EMERSON SUSTAINABILITY SOLUTIONS

Powering a Safer, Smarter and Sustainable Approach to Circularity

EMERSON

BEGIN EXPLORING

To advance an evolution of circularity, environmental stewardship must be an integral focus across operations.

Driver for Change:
Sustainability

Conversations around sustainability are now commonplace across industries.

With mountains of plastic waste negatively affecting communities and the environment, reducing plastic use and recycling are a growing priority for many people and organizations around the world.

In response to the impact of GHG emissions and plastic waste on the planet, the demand for sustainable chemical operations will continue to rise.

Circularity is more important than ever.

Safer

Safety is paramount across all operations.

Smart automation of software and instrumentation ensures high integrity and safety throughout operations.

Safeguarding Integrity, Efficiency and Productivity

Ensuring Operational Performance, Optimization and Security

SELECT ONE

SAFEGUARDING INTEGRITY, EFFICIENCY AND PRODUCTIVITY

Safe and reliable access to detection, diagnosis, prescriptive, mitigation and reporting technology are essential for operational integrity.

A range of conditions must be monitored and controlled ahead of potential equipment failure and environmental impact.

These conditions include cavitation, erosion, corrosion, outgassing, flashing, particulate buildup, high vibration, high pressures, high temperatures, extreme pressure fluctuations, and high fluid velocities.

OUR SOLUTION

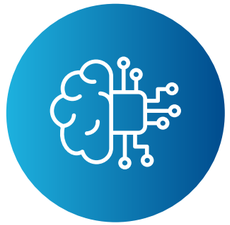
Emerson works with your operations and maintenance teams to activate energy-efficient solutions that extend service life of your operating equipment and achieve reliable and safe operations throughout a range of environmental and circumstantial conditions.

SAFEGUARDING INTEGRITY, EFFICIENCY AND PRODUCTIVITY

Prediction and protection for production assets is essential because unreliable equipment presents risks to safety, sustainability, and profitability.

- Top quartile companies had a 27% better safety performance (OSHA recordable incident rates) than the average switching from reactive to predictive technologies. (Source: Efficient Plant Magazine)
- The strategy to improving reliability and integrity of your operations is to manage both production and automation assets through Emerson's condition monitoring systems with protection capabilities that best fit the nature and criticality of your assets.

Use smart field devices



Modernize your machinery monitoring

Employ predictive diagnostic software

Collaborate with reliability experts

SAFEGUARDING INTEGRITY, EFFICIENCY AND PRODUCTIVITY

Challenge: Establishing High-Integrity Operations in Severe Service Applications

Solution: Detect critical process conditions to protect equipment integrity

These solutions combined are designed to prevent damage to operating equipment and reduce risk of environmental events.

Pressure and Safety Relief Valves

Emerson's pressure and safety relief valves are critical applications in exhausting over-pressurization to protect equipment and control upstream pressure of gas or liquid during refining and chemical processing.

LEARN MORE ↗

Rosemount 310C Corrosion Monitoring

The non-intrusive Rosemount corrosion monitoring devices and Plantweb™ Insight allows you to see problems before they occur without risking your employees.

LEARN MORE ↗

Aspen MTell®

Aspen MTell® provides early, accurate and comprehensive alert of potential equipment failure and recommended data-driven actions for management and mitigation.

LEARN MORE ↗

Challenge: Establishing High-Integrity Operations in Severe Service Applications

Solution: Activate a comprehensive set of solutions to operate in extreme conditions

A complete portfolio includes smart instrumentation, control, isolation and relief valves for various pressure and temperature applications.

Severe Service Control Valves

Severe service control valves are installed within the vicinity of harsh conditions around your process plant to maximize equipment longevity.

LEARN MORE ↗

Pressure and Safety Relief Valves

Pressure and safety relief valves protect against overpressure during changing conditions across a range of industries and applications, including chemical and process.

LEARN MORE ↗

Isolation and Shutoff Valves

Isolation and shutoff valves ensure optimal performance, safety, and equipment life for processes operating at maximum efficiency.

LEARN MORE ↗

Fisher™ ENVIRO-SEAL™ Control Valve Packing Systems

Fisher™ ENVIRO-SEAL™ Control Valve Packing Systems are compliant with the Clean Air Act and provide an exceptional stem seal to prevent loss of process fluid and control emissions.

