, how to interpret it.

The power of benchmarking can only be truly realised by knowing the reasons behind the trends, what is a real trend and what’s an anomaly, and what’s the root cause of outliers. Actually having real knowledge of the data: that’s when we can turn big data into smart data and make informed decisions that ultimately lead to higher project profitability.

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