

Unlocking the value of your project in an uncertain world

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As we come to the end of a turbulent year for the energy sector, there can be little doubt that renewable energy developers, owners and investors will continue to face high levels of volatility and uncertainty. This creates different challenges for development-stage projects and operational assets, but also represents an opportunity to unlock new value. More and more projects are seeking to complement basic PPAs with merchant trading and additional revenue streams such as balancing, ancillary services and power-to-X.



For operational assets, detailed knowledge of the current performance of each wind or solar farm is fundamental to unlocking their full potential. Reliable and up-to-date data is key to making the right decisions in these unprecedented times.

Understanding your project

Renewable energy projects generate vast and diverse volumes of data, ranging from high frequency sensor data sampling many thousands of times a second to long-term budget forecasts that set out annual cash flows. Typically, there is an inverse relationship between the value of data and the effort required to obtain, process and understand it.

The relative value is also highly dependent on the project and stakeholders involved and

simply spending time harvesting every available source of data can be extremely time consuming and may in fact be counterproductive. There is no point in financial decision makers becoming lost in status logs while site operational teams focus only on longer term horizons.

Considering a typical wind project, the key data sources are shown in figure 1.

A project review of how each of these data sources is being collected, if at all, and how much effort is involved is a critical first step. As part of this data review process, identifying which stakeholders are looking at each data source and how they are using data to support decisions is equally as critical. Having a team of experts with no data, or vast

quantities of data with no one to interpret and take action, are both scenarios to avoid.

Understanding the opportunities

Having created a full understanding of how a project is currently performing and being monitored, there are two opportunities for improvement. Firstly, optimising existing processes and decision making and secondly identifying new opportunities for optimisation and revenue generation. The first element can be achieved by the project team, but sometimes an external view can help identify blind spots or provide expertise that isn't available.

For example, forecasts will typically be delivered by an external forecast provider, but has the performance been reviewed against

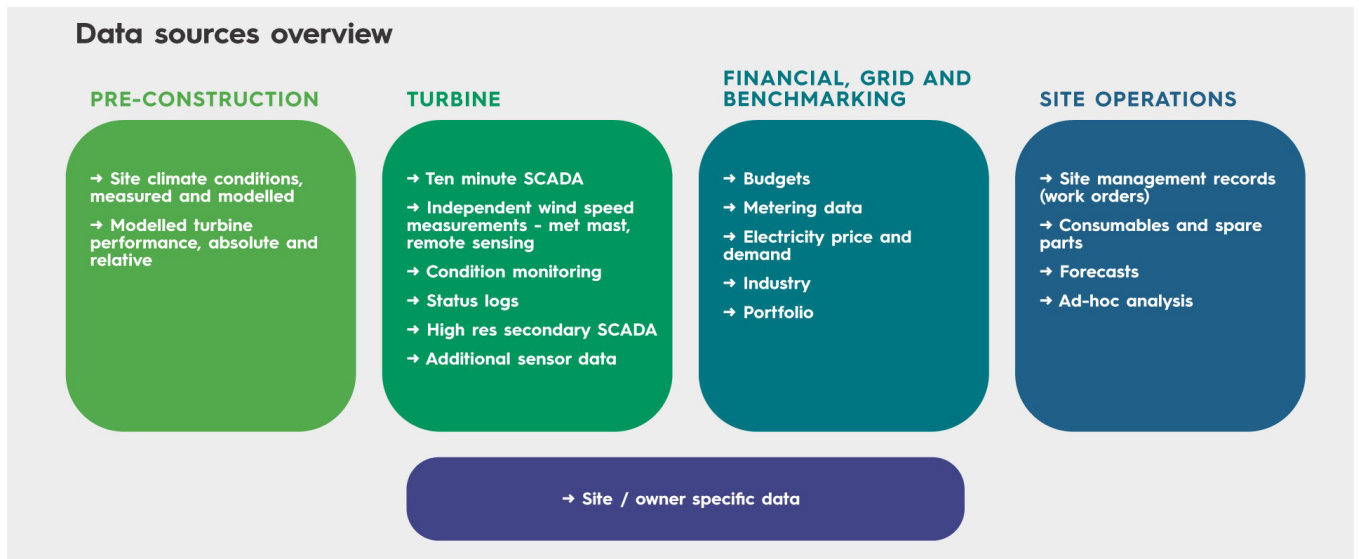


Figure 1. Typical data sources for wind project

their competitors, or has an investigation into enhancing the performance by supplementing with on-site data been considered? This could be a periodic or ongoing exercise and may require very specialist knowledge.

The key question, however, is not whether a more accurate forecast can be achieved, but what it means for the project. Benefits could include ensuring compliance with power purchase agreement (PPA) or subsidy scheme requirements; maximising merchant revenues as part of day-ahead trading and balancing activities; and enabling more effective scheduling of on-site works to minimise downtime and lost revenue, and ensuring maximum worker safety.