LEARN MORE ↗

ENSURING OPERATIONAL PERFORMANCE, OPTIMIZATION AND SECURITY

Challenge: Establishing High-Integrity Operations in Severe Service Applications

Solution: Give operators safe and remote access to diagnostics

Smart instrumentation, operations software, advanced control systems and asset management tools simplifies data collection and analysis while safeguarding critical assets through continuous monitoring and protection capabilities.

DeltaV AgileOps™ Software

Emerson's DeltaV AgileOps™ software is configured for the process state to monitor operational performance and provide consistent reporting on performance analytics, operational limits and safety integrity.

LEARN MORE ↗

Aspen DMC3™

Aspen DMC3™ ensures optimal performance and reduction in energy usage with adaptive process control technology embedded with artificial intelligence, increasing controller uptime through real-time analysis during remote monitoring.

LEARN MORE ↗

ENSURING OPERATIONAL PERFORMANCE, OPTIMIZATION AND SECURITY

Challenge: Establishing High-Integrity Operations in Severe Service Applications

Solution: Verify functionality and emergency readiness of critical devices

Scalable automation platforms like a Safety Instrumented System (SIS) integrate control, safety and proof testing, partial stroke testing, reliability maintenance and production reporting.

Digital Valve Controllers

Emerson's digital valve controllers accomplish partial stroke testing while a valve is online to determine any dangerous failures and confirm that the valve is not stuck and is capable of moving into a safe position.

LEARN MORE

Fisher™ Digital Isolation™ Solutions

Fisher™ Digital Isolation™ solutions are the final control element within the Safety Instrumented System and supplement additional security.

LEARN MORE

Safety Sensors

Emerson's safety sensors certified to IEC 61508 diagnose and ensure very low numbers of dangerous failures for pressure, temperature, flow, level, tank gauging and flame detection.

LEARN MORE

Smarter

Chemical plant operators are optimizing project execution with effective project strategies throughout plant life cycles.

Digital solutions streamline workflow processes and enable project reliability, efficiency, and certainty.

PROJECT APPROACH & MANAGEMENT

Extensive projects require collaboration with the right digital tools and technologies to maximize scale and success.

Strategic automation delivers a vital impact on the overall economics and schedule of a project.

Several factors must be considered when executing and managing your capital project.

- Cost
- Complexity
- Change
- Collaboration
- Automation
- Long-term operational objectives

OUR SOLUTION

The intersection between Emerson and AspenTech project service expertise and portfolio of automation solutions are well-positioned to deliver market-leading asset performance, reliability, safety, and production.

An exhaustive strategy for project management ensures that your capital projects are on-time and on-budget, capturing top-quartile performance with automation, value, and quality.

Emerson provides a holistic approach through Project Certainty for successful project execution. Through expert partnering, this ensures delivery of reliable solutions that eliminate costs, reduce process complexity, and accommodate need for agility to improve productivity and profitability. This results in a range of benefits:

50-60%
reduction in hardware design steps

80%
elimination of hardware/software FAT hours

90%
elimination of system hardware and loop drawings

30-50%
reduction in engineering hours

15-25%
shorter instrumentation and control schedule

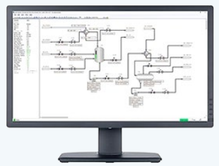
30-40%
reduction in total installed costs

LEARN MORE

Challenge: Scaling and Ensuring Project Success from Pilot to Production

Solution: Employ a strategic combination of smart instrumentation and software solutions to maximize productivity and efficiency and reduce project risk.

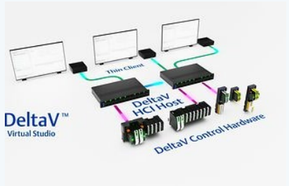
These solutions are designed to streamline project workflows and meet market demands and trends.



Digital Twin Solutions

These solutions upskill personnel through operator training and enable advanced testing and foresight through dynamic simulation of potential environments that may impact equipment and processes.

LEARN MORE ↗



DeltaV™ Virtualization Solutions

These solutions reduce hardware footprint and ensure high availability and automatic disaster recovery.

LEARN MORE ↗

Aspen Fidelis™

This reduces project risk through comprehensive techno-economic optioneering and system analysis.

LEARN MORE ↗

Smart Commissioning

This is Emerson's automation-based approach to streamlining commissioning of field instrumentation, connected to a DeltaV™ Distributed Control System and AMS Device Manager asset management software.

LEARN MORE ↗

Industrial Wireless Technology

Wireless technologies can lower your installation cost, speed up commissioning and simplify the addition of equipment at a later date – ultimately cutting speed, risk and cost out of the project.

