



**Rockwell  
Automation**

# Results Achieved: Drive sustainability

The 3 key elements of data-driven sustainable operations







# Sustainability initiatives deliver business value both today and tomorrow

Addressing environmental impact is top of mind for organizations around the world, especially in the industrial sector. Industry consumes nearly 40% of global energy and produces more than 30% of global greenhouse gas emissions—and regulators are mandating change.<sup>1</sup>

While these numbers are significant, they also represent **an enormous opportunity to innovate and optimize industrial operations**. By collectively taking steps to evolve, industry is poised to play a leadership role in creating a more sustainable future for the planet.

## Invest in sustainability to drive financial outcomes today

Sustainability investments are not only a business imperative, but also deliver economic benefits. As an example, 42% of manufacturers cite improving efficiency as a top reason for pursuing sustainability initiatives.<sup>2</sup> Similarly, almost 50% of executives reported that their environmental sustainability initiatives measurably boosted corporate financial performance.<sup>3</sup>

## Start with what you have and achieve quick wins

It's valuable to think big when it comes to sustainability, like transitioning to clean energy sources and redesigning products. And it's equally important to consider tactics that make a difference in the short term.

For example, your current **automation solutions are likely a key enabler for reaching your sustainability goals at scale**. It starts with harnessing your sustainability data from these systems to gain insights.

With these insights, you are better equipped to make changes that deliver faster ROI and accelerate ESG progress.

“Our view on sustainability is that it's got to be connected. Productivity and sustainability need to be one. And the key to that is the integration of systems leveraging the same data for both productivity and sustainability. It can't be a standalone system by itself.”

– Tom O'Reilly  
VP of Sustainability  
Rockwell Automation

1. World Economic Forum: Net-Zero Industry Tracker, 2022.

2. 2022 Rockwell Automation State of Smart Manufacturing Report.

3. Deloitte. “2021 Climate Check: Business' views on environmental sustainability.”

# Progress starts with visibility

## Data: the foundation for reaching sustainability objectives

At Rockwell Automation, we believe progress towards sustainability goals starts with **contextualized data from your operations today**. This belief is grounded in our experiences partnering with leading organizations to optimize production and achieve results using data and insights from sources like industrial automation solutions.

## What's next in this guide

We'll discuss the three key elements of data-driven sustainable operations:

1. Maximize your existing investments
2. Automate actions based on data and insights
3. Scale across the enterprise and value chain

Following each element are examples of how Rockwell Automation customers are making progress towards their sustainability goals.

"Sustainability efforts have to be data-driven to drive a reduction in waste, a reduction in energy and to improve processes."

- Tessa Myers

Senior Vice President, Intelligent Devices  
Rockwell Automation





## Maximize your existing investments



### The idea:

Tackling sustainability and productivity goals in your operations starts with data. The good news is **you may already have relevant data available to help drive progress and results.**

Understanding the data you have now will help you build a better roadmap and avoid unnecessary cost and complexity in your operations. While you may need future investments, keep in mind that there is value to unlock in your operational technology today.



### What this unlocks:

Knowing the data that's possible to obtain from existing solutions helps maximize the value of your investments and is also a starting point for:

- Baseline and reporting on data
- Identifying areas of opportunity
- Tracking progress towards goals

These data then inform an actionable plan for process improvements. For example, once baseline energy usage is established, patterns can be uncovered, paving the way for improved ESG reporting and reduced consumption. Not only does this kind of initiative address sustainability goals, it supports efficiency, savings and productivity objectives as well.



# 46%

Percentage of manufacturers that said they lacked **the ability to use data to make decisions** when asked what they needed in order to outpace the competition<sup>4</sup>

4. 2022 Rockwell Automation State of Smart Manufacturing Report

## Maximize your existing investments



### What this involves:

**Take a closer look at your automation solutions.** Review the data they create and collect and assess how the data can be used for sustainability (and productivity) purposes. Consider working with an automation expert, as they may be able to conduct this review on your behalf.

You likely already have sensors and machinery in place that provide production efficiency data, or readings on your energy usage. And it's possible that you may need a few more sensors to obtain the data granularity that's required. But in most cases, your existing equipment has an important role to play as a source of sustainability-related data.

