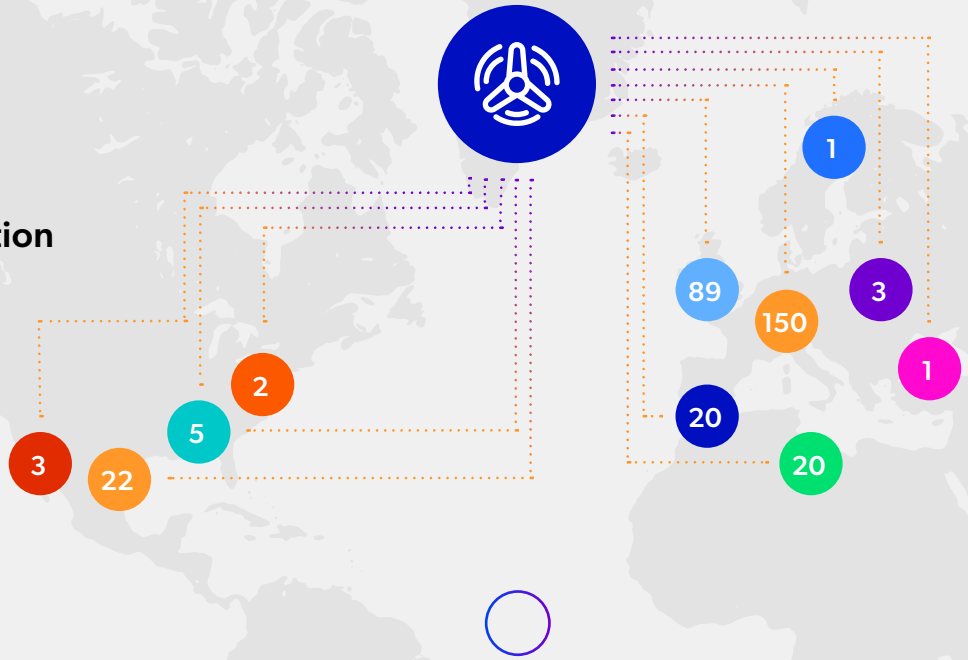
connectpoint

RWE

Improved Results Through New Technologies - A Digitalisation Approach

How did RWE Renewables transform its wind farms from decentralised to centralised data processing and control to realise data-driven optimisation and improve operating results?

ConnectPoint has continuously supported RWE in the digitalisation of its wind power plants.



About RWE Renewables

RWE Renewables, a subsidiary of RWE, is one of the most important global players in renewable power generation. The company operates more than 200 wind farms (including onshore and offshore wind farms) with heterogeneous structures in Europe and the USA. The total installed capacity is almost 13 GW. New sites are continuously added to the portfolio.

The challenges of energy generation from wind power

Energy generation from wind power comes with some challenges. One of them is the unpredictability of weather which complicates planning of the production of energy. Production must be reliably estimated and delivered as forecast to sell energy in the various markets. Deviations here lead to avoidable costs.

Data is vastly available for these forecasts, but it can only be used correctly if it is appropriately secured, processed, and merged. After this process, the data can be fed into efficient and self-learning forecast models that enable reliable and plannable cost-optimised electricity production.

Other critical factors for wind farms' management and cost structure are unplanned outages or comparatively decreasing revenues of individual wind turbines.

Wind farms, offshore and onshore, are maintenance-intensive, and even minor deviations from determined ideal conditions can lead to increased maintenance costs. The poorer performance of individual wind turbines can also lead to reduced, incalculable production results. Every wind turbine failure requires specialists and suitable weather conditions on-site. These risks can be reduced by predictive maintenance for the early detection of anomalies and problem diagnosis.

The need for RWE Renewables

With the development of IIoT, IoT and cloud technologies, expectations for the level of optimisation of wind energy production have increased. RWE Renewables aims to take advantage of the new technologies to improve efficiency continuously and, therefore, production results. Centrally acquired data is to be used to optimise all wind farms.

In the past, the data from thousands of turbines from different systems were collected and evaluated decentral in the various countries. The challenge was to combine centrally these different geographically dispersed data sources (turbines, sensors) with other technical and business systems.

Furthermore, the data had to be processed according to RWE Renewables specifications to be available for data-based decision-making, thus improving efficiency, reducing costs, and achieving business growth.

OSIsoft. Azure

The ConnectPoint solution

ConnectPoint worked with RWE Renewables to develop a system of available data on the market, weather forecast, and infrastructure conditions collected in the OSIsoft system to predict and optimise power generation for the next 24 hours in terms of profitability and efficiency.

OSIsoft is the world leader in real-time manufacturing plant data. OSIsoft PI served as the integration and data harmonisation layer in this implementation. The developed system allows the comparison of the performance of different turbine types from various manufacturers and locations in one central location.

ConnectPoint supplemented the data from the OSIsoft PI system with business and sensor data to provide a broad context for advanced analysis.

ConnectPoint built a central system for data analysis and real-time KPI calculations with a tool for managing measure data. This system also processed wind information from surrounding weather masts and fed it into the analysis. On top of this, ConnectPoint, together with RWE Renewables, developed an application for predictive analyses that exploit the Azure Cloud possibilities.

The data and analyses obtained are also used to improve daily maintenance and support engineering and service with a real-time overview of the operating status.

ConnectPoint developed applications for RWE Renewables such as:

- Control Room, a 360-degree view of production determining events in real-time,
- the Downtime Notification Tool, which provides information with instructions for action in the event of outages,
- the Access Manager, which manages physical access to the turbines for service personnel, and
- other various mobile applications for use in the field.

In addition, ConnectPoint developed applications for system maintenance, e.g., for monitoring the IT infrastructure.

The result was a centralised real-time system that saved many operational hours and enabled predictive data-driven maintenance, which significantly reduced repairs costs.

Data sources

- Production systems (DCS, SCADA) – wind turbines
- Asset data
- Market data
- Additional sensor and meter data
- Production forecasts
- Metmast data
- Other systems

Benefits of implementation

Today, RWE Renewables' strong partnership with ConnectPoint enables the smooth integration of new technologies into daily operations to increase efficiency and reduce costs. All production data is available centrally.

The summarised key benefits for RWE Renewables are:

01. The provision of results from the analysis of a large amount of qualified process data that comes directly from the infrastructure. These provide a sound basis for decision-making.

02. The early diagnosis of plant problems.

03. The real-time detection of anomalies in process data.

04. The use of an open platform that enables flexible adaptation to changing market conditions.

05. The use of scalable cloud technologies in building analytical systems and artificial intelligence to solve problems in industrial environments.

06. The reduction of data acquisition costs by centralising key process data in one place.

About ConnectPoint

ConnectPoint is a software and IT company that supports the process of digitalisation in the industrial, energy and public utility sectors. It specialises in the integration of IT/OT and IoT, combining industry knowledge with expertise in OT, Big Data, GIS, Business Intelligence and Machine Learning. The company develops systems that enable effective collaboration between operations, IT, and business.

Detected anomalies

- **Excessed temperature of the generator**
- **Wrong calibration of the direction of nacelle**
- **Deviations of braking force**