:sas

Reduce carbon footprint and energy costs for more sustainable manufacturing

Lower