

OPTIMIZE & REVOLUTIONIZE

How Asset Performance Management (APM) software enables renewables operators to balance power optimization and transformation responsibilities.



GE VERNOVA

03

FACILITATING PROGRESS

How renewables operators are transforming energy. ➤

04

The Solution:

APM

5 ways APM can help the industry balance optimization and transformation. ➤

07

A BRIGHTER FUTURE

How APM can be used to optimize solar PV generation. ➤

08

Case Study:

EVINY

How APM is supporting hydro assets. ➤

09

Case Study:

RWE

Providing value-based maintenance through digitalization. ➤

10

EXPERIENCE APM FIRST-HAND

How to book a demo of our industry-leading solutions. ➤

THE STAKES HAVE NEVER BEEN HIGHER.

For renewables operators on the frontline of the energy transition, the challenges are great. Meeting each challenge requires a myriad of balancing acts.

Operators must balance:

- The need for digital transformation to overcome financial uncertainty.
- Decarbonization efforts with growing demand for energy.
- The variability of renewables with the need for a consistent energy supply.
- Operating safely with operating profitably.

With asset performance management (APM) software from GE Vernova, all of this becomes easier.

Read on to learn how APM can help operators balance priorities and work toward a greener future.

THE BALANCING ACT ESSENTIALS



Optimize asset performance



Accurately predict renewable availability



Ensure effective and efficient maintenance

The Solution: **APM**

5 ways APM can help renewables operators balance optimization and transformation.

COMPOSABLE & INTEROPERABLE TO SCALE YOUR ENTIRE FLEET

Asset Performance Management (APM) from GE Vernova is a suite of solutions designed to help optimize asset performance and operations and maintenance (O&M) efficiency across equipment, the plant, and the entire fleet.

APM is OEM-agnostic, working with any asset on any OEM. It's even composable and interoperable to scale your entire fleet — including thermal generation.

The suite contains specialized solutions for various functions:

APM Health:

provides a clear view of the condition of your assets, including performance data and alerts.

APM Reliability:

delivers insight into asset performance, predictability, and trends to aid root cause analysis and ongoing improvements.

APM Strategy:

uses a risk-based approach to analyze assets, helping you develop and manage strategies.

APM Performance Intelligence:

is a point solution for fleets that combine renewable and thermal sources, empowering operators to reduce heat rate, fuel costs, and emissions.

APM Accelerators:

offer pre-built configuration templates for renewable assets that allow operators to shorten time-to-value.



5 WAYS

TO BALANCE OPTIMIZATION & TRANSFORMATION WITH APM

01

MANAGING WEAR WHILE OPERATING FLEXIBLY

When operators cycle between renewables and fossil fuels, this causes greater wear and tear on assets that may be being asked to perform under more pressure than intended. With GE Vernova's APM software, operators can monitor asset condition and identify potential issues before they become a problem.

By empowering mixed-fleet generators to operate flexibly to fill gaps when renewable generation fluctuates, they can ultimately decrease the reliance on fossil fuel generation for reserve power.

02

ENSURING AVAILABILITY

Demand for renewables can be unpredictable — and power demand is greater than ever before. This means optimizing availability is essential for giving people the power they need. With APM software, operators can ensure assets are performing as well as possible while mitigating unplanned downtime — all to ensure availability when it's needed most.

03

OPTIMIZING OUTPUT

APM offers operators three ways to optimize output, by:



Reducing downtime by dispatching maintenance teams only when they're needed.



Improving yield by identifying performance gaps and anticipating failure.



Increasing efficiency and reducing waste with condition-based maintenance.

04

HOW APM ENABLES CONTINUOUS IMPROVEMENT FOR REAL-WORLD PERFORMANCE:

One of the core functions of GE Vernova's APM is to drive continuous improvement and increase the reliability and availability of renewables. It does this through:

- Monitoring capabilities
- Productivity optimization
- Risk management
- Enabling predictive maintenance

05

HOW APM PROVIDES VALUE

By using APM, operators are realizing end-to-end value:

3-40%

EH&S incident reduction

2-6%

increased availability

10-40%

reduction in reactive maintenance

5-10%

inventory cost reduction

A BRIGHTER FUTURE



How APM can be used to optimize solar PV generation.

To effectively use Solar PV to meet energy transition demands, businesses need to ask themselves:

Should I monitor and maintain my solar assets like my fossil fuel assets? If not, how should it be done differently?

What critical assets need monitoring, and how do I know when issues justify dispatching a tech?

Can I benchmark the performance of multiple sites despite different configurations, health, and weather conditions?

What are my areas of greatest generation loss — and what can I do about it?

How well is my team optimizing site and fleet generation?

For operators striving to maintain optimum output, effective maintenance is essential. Many, however, are still using a time-based maintenance approach. This is a flawed approach. Operators could be spending time and resource on non-essential maintenance, simply because the calendar demands it. Other times, operators may struggle to identify asset degradation, risking long-lasting, off-cycle maintenance issues limiting generation.

With GE Vernova's Solar Accelerators and APM software, operators can accelerate time-to-value and improve maintenance tasks with condition-based monitoring.

Operators can achieve this by following three straightforward steps:

01

Visualizing asset hierarchy and health, contextualizing and prioritizing asset investigation based on hierarchy, health, and potential generation impact.

02

Integrating with fieldwork management, notifying teams of potential issues, then organizing an investigation, dispatching a tech, and documenting the work order all in one system.

03

Improving maintenance strategies, modeling production losses based on cause, events, and expected vs actual production, so that site teams can improve their maintenance strategies.

The outcome

LESS DOWNTIME

LOWER COSTS

MAXIMUM ROI



HOW APM IS SUPPORTING HYDRO ASSETS



CASE STUDY



Eviny needed a way to effectively manage assets across its 39 hydro power plants.

With GE Vernova's APM software, Eviny was able to find answers to questions from across plants:

- How can we organize maintenance efficiently?
- What work needs to be done — and when?
- How are machines performing are there any developing failures?
- What can we learn from past failures?

THE SOLUTION

Eviny chose GE Vernova's APM solution over competitors due to its ability to not only categorize and organize their asset data but also offer deep insight into how to act based on that information. This was all possible through APM's Strategy module.

Through APM's modules, Eviny was able to take a multi-track approach to asset management. It used APM Strategy to perform criticality analysis and asset strategy management. It used APM Reliability to continuously monitor signals from assets. Finally, it used APM Health to index health information from generators, turbines, MIVs, exciters, and transformers.



RESULTS



Eviny can now spend more time making an impact with a focused asset management strategy, empowered by data.



Eviny has been able to adopt a continuous improvement approach to managing its assets, learning from history.



Eviny has gained a deeper understanding of how its assets are performing — and where attention is required.



PROVIDING VALUE-BASED MAINTENANCE THROUGH DIGITALIZATION



CASE STUDY

RWE

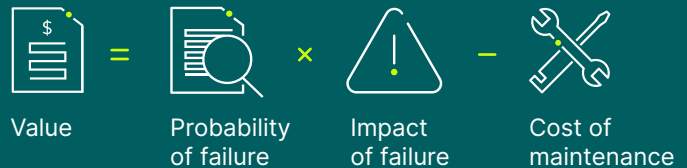
As part of its digitalization journey, RWE wanted to be able to prioritize equipment maintenance and make data-driven decisions to balance risk and commercial impact.

THE SOLUTION

RWE have ambitious goals to be carbon-neutral by 2040. To achieve these goals, it has established eight lighthouse projects. One of these is to adopt a value-based maintenance approach.

With SmartSignal from GE Vernova's APM software portfolio, RWE has been able to apply advanced algorithms to predict failure and its economic impact. With these predictions, maintenance plans can be optimized based on value.

By using SmartSignal, RWE was able to create a model for measuring the value of mitigated technical risk:



With this, RWE can achieve value through the following steps:

01

Predicting component health rate/failure probability/failure impact/risk level/work order prioritization.

02

Deciding whether to follow, defer, or prioritize maintenance based on value.

03

Achieving lower maintenance costs and higher plant reliability and availability.

RESULTS



SmartSignal identified a rising vibration from a Cooling Water Pump motor. By prioritizing maintenance, the vibrations instantly resorted to expected levels.



Replacing the motor could have cost \$1 million.



What if the vibrations were not addressed? Pump failure could have cost \$100,000 per day.



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EXPERIENCE APM FIRST-HAND

Today's renewables operators need to find ways to balance optimization with transformation. This is only possible with the right tools.

APM empowers operators to optimize asset performance and O&M efficiency across the entire organization.

To experience the power of APM first-hand, visit GE Vernova's demo hub.

Explore demos 