

# Deliver More Reliable, Affordable and Profitable Clean Energy

Renewable Energy Software and  
Automation Solutions from Emerson



  
**EMERSON**<sup>TM</sup>

# Optimize Renewable Portfolio Operations

The future of a more sustainable, decarbonized world is a reliable power grid and diversified energy mix where renewable energy plays a vital role.

At Emerson, we're working with global power producers every day to navigate these challenges and lead the transformation to a more intelligent power enterprise. The result is increased availability, optimized performance and reduced costs, all while helping to make it easier to manage a changing, diverse portfolio.

We are continually evolving our software to allow for growth in a disciplined, balanced way. Our adaptive technology easily scales from a single asset to an entire renewable portfolio, enabling secure and seamless integration into a smarter grid.

Our solutions turn data generated across the power network into valuable insights, and valuable insights into actionable intelligence. Moving from a reactive to a predictive and prescriptive approach helps enable faster data-driven decision-making, drives efficiencies and reduces costs.

By providing a holistic view with clear visibility and situational awareness, producers are better prepared for hard-to-predict events, resulting in more reliable, resilient and stable renewable energy portfolio management.

With innovative software and automation solutions, we see a future where renewable and reliable power is realized at scale, helping the power industry, as a collective, drive innovation that makes the world healthier, safer, smarter and more sustainable.



# Wind Energy

## Improve availability and extend operating life

Emerson has been a leader in wind automation solutions since 1969, with control designs for over 350 wind turbine models, compatible communication drivers for more than 750 wind turbine models and an installed base greater than 60,000 systems worldwide.

Our world-class power generation capabilities are amplified by innovative software, adaptive technologies and deep market expertise that optimize performance and provide unsurpassed reliability. Emerson's comprehensive, integrated wind solutions help you to expertly manage turbine and farm operations, enabling the delivery of low-cost energy to your customers and communities.

In addition to our broad portfolio of OEM technologies, we serve the fast-growing aftermarket segment by offering cost-competitive retrofit solutions that extend the operating life of your wind turbines and increase annual energy production

Every automation strategy is tailored by our team of wind experts to meet varying project requirements and can include wind turbine, wind farm or SCADA control retrofits, new asset management software, enhanced pitch and yaw control, load optimization and condition monitoring software.

## Results -

- **Maximizes annual energy production**
- **Reduces operations and maintenance**
- **Extends turbine operating life**
- **Increases availability**





## Solar Energy

### Real-time, reliable control increases energy production and grid stability

Photovoltaic (PV) solar installations are among the fastest-growing renewable energy generation sources around the world. With this growth comes a need for PV owners and operators to support grid stability with operational flexibility.

Emerson's software and technologies for solar PV sites provide an integrated, scalable control solution that helps to maximize kWh output and profitability while contributing to utility-grid and/or microgrid stability.

Features such as a flexible and scalable architecture, the use of standard communication protocols to aggregate data from field devices and enterprise systems, complete control scheme visibility and a comprehensive portfolio of security solutions and services help to cost-effectively achieve operational and financial goals.

Our solar PV solutions are expertly configured to address numerous challenges and provide positive returns:

#### Results -

- **Maximizes production while complying with grid interconnection agreements**
- **Actively curtails power output**
- **Minimizes the impact of variability and intermittency**
- **Increases kWh output while supporting grid stability**
- **Quickly responds to grid frequency events**

# Energy Storage

## Maximize value and return on investments by minimizing downtime

The world's increasing reliance on renewables comes with new inherent challenges from working with intermittent power sources, bringing into sharp focus the need for energy storage solutions, such as green hydrogen and utility-scale lithium-ion batteries, that can turn variable sources into reliable, dispatchable generation.

Improve the management of your energy storage assets using a purpose-built digital foundation from Emerson. Our software and technologies can manage the full green hydrogen value chain from renewable-supplied power, electrolyzer operation, energy storage and hydrogen-fueled power production. Our battery energy management systems enable safe operations and optimize charge and discharge for maximum production and lifecycle.

Emerson's energy storage management software optimizes operations and supports a reliable power system through energy arbitrage, load-leveling, grid services, reserves and black start or backup power. Our software gathers, contextualizes and securely delivers real-time and historical data to key stakeholders providing accurate, actionable intelligence that enables better decision-making and higher revenues.

Our flexible solutions are scaled to meet the needs of standalone storage systems or hybrid applications that include solar, wind and hydro, providing full operational visibility across all assets to increase performance, improve efficiency and reduce costs.



# Hydro Power

## Advanced digital solutions and dependable support from a trusted hydro expert

In today's competitive power generation market, hydropower plants play an important role in quickly and cost-effectively producing dispatchable electricity to the grid. However, aging plant equipment presents operating, maintenance and reliability challenges that may affect the commercial viability of these critical assets.