For many projects these will be realistic opportunities, but for some there will be no tangible benefit from the extra time and cost associated with detailed analysis and more value will be achieved elsewhere.

When it comes to exploiting new opportunities, this will typically rely on expertise from outside the project team. The expertise may be available in the wider organisation or again can be provided by relevant experts. Across mature and emerging renewable energy markets, there are increasing opportunities for renewable generators to proactively control their output in order to support the grid and maximise revenues.

Taking the UK market as an example, Natural Power is observing the following key trends.

Dynamic participation in the balancing mechanism

Historically, wind farms have typically set a fixed price at which they are willing to curtail their output and help solve short-term imbalances of supply and demand. However, the balancing mechanism has become more volatile, with some periods offering as much as £3,000/MWh. Battery storage projects are already taking advantage of these price spikes, and with the help of forecasts and accurate performance data, many wind farm projects could also increase their revenues.

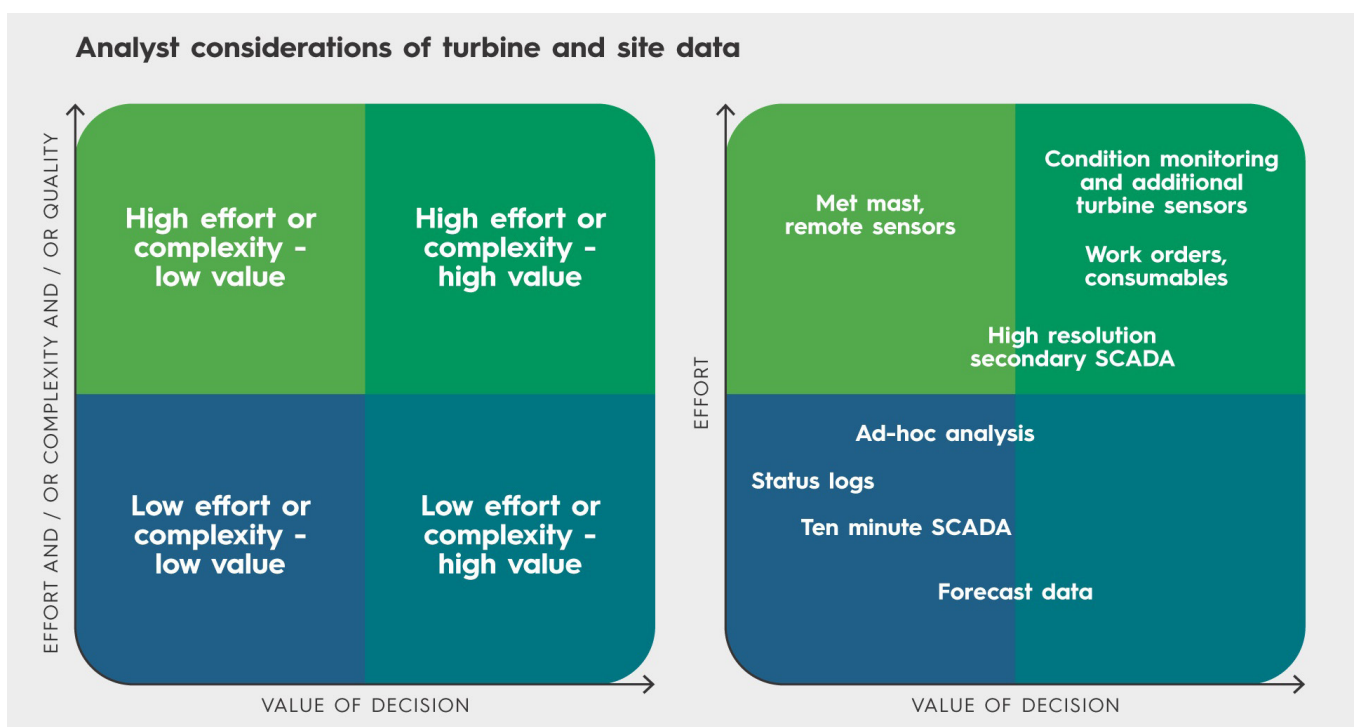


Figure 2. Decision matrix

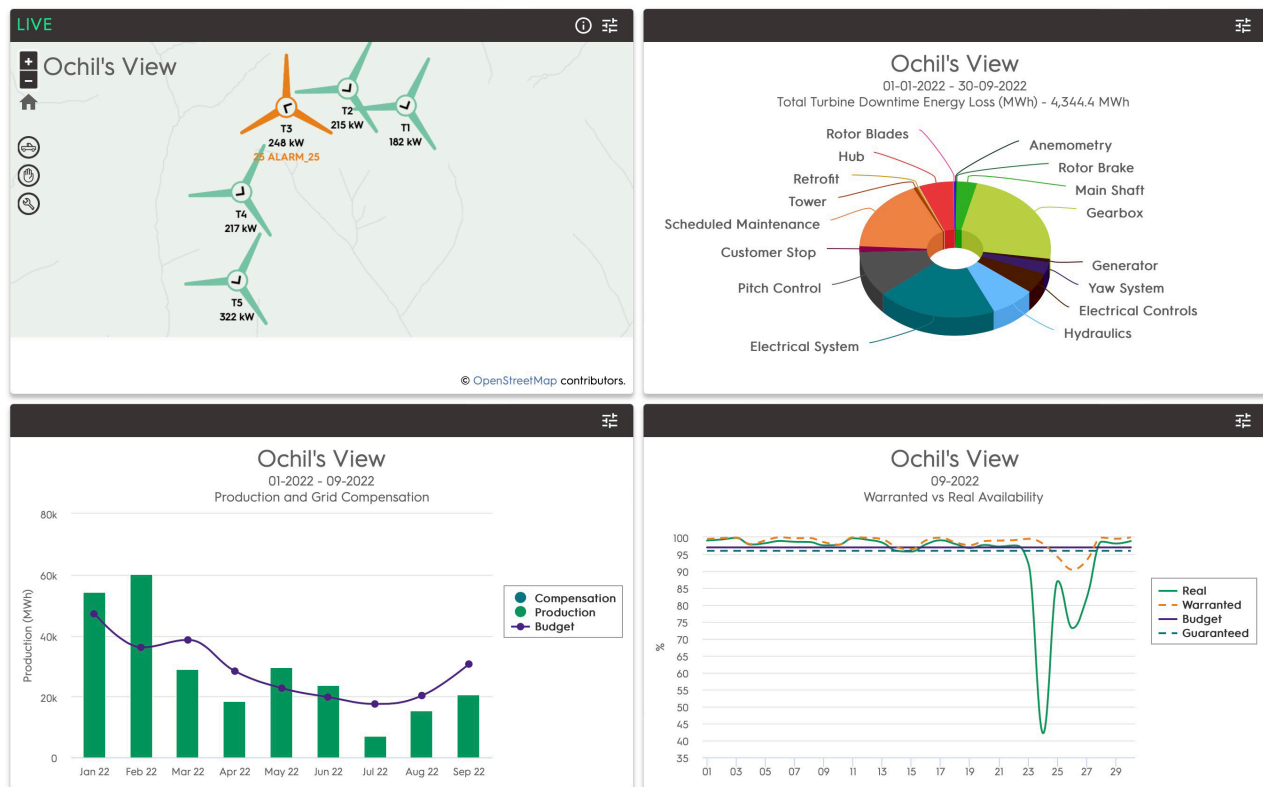


Figure 3. Performance Centre

Retro-fitting additional technologies to an existing asset

This includes battery storage, solar PV and green hydrogen, to create a so-called 'energy park'. This not only makes the most of an existing grid connection, but also allows more flexible dispatch of the renewable generation, which may be stored during periods of low pricing or curtailment.

Evolution of subsidy regimes

As of the latest CfD round, wind and solar projects are no longer topped up to the strike price during times of negative wholesale pricing. We expect that future rounds will feature additional incentives for renewable generators to align their output profile to the relevant demand.

Electricity market reform

The direction of travel points towards a decoupling of renewables and gas wholesale prices in order to lower costs for the consumer. While this will take many years to implement, it will result in significant changes to the business model for renewable energy projects.

Focussing efforts