LEARN MORE ↗

Sustainable

Digital automation solutions are reducing the environmental impact of hydrocarbon-based production of polymers through circular and energy-efficient practices.

SUSTAINABLE

Critical purity standards and energy efficiency are optimized through sustainable Solutions.

SELECT ONE

RECYCLED PRODUCT PURITY

Plastic Waste

Carbon emissions are widely addressed by many corporations in their climate targets, but another critical issue that must be part of these conversations is plastic waste.

Thanks to its unparalleled versatility, plastic is used in countless applications across diverse industries today.

However, over 99% of plastics are produced from chemicals sourced from natural gas and crude oil, and plastics manufacturing results in greenhouse gas emissions.

Source: Center for International Environmental Law

The world is generating 400 million tonnes of plastic yearly, and 85% of single-use plastics end up in landfills or dumped in the environment.

Source: United Nations

RECYCLED PRODUCT PURITY

Recycle And Reduce Plastic Waste Along Value Chain

Today, less than 10% of plastic is recycled and reused.

Global and business trends from consumers and organizations are driving significant demand to increase circularity.

That’s why Emerson aims to achieve zero waste to landfill by 2032.

RECYCLED PRODUCT PURITY

Plastic pollution is harming global ecosystems and must be mitigated through circular collaboration across chemical recycling and repurposing of used plastics that retain a high standard of quality and purity.

Promoting circularity throughout the industrial plant process yields a range of impact.

- Recover materials at the end of the product lifecycle to be reused in production.
- Reduce introduction of additional carbon and waste to the environment.
- Reduce plastic production costs, time, and energy.
- Expand use of recycling innovation technologies to reduce impact of unrecoverable plastics and promote a closed-loop circular economy.

OUR SOLUTION

To foster plastic waste reduction across industries, Emerson is enabling partners to integrate circularity and maintain purity standards through industrial automation, diagnostic, control, and supply chain optimization solutions.

RECYCLED PRODUCT PURITY

Chemical Recycling is a major step in the right direction when creating a truly circular plastic economy.

1

DISSOLUTION

This process starts with dissolving single-use plastic, such as sorted trash, with a corresponding solvent.