Emerson's scalable hydropower solutions modernize control systems and mechanical equipment, from a single governor to an entire fleet of hydro plants. The result is balanced, optimal power generation and water use that enables faster response to grid demands, reduced costs and adherence to compliance regulations.

Maintain reliable system operation with the support of Emerson experts who are experienced with all types and vintages of hydro governors. We proudly service over 1,250 hydro plants worldwide providing spare parts such as pins, levers, bushings, and analog control modules as well as PMG and SSG overhauls and governor oil pump repairs.

We also deliver customer-driven digital solutions using advanced governor algorithms, platform-independent controls, hydraulic power units, SSGs, servomotors and more.

### Results -

- **Enables safe and reliable operation**
- **Economically optimizes performance**
- **Increases operational flexibility, efficiency and responsiveness**



## Biomass Energy

The use of carbon-neutral biomass fuels as a strategy to help meet net zero goals while maintaining grid stability is increasing worldwide. As a reliable and dispatchable resource, biomass power can use existing plant infrastructures to fully replace or co-fire with coal.

Emerson's decades of expertise and experience in tightly controlling fossil-fueled generation enables accurate, coordinated and more efficient management of the highly demanding biomass boiler and turbine processes.

The result is safe, flexible and reliable operation of biomass power plants. Our solutions improved unit stability, responsiveness, and thermal efficiencies—helping to maximize availability and output.



## Geothermal

Geothermal generation, a low-cost, reliable and dispatchable renewable energy source, is projected to grow in areas with abundant high-temperature water or steam deep within the earth.

Whether your plant uses heat pumps, flashed steam, dry steam or binary, you require a control and monitoring solution that ensures your geothermal facility runs efficiently and reliably.

Emerson has successfully automated a variety of geothermal plant installations with a focus on balance-of-plant and turbine operations. Our philosophy of integrating a high level of process automation with tight process control ensures consistent, reliable operation resulting in fewer outages and extended maintenance cycles.



# Hybrid Renewable Power Systems

## Increase grid reliability by expertly managing integrated renewable energy generation and storage

The future of power requires integrated hybrid energy systems where renewable and traditional generation, energy conversion and storage technologies are combined to increase the resiliency and reliability of the grid while helping to balance the supply of clean electricity.

While the benefits of hybrid power systems are clear, bringing them to life is complicated. Integrating many data sources into one system and efficiently managing different generation and storage assets – each with its own control systems – is no easy task.

Emerson software and solutions for renewable assets provide a secure, purpose-built digital automation foundation with multi-vendor and multi-asset interoperability. Our automation platform is a single integrated source for capturing and contextualizing the massive amounts of data generated by renewable operations.

By providing greater visibility through a single, unified view of operations, Emerson software eliminates data siloes, complexity and risk. And as a result, it reduces costs, optimizes financial and energy performance across renewable portfolios and provides operators with more time to focus on driving results, instead of dealing with headaches.







## Ovation™ Green Software and Automation Solutions

### Increase production and deliver low-cost clean energy

Optimize renewable energy asset operations and improve annual energy production with Ovation™ Green: an innovative, reliable and robust portfolio of purpose-built software and automation solutions.

Emerson's Ovation portfolio leverages our industry-leading Ovation automation platform and deep power industry and renewable energy expertise. The new extension of our power-based control architecture focuses on the emerging green energy market, providing simplified renewables automation to help power producers build and scale sustainable operations.

Full access to real-time and historical operations information from the Ovation Green platform empowers owners and operators with greater visibility and control of renewable assets across the enterprise. Our data-driven solutions provide actionable intelligence that drives faster, more informed decisions to increase availability and reliability while reducing operations and maintenance costs.

We continually advance our software to evolve with rapidly changing technology and markets, allowing for growth in a disciplined, balanced way. Our adaptive technology easily scales from a single asset to a renewable fleet, enabling secure and seamless integration of clean energy into a smarter grid.

Backed by comprehensive, end-to-end support programs from a globally trusted advisor with local networks, Ovation Green software and solutions enable customers to increase production and deliver low-cost clean energy.

# Comprehensive Support

Optimize performance by supplementing your workforce with a team of global industry pioneers with local networks armed with decades of expertise.

Our expert resources can help you dependably define, execute and support an end-to-end lifecycle software and automation strategy for your renewable operations.

Partner with Emerson, a trusted adviser, to develop a comprehensive service and support plan that fits your renewable portfolio needs.

- **Consulting services** combine thought leadership, deep experience and leading technologies to solve high-stakes problems
- **Lifecycle services** provide the expertise, technology, and processes to operate safely, improve reliability and optimize your plant or equipment performance
- **Project services** provide a path to better project performance by reducing complexity, eliminating work and accommodating late change
- **Educational services** help increase your people's performance quality for better plant profitability and keep them up-to-date on automation technologies



For more information visit  
[www.Emerson.com/Ovation-Green](http://www.Emerson.com/Ovation-Green)  
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