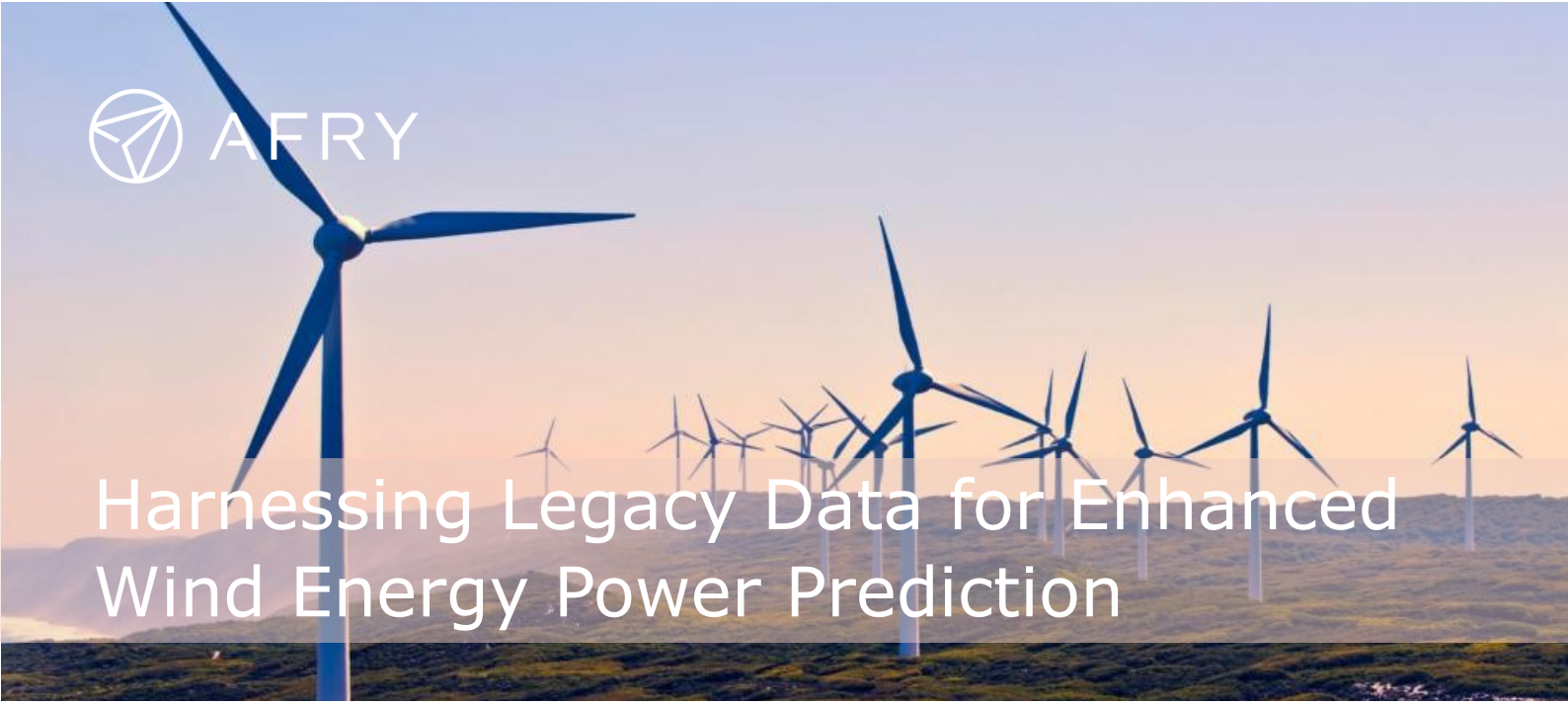


Harnessing Legacy Data for Enhanced Wind Energy Power Prediction

Integrating ML algorithms and digital twins to optimize wind turbine performance and get insights into operations.

INDUSTRIAL DATA ANALYTICS

This is the process of collecting, analyzing and using plant data to harness the hidden value. Tools like e-DAP are capable of modelling a physical phenomenon on the basis of data collected over time. The insight gained helps improve operational efficiency, optimize process, and plan maintenance ahead of time.

SITUATION & CHALLENGE

- Establish a digital control system to forecast power within days.
- Identify and explain deviations that might occur since the start of production, highlighting specific issues, their locations and interdependence.
- Enable predictive maintenance capabilities.

SERVICE & APPROACH

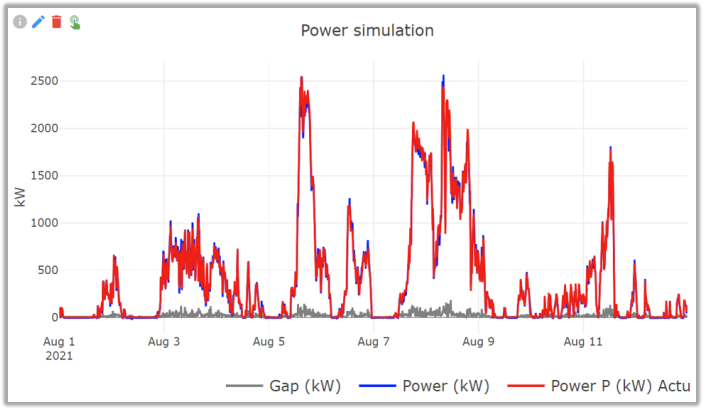
- An on-site survey of plants and infrastructure was conducted; legacy data was collected, ingested, and engineered (feature selection, windowing, PCA, etc.).
- The 5-year legacy data (wind direction and speed, blade angle, turbulence, orientations, etc.) was used to predict power.
- An online workflow was integrated into e-DAP, embedding the data-model, digital twin, and associated KPIs on a dedicated insight page.
- The digital twin was utilized to analyze production losses per turbine and determine other KPIs for future operational conditions.

E-DAP: the *end-to-end* data platform

A cloud-hosted infrastructure for the treatment of plant data: from IoT sensing, through engineering, dashboarding, ML/AI, digital twinning, to insight

IMPACT & ADDED VALUE

- The client now has on-line business intelligence tool for predicting the asset's health under defined KPIs.
- The client can now live monitor the operational/ production data from the plant.
- The client can act on the critical issues, and infer potential failure scenarios using real time data as input.



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