Once the current state of a project is understood and objectives for optimisation are identified, the decision on where to prioritise can be carried out at the stakeholder level. This can be achieved by looking at the effort required to obtain the

data or enact a change in processes, and the estimated impact in a financial capacity.

An example of such a decision matrix, for an analyst at a wind project is shown in figure 2. Such a process ensures that the right person is focussed on the right area with the biggest return on time and cost invested.

There remains a last challenge however, with so many sources of data and different opportunities to improve performance, there is a risk of duplication of effort and tension between objectives. This risk can be mitigated through clear roles and communications and a single platform to communicate, share data and KPIs is key to facilitating this.

Continual improvement

Natural Power has developed a number of expert user systems and has more than 400 technical experts working on a huge range of projects covering all renewable energy technologies, and the complete lifecycle. For operational projects, we have created a single end user platform that can bring together data related to grid operations, asset management and analysis in our performance centre. An example of the performance centre dashboard is shown in figure 3.

Combining this with external data sources such as market price, weather forecasts and our advisory expertise can further help in the identification and prioritisation of resources. As well as more active participation in merchant markets,

the platform allows efficient tracking and resolution of site issues and automating reporting and communications.

This frees up asset managers, site operations staff and analysts to spend more time on improving project performance and operators can be proactive as new opportunities arise to explore new value from existing projects.

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About Natural Power

Natural Power is an independent consultancy and service provider that supports a global client base in the effective delivery of a wide range of renewable projects including onshore wind, solar, energy storage and offshore technologies.

It has a global reach, employing more than 400 staff across 14 international offices. Its experience extends across all phases of the project lifecycle from initial feasibility, through construction to operations and throughout all stages of the transaction cycle.

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