2

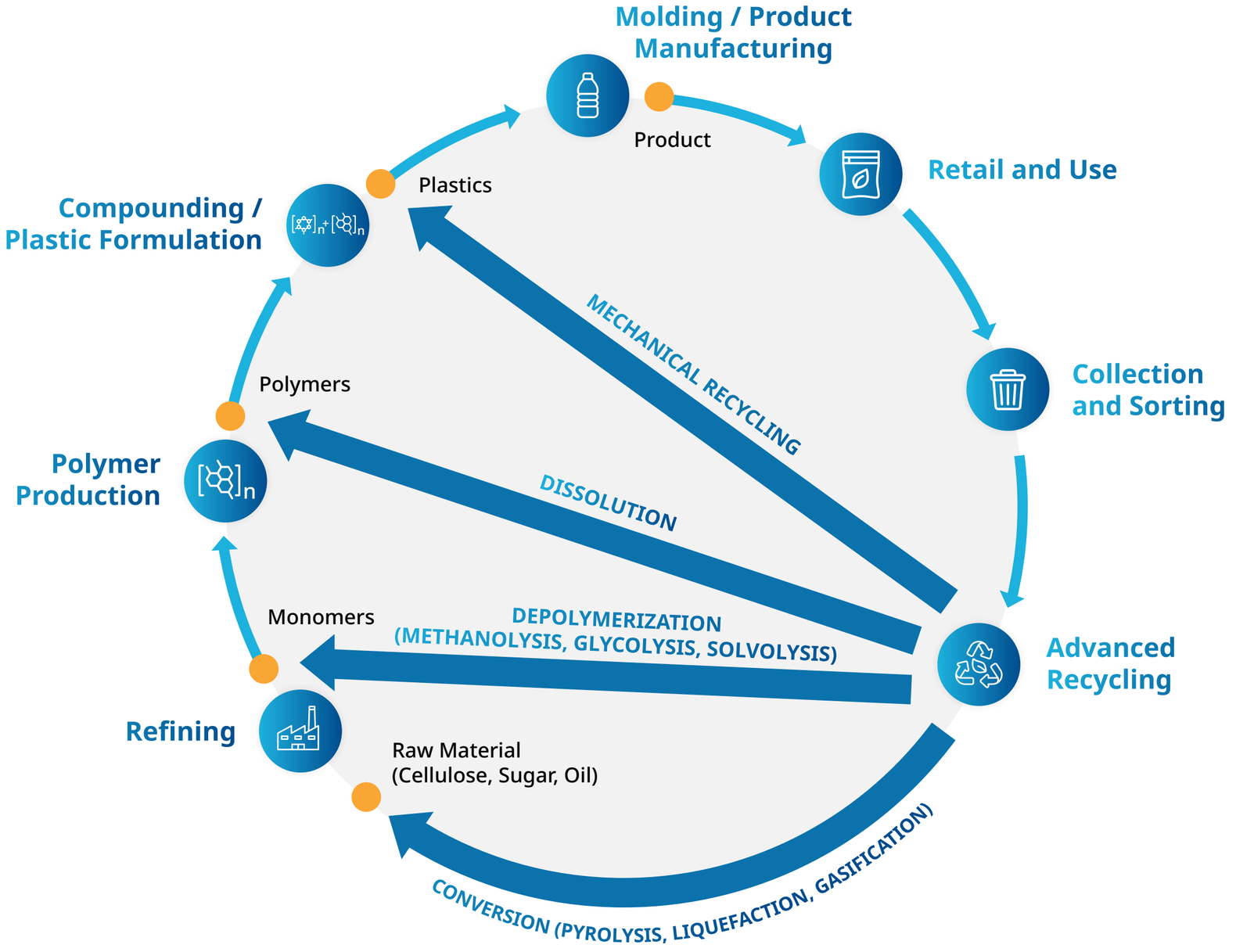
DEPOLYMERIZATION

The single-use plastic is converted from a polymer to a monomer, making it possible to remove contaminants while in liquid form before it undergoes the re-polymerization process and is reused to produce high-quality plastics.

3

CONVERSION

Mixed trash is loaded into a process converting plastics into a variable feedstock, which then, through pyrolysis, converts the waste into raw chemicals for the production of new plastics and polymers.


Molding / Product Manufacturing
Product
Retail and Use
Collection and Sorting
Advanced Recycling
Raw Material (Cellulose, Sugar, Oil)
Refining
Monomers
Polymer Production
Polymers
Compounding / Plastic Formulation
Plastics
MECHANICAL RECYCLING
DISSOLUTION
DEPOLYMERIZATION (METHANOLYSIS, GLYCOLYSIS, SOLVOLYSIS)
CONVERSION (PYROLYSIS, LIQUEFACTION, GASIFICATION)

Challenge: Ensuring Recycled Product Purity

Solution: Maintain critical purity standards with solutions that supplement chemical recycling and ensure process efficiency, consistency, repeatability and quality.

These solutions boost integration of circular strategies throughout chemical operations.

Coriolis Flow Meter

Emerson's flow measurement solutions enable improvement of reactor and distillation efficiency by reducing waste, improving quality of the final recycled product and optimizing material and energy balance.

LEARN MORE

PACSystems™

PACSystems offers a scalable and affordable approach to the industrial control and automation landscape, allowing production optimization and monitoring capabilities in the widest range of process and discrete industrial environments.

LEARN MORE

Fisher™ FIELDVUE DVC

This digital valve controller device ensures accuracy of process set points through diagnostics and two-way communication.

LEARN MORE

DeltaV™ Automation Platform

These systems and software solutions are embedded with advanced control to to provide steady asset control and maintain operational efficiency, production flexibility, and product quality.

LEARN MORE

Challenge: Ensuring Recycled Product Purity

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These solutions boost integration of circular strategies throughout chemical operations.

Aspen Plus®

Integration with Emerson's **Real-Time Modeling System**™ offers real-time simulation of polymers, feedstock, and sustainability processes to refine process conditions, anticipate and plan for variability, foster circularity, and optimize production.

LEARN MORE

AspenONE Supply Chain Management

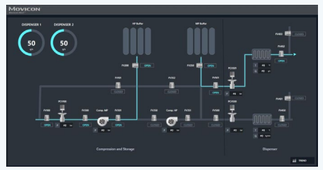
Optimize supply chain network for recycled feedstock integration to align production requirements with collection and distribution planning to meet timing and profitability targets.

LEARN MORE

PACEdge™

Integration with DeltaV™ distributed control system, PACSystems and third party devices provides visibility into plant process productivity, performance and energy consumption data with real-time analytics to activate fast, real-time action.

LEARN MORE



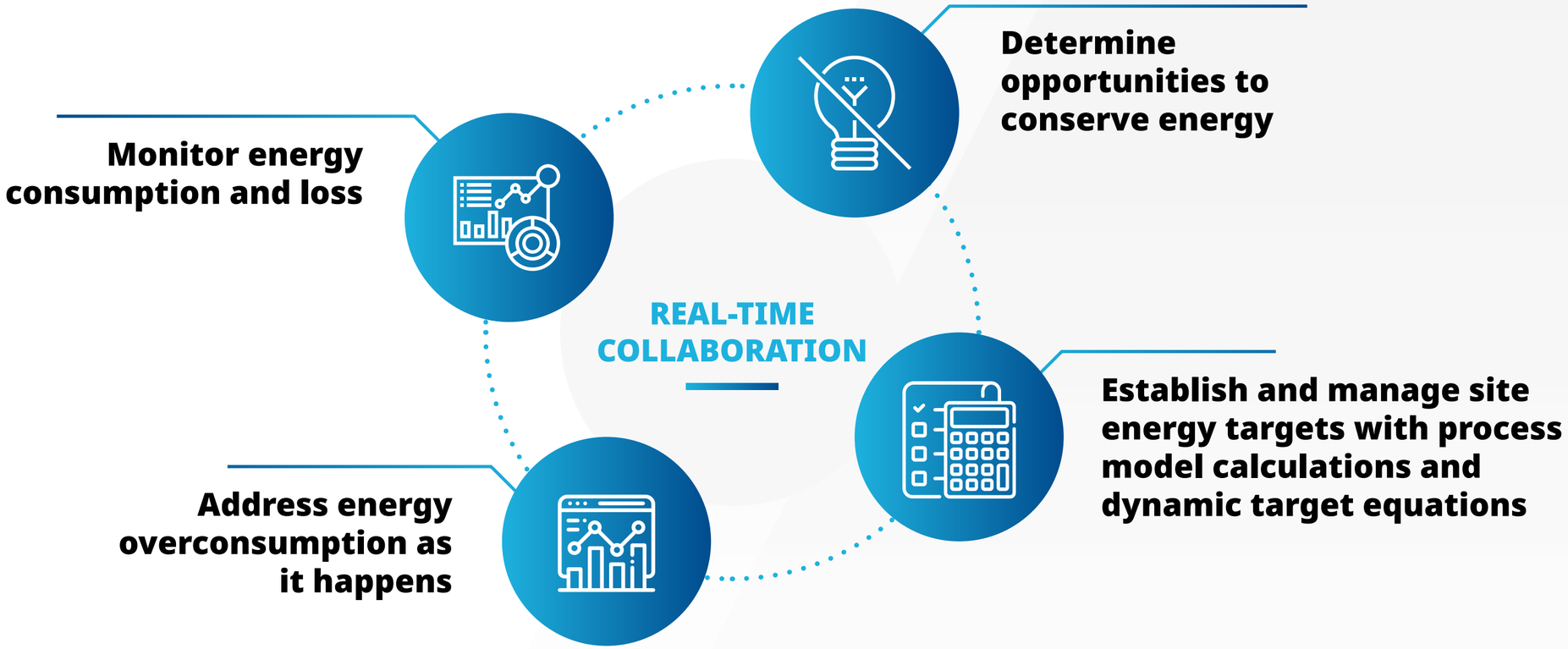
Movicon.NExT™

This software technology enables automation engineers to significantly increase the efficiency, quality and flexibility of their projects — at any scale.

LEARN MORE

Reduction of energy usage and emissions is accelerated through investment in energy-efficient strategies and technologies.

Manage site energy performance and lower energy intensity with real-time information.



ENERGY & EMISSIONS MANAGEMENT

Energy efficiency is key to addressing climate change. Resource management and efficiency is vital to ensuring process stability and lower energy intensity as we transition to a low carbon future.

Manage and reduce industrial emissions through digital solutions designed to optimize use of energy sources.

- Detect and prevent flame, gas, and leaks.
- Optimize combustion processes and control efficiency.
- Implement continuous, real-time monitoring and analysis of energy data.

OUR SOLUTION

To drive the global shift to clean energy, Greening Of, By, and With Emerson is strategic empowerment of customers' environmental sustainability performance through implementation of net zero solutions in essential industries for decarbonization, energy & emissions management, and circularity & waste management.

Challenge: Ensuring Environmental Stewardship Through Energy & Emissions Management

Solution: Ensure health and safety of people and environment through comprehensive technologies.

These solutions are designed to promote combustion and control efficiency with an effective analysis of fired heater performance with measurements and data.

DeltaV™ Advanced Control & Analytics Solutions

Integration with Aspen DMC3™ and Rosemount™ Flame and Gas Detection safeguards, controls, and optimizes operations with top-level performance, reliability, and quality.

LEARN MORE ↗

Coriolis Flow Meter

This measurement tool delivers exceptional accuracy and reliability of critical flow measurements for assessments of challenges and anomalies in fluid conditions and environments.

LEARN MORE ↗

Variable Frequency Drives

Emerson's family of VFDs optimizes motor speeds to match power demand and minimize energy costs. Its compact size and high current rating makes this suitable for production of recycled products.

LEARN MORE ↗

Rosemount™ 6888A In-Situ Oxygen Analyzer

This device optimizes plant efficiency and reduces energy costs through analysis of oxygen within flue gas in harsh process conditions.

LEARN MORE ↗

Rosemount™ Flame and Gas Analyzers

Integrated emissions monitoring and safety calls for effective measurement of flame, gas and combustibles to monitor releases at chemical plants.

VIDEO ↗

Challenge: Ensuring Environmental Stewardship Through Energy & Emissions Management

Solution: Control steam distribution and reduce steam production maintenance and energy costs.

These solutions are designed to promote combustion and control efficiency with an effective analysis of fired heater performance with measurements and data.

DeltaV™ Advanced Control & Analytics

This solution enables reliable monitoring, control, and management of operational performance, efficiency, and sustainability.

LEARN MORE ↗

Yarway™ Steam Trap

The thermodynamic, thermostatic, and mechanical traps execute steam trap operations and improves minimization of steam loss.

LEARN MORE ↗

Rosemount™ 8800 Vortex Flow Meter

This tool enables accurate and optimal measurement of steam with fewer leak points for improving the overall energy usage and balance.

LEARN MORE ↗

Rosemount™ Steam Trap Acoustic Steam Trap Monitoring

This tool monitors the condition of your steam traps preventing lost steam, wasted energy and reducing emissions.

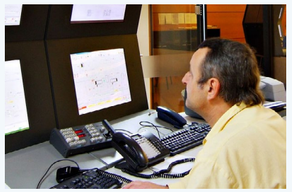
LEARN MORE ↗

Challenge: Ensuring Environmental Stewardship Through Energy & Emissions Management

Solution: Ensure proper energy usage and efficiency throughout operations with utilization of detection, optimization, and management solutions.

These solutions are designed to conserve energy and minimize emissions.

Optimal throughput and energy efficiency are generated with built-in control performance diagnostics and process control.
These solutions are vital in the prevention of polymer over-purification and reduction of energy consumption and costs.



DeltaV™ Automation Platform

Integration with Aspen DMC3™ enables operational optimization and reduction of energy usage through real-time monitoring and analysis.

LEARN MORE ↗

Fisher™ FIELDVUE DVC

This device streamlines troubleshooting and accelerates response to detected critical issues.

LEARN MORE ↗

Rosemount™ 3051S

This solution, when paired with Advanced Diagnostics, prevents distillation column flooding.

LEARN MORE ↗

ENERGY & EMISSIONS MANAGEMENT

Challenge: Ensuring Environmental Stewardship Through Energy & Emissions Management

Solution: Ensure proper energy usage and efficiency throughout operations with utilization of detection, optimization, and management solutions.

These solutions are designed to conserve energy and minimize emissions.

Plantweb™ Insight

Improved monitoring of known problems around heat exchangers, pressure relief valves, steam traps and pumps is crucial in reducing wasted energy and emissions.

LEARN MORE ↗

Fisher™ ENVIRO-SEAL™ Control Valve Packing Systems

These systems play a role in eliminating energy emissions through unprecedented sealing capabilities.

LEARN MORE ↗

Aspen Polymer Scheduler

This tool reduces scheduling costs up to 40% and minimizes product waste and energy usage through sequence optimization algorithms and asset visualization.

LEARN MORE ↗

Closing the loop on sustainable operations calls for the right partner. Emerson is uniquely positioned to provide the right products and services to solve complex environmental challenges.

Power a Safer, Smarter, Sustainable Approach to Circularity

GO BOLDLY ↗

EMERSON

BACK