For example, **existing industrial control and automation hardware and software can often double as energy data sources**, providing energy data contextualized to production data at the site, area, line and machine levels. When these data are contextualized and integrated across your operations, it can help shed light on broader resource impacts, such as the energy consumed in water-intensive processes. It can also support critical business needs such as emissions reporting.

**Evaluate whether key data are quickly visible and available for analysis.** In certain cases, there will be work to do around optimizing how data are surfaced, modeled and aggregated. Regardless of your current state, building a picture of sustainability-related data from your existing solutions will help you get the most out of what you already have, and identify gaps to prioritize investments.







# 379k tons of carbon saved\*



## CHALLENGE

- Reduce energy consumption and therefore carbon emissions from a mine's surface ventilation systems
- The ventilation system for each shaft was powered by two large fans directly coupled to two induction motors—one fan ran at a time, while the other was on standby



## SOLUTION

- Optimized control of fan speed and air circulation with Rockwell Automation Powerflex® 6000T variable-speed drive technology
- Rockwell Automation and Energy Drive delivered an innovative energy-savings-as-a-service partnership to reduce emissions and deliver energy savings at the mine throughout the duration of the contract



## RESULTS\*

- 379k tons of carbon saved**—equivalent to removing 5000 homes in South Africa from the grid every month
- 62% energy savings** in the first shaft and 48% in the second with a third to commission in 2023

[Read the full story](#)

\*Anticipated savings over the 10-year contract term once upgrades are fully implemented



**Sibanye**  
Stillwater

we are one  
**ENERGY**  
DRIVE





# 3% reduction in energy consumption



## CHALLENGE

- Reduce energy consumption per barrel injected (kW-hr/barrel)
- Increase water injected into reservoirs by 1% to increase oil recovery and maintain a consistent oil production rate



## SOLUTION

- Installed PlantPax® Model Predictive Control (MPC) technology on 35 injection pumps and 3 pool transfer units and pads
- This created greater stability and operational continuity, and eliminated losses associated with low pool levels



## RESULTS

- 3% reduction** in energy consumption
- Increased water injection by **2.4%**, meaning an additional **548 BOPD (Barrels of Oil Per Day)** could be extracted

[Read the full story](#)



Latin American  
oil and gas producer



## Automate actions based on data and insights



### The idea:

Addressing sustainability goals starts with access to contextualized and trusted data for monitoring and reporting.

After data are contextualized and trusted, the next step is to optimize by automating actions based on these data and advanced algorithms. Technologies like machine learning (ML) and artificial intelligence (AI) can **guide your control system responses and reveal continuous improvement opportunities**.



### What this unlocks:

Automating actions based on data and algorithms takes you from process improvement to **performance optimization**. On a day-to-day basis, process variables and resource consumption are fine-tuned so that only what's needed is used.

With ML and AI, **systems can dynamically adjust processes in real time based on predicted conditions**, boosting efficiency and making it possible to achieve sustainability and productivity goals at scale.



# 4%

Potential reduction in worldwide greenhouse gas (GHG) emissions by 2030 with the use of AI<sup>5</sup>

5. PwC Report, "How AI can enable a sustainable future"





## Automate actions based on data and insights



### What this involves:

**Assess your advanced analytics capabilities.** You may already have tools for modeling and uncovering actionable insights from your data. And if there is a gap, keep in mind that adding in ML and AI capabilities could be simpler and faster than deploying new hardware.

**Identify high-value use cases for predictive insights.** For example, algorithms can be trained to predict energy consumption of a particular line, machine or component, making it possible to detect anomalies and set up rules for corrective action triggers. Similar modeling can be done to predict a host of other scenarios, such as when equipment maintenance will be required or when chemical injection setpoints need to be changed in water treatment operations.

**Connect to control systems for automatic improvements.** Using algorithms in concert with automation systems unlocks a new level of optimization. Consider a smart water pressure management scenario, where pressure fluctuations are predicted and proactively managed in order to mitigate leaks and improve reliability.

Advanced process control solutions, which provide an intelligence layer on top of an automation system, are designed for this purpose. These solutions continually assess current and predicted data, compare that data to desired results, and proactively drive changes. This makes it possible to **automatically reduce process variability and optimize resource usage.**





# 2,200 kilowatt hours saved per day



## CHALLENGE

A water/wastewater treatment facility needed to:

- Improve efficiency and optimize aeration basin performance
- Conserve energy
- Reduce chemical use
- Reduce operational costs



## SOLUTION

Developed and installed an AI-enabled control system that continuously monitors and learns the current state of operations and optimally adjusts PID response as conditions change for best performance

Remotely programmed an AI application on an Allen-Bradley CompactLogix™ 5480 controller and installed it on the existing automation network

Optimized aeration performance, reducing ammonia bleed-through and staff intervention



## RESULTS

2,200 kilowatt hours saved per day

Reduced annual energy and chemical usage resulting in over \$100K in savings

[Read the full story](#)







# 30% reduction in variability\*



## CHALLENGE

- Minimize specific energy consumption by minimizing product waste
- Increase utilization of the line to maximize plant profitability
- Maintain productivity and improve product consistency



## SOLUTION

- Collaborated with Rockwell Automation's Kalypso consulting services to implement an ML solution to predict anomalies
- The solution predicts key quality attributes using soft-sensor models to help operators proactively maintain the process within specifications
- Maximized plant reliability and productivity, and reduced waste and energy consumption



## RESULTS\*

- 30% reduction in variability, resulting in improved quality
- 20-30% reduction in product losses

\*Anticipated results once solution is fully implemented



European  
food company



## Scale across the enterprise and value chain



### The idea:

A data-driven sustainability approach must ultimately scale across the **full product lifecycle and value chain**.

It starts with gathering and contextualizing data from your operations and ecosystem. It also involves automating actions to move from performance improvement to performance optimization. This forms the basis for driving holistic, scalable improvements.



### What this unlocks:

As sustainability reporting continues to mature and as products evolve, adaptation will be critical. Having a quality stream of data allows your operations to adjust to regulatory compliance requirements and emerging needs.

Combining analytics and AI solutions with automation helps you **reduce cost and carbon at the same time** without impacting your market positioning or pricing.

With these capabilities in place, optimizing for sustainability becomes not just a production focus, but instead an ongoing business process at scale. **Setting up optimization efforts now enables you to drive larger initiatives that support a more sustainable world.**

“Information needs to be used in the right way, so it can take manufacturing to new levels and enable us to co-innovate and invent the future with our customers.”

- Cyril Perducat

Senior Vice President & Chief Technology Officer  
Rockwell Automation





## Scale across the enterprise and value chain



### What this involves:

**Set up data and analytics capabilities for scale.** Progress towards a more sustainable operating model across the value chain starts with creating steady streams of actionable data to drive insights and improvements in resource usage—starting with a single machine, then scaling. Next is analyzing and modeling the data and gleaning insights to drive improvements in resource usage—starting at a single line level, then scaling up to cover an entire operation.

**Establish an operating system for continuous improvement.** The process of uncovering digital sustainability insights and driving changes is the basis for closed-loop improvements. A fully automated continuous improvement approach requires IT/OT convergence, enabling a digital thread of data across every stage of production—and ultimately across the entire value chain. This seamless flow of data creates a holistic understanding of resource usage and fuels a collaborative approach to improvement and optimization.

**Connect sustainable production with sustainable product management.** Driving continuous improvement at scale means addressing operations and product objectives holistically. This involves changes such as:

- Implementing a fully digitized product lifecycle management (PLM) system
- Creating digital product passports
- Using digital twins for sustainable product design

**Ultimately, it's essential to link sustainability goals to overall company strategy.** Digital investments are not simply business imperatives—they are a key part of creating a more sustainable future.





# 20% OEE improvement

via data-driven decision-making, improved enterprise collaboration and standardized processes



## CHALLENGE

- Improve data accuracy
- Increase production capacity
- Reduce unplanned downtime and increase OEE
- Accelerate decision-making
- Facilitate enterprise-wide collaboration
- Avoid new facility CapEx



## SOLUTION

- Collaborated with Rockwell Automation, Kalypso, Microsoft and PTC to:
- Automate data collection
  - Enable enterprise-wide integration
  - Enhance visibility with IIoT
  - Implement real-time performance dashboards
- Enabled actionable insights from plant floor to enterprise level



## RESULTS

- 20% OEE improvement, without building a new facility

[Read the full story](#)







# 20% increase in per-capita output\*



## CHALLENGE

Optimize lithium battery production operations to meet growing demand and support the energy transition



## SOLUTION

Helped identify priority areas to transform manufacturing capabilities and implement changes through smart manufacturing and AI-driven technologies



## RESULTS\*

- 20% increase in per-capita output
- 20% reduction in manufacturing costs
- 67% reduction in the ramp-up cycle

\*Anticipated results once solution is fully implemented in 2023



**SVOLT**  
蜂巢能源

# Why partner with Rockwell Automation on your ESG journey?

Sustainability is a top focus at Rockwell Automation. We are a sustainable partner committed to helping our customers and our ecosystem achieve ambitious sustainability goals.



## Connected Enterprise®

**Smart manufacturing is the gateway to digital transformation.**

We bring it to life through the Connected Enterprise, which unites and integrates information technology (IT) and operational technology (OT).

The result is a digital thread of information that spans the entire value chain—a seamless flow of data that opens new windows of visibility, enables better and faster decision-making, and securely connects people, processes, and technologies to deliver growth and expand human possibility.

## Extensive partnerships

**No company can tackle global sustainability challenges alone.**

That's why we're passionate about partnering with organizations across the globe to build a network of problem solvers, builders and innovators expanding human possibility together. Our PartnerNetwork™ of OEMs, SIs, digital specialists and tech partners drives innovation and helps you maximize the value of your Rockwell Automation investments.

## Results achieved

**Success isn't measured in promises, it's measured in results.**

We have an extensive track record of proven results in helping customers drive sustainability. Each number — whether it's energy savings, or reduced carbon emissions — stands as a point of proof that working together, we can help customers optimize production to drive efficiencies and achieve their sustainability goals.

## Commitment to safety and security

**ESG comprises not only environmental stewardship, but also the safety and security of people and operations.**

As the number one supplier of machine safety solutions, we're well-positioned to help customers invest in the safety of their workforce. We also deliver unrivaled capability in OT cybersecurity, protecting your critical assets 24/7 with specialized in-house cyber knowledge coupled with world-class partnerships.

## Sustainability consulting expertise

**Actionable, data-driven strategies are powerful accelerators of sustainability progress.**

We enable companies to design, develop and deliver products more sustainably. Our sustainability consulting services are tailored to each customer's maturity and goals. Together, we craft a strategy that combines innovation practices and digital technologies. From there, we implement the strategy and technology to pave the way to a thriving planet.



# Fast-track your sustainability journey with Rockwell Automation today

Every day, we help tens of thousands of global customers achieve sustainability and productivity goals. Together we're expanding our ability to make a positive impact on the world by translating insights into impacts across energy, water and waste.

We are here to support you wherever you are on your sustainability journey, from getting the most out of your existing investments, to using these data and insights to automate intelligent actions and build for the future.

**Learn more about how Rockwell Automation can help you build a data-driven sustainability strategy today, with tomorrow in mind.**



Learn about how Rockwell Automation is working towards Net-Zero: [2022 Rockwell Automation Sustainability Report](#)



Connect with an expert and learn more about our sustainability solutions: [Rockwell Automation Sustainable Solutions website](#)



Browse our sustainability consulting services: [Kalypso Sustainability website](#)



Discover best practices for harnessing value from smart manufacturing: [2022 Rockwell Automation State of Smart Manufacturing Report](#)





**Optimize  
Production**



**Empower  
Workforce**



**Manage  
Risk**



**Drive  
Sustainability**



**Accelerate  
Transformation**

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[rockwellautomation.com](https://rockwellautomation.com)

expanding **human possibility**®

AMERICAS: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444

EUROPE/MIDDLE EAST/AFRICA: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2663 0600, Fax: (32) 2 663 0640

ASIA PACIFIC: Rockwell Automation, No. 2 Corporation Road, Singapore, 618494, Singapore, Tel: (65) 6302 8686, Fax: (65) 6302 8787

UNITED KINGDOM: Rockwell Automation Ltd., Pitfield, Kiln Farm, Milton Keynes, MK11 3DR, United Kingdom, Tel: (44)(1908) 838-800, Fax: (44)(1908) 261-917

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