

## COMBINING ENERGY EXPERTISE AND PREDICTIVE ANALYTICS TO INCREASE PROFITABILITY BENEFITS

Renewable energy project operators face huge challenges in managing and analyzing the flood of data coming from their assets. They can spend lots of time and resources sifting through the data and still miss opportunities to optimize projects, identify and address underperforming assets, and prevent failures and downtime.

SparkCognition offers the world's first AI-enabled asset management platform for renewable energy. As a cloud-based SaaS platform that combines state-of-the-art AI/ML technology with deep domain expertise, the SparkCognition Ensemble Energy platform's predictive recommendations help optimize logistics, improve planning, perform condition-based maintenance, prevent failures, quickly identify underperforming assets, and ensure effective follow-through—all with the help of SparkCognition's experts.

Unmatched data analytics, asset management, and O&M planning tools are now all integrated into one platform with multi-asset renewable support that will soon expand beyond wind and solar into energy storage, hydro, and green hydrogen.

SparkCognition's extensive product-based solution portfolio can also offer energy providers a wide range of capabilities across their operations including prescriptive analytics to streamline work processes, total asset monitoring and analysis, advanced industrial cybersecurity, automated model building and forecasting, and AI-based energy market trading, hedging, and real-time P&L management.

The bottom line: SparkCognition's Ensemble Energy platform helps you improve profitability by increasing energy production, reducing maintenance costs, and maximizing operational efficiency.



## SparkCognition's Ensemble Energy Platform Delivers Bottom-line Benefits



### INCREASED REVENUE

Automated detection of underperforming assets helps increase energy production.



### FEWER FAILURES

Advanced anomaly detection and predictive analytics ensure timely maintenance action, minimizing component damage and reducing failure rates, costs, and downtime.



### OPTIMIZED PERSONNEL TIME

Analysts and technicians spend less time processing and managing data and more time working on solutions, resulting in improved outcomes.



### BETTER PLANNING

Visibility into future spare parts needs and advanced planning of crane callouts help avoid unnecessary costs.

## DESIGNED BY ENERGY EXPERTS FOR ENERGY EXPERTS

Designed from the ground up by energy experts for energy experts, SparkCognition's Ensemble Energy platform is a complete asset management and predictive analytics suite. We pair clean energy experts with top data scientists to create best-in-class predictive analytics models.

Our team members have deep experience in renewable energy project systems and component design—from blades and gearboxes to inverters and control systems. Our domain expertise spans controls, loads, electrical, mechanical, and more. This extensive knowledge is built into our platform and its recommendations. And when SparkCognition's Ensemble Energy platform identifies an issue, the SparkCognition team is available to assist in root cause analysis, then help you develop and implement corrective actions that save time and money.

SparkCognition's Ensemble Energy platform combines the power of data analytics with physics-based digital twin technology, resulting in the most comprehensive models with the highest accuracy and longest possible prediction horizons. By combining our deep operational expertise with the latest in AI and machine learning, the platform helps you maximize energy production, increase efficiency, and reduce cost.

## Platform Modules



OVERVIEW



MONITOR



PREDICT



ANALYZE



MAINTAIN



REPORT



### A COMPREHENSIVE SOLUTION

#### Overview

Get the big picture and view actionable alerts for fleet-level KPIs and operations.

- Energy production, capacity factor, and revenue
- Availability, both time- and energy-based
- Assets at risk, by component
- Downtime and lost energy events, by frequency and duration
- Maintenance costs
- Current site environmental conditions (wind speed, direction, temperature, solar irradiation, and more)

#### Monitor

Drill down to explore project and device-level KPIs.

- Alarms and alerts
- Fault and downtime by frequency, duration, and lost energy
- Maintenance costs
- Components with early-stage and advanced failure risks
- Site environmental conditions
- Extensive device-specific data
- Configurable dashboards

#### Predict

Combine SparkCognition expertise, physics-informed models, and advanced AI to prevent failures and reduce cost.

- Turbine power curve
- Mechanical components
  - Main bearings
  - Pitch system
  - Generator bearings
  - Hydraulic system
  - Gearbox
  - And more...
- Electrical components
  - Generators
  - Pitch motors
  - Transformers
  - And more...

### DELIVERING ASSET MANAGEMENT AND ANALYTIC POWER

#### Analyze

Turn data into valuable insights with extensive, intuitive self-service analytics.

- Generate time domain, scatter, fault, and downtime visualization plots
- Create heatmaps
- Plot and compare multiple turbines to quickly identify anomalies
- Use both preconfigured and user-defined analysis

#### Maintain

Increase the efficiency of operations, maintenance, and asset management.

- Easily track maintenance data
- Examine parts usage and maintenance cost trends
- Intuitively filter, plot, and export data based on any user query

#### Report

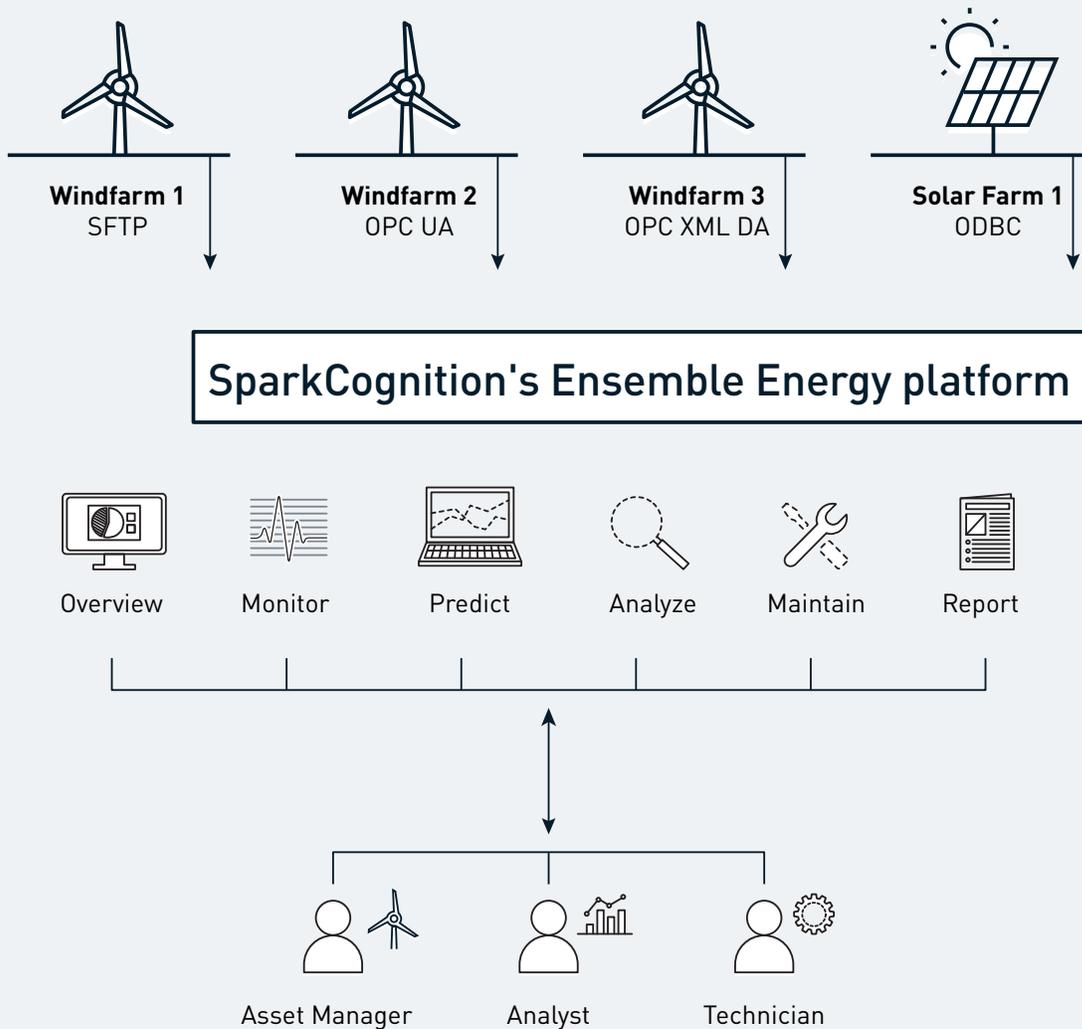
Automatically create standard and custom reports.

- Save time with automated daily, weekly, and monthly reports
- Create and save customizable report templates
- Use any data in the platform to create custom reports—including production, revenue, availability, fault data, maintenance costs and time, parts usage, and anomaly detection

# Network Connection Architecture

SparkCognition's Ensemble Energy platform can easily connect to wind and solar assets using SFTP, OPC, ODBC, or a SQL database—without the need for additional onsite hardware.

Data is encrypted, securely transferred from the site, loaded into our private encrypted database, regularly backed up, and placed in long-term storage for easy access at any time.



SparkCognition is helping clean energy project operators reduce costs, prevent failures, and increase energy production.

SparkCognition's Ensemble Energy platform combines advanced data analytics, AI, and our team's deep domain experience to increase analytics model accuracy and extend prediction horizons. Let SparkCognition's Ensemble Energy platform help you take your renewable energy project to the next level of performance.

Learn more at [www.sparkcognition.com](http://www.sparkcognition.com), or contact us at [info@sparkcognition.com](mailto:info@sparkcognition.com) for a demo.

## ABOUT SPARKCOGNITION

We catalyze sustainable growth for our clients throughout the world with proven artificial intelligence (AI) systems, award-winning machine learning technology, and a multinational team of AI thought leaders. Our clients partner with SparkCognition to understand their industry's most pressing challenges, analyze complex data, empower decision-making, and transform human and industrial productivity. Our vision is to build scalable AI solutions to solve the problems that matter most. We collaborate with organizations to help them reduce environmental impact creating a better, smarter, and more sustainable world. To learn more about how SparkCognition's AI applications can unlock the power in your data, visit [www.sparkcognition.com](http://www.sparkcognition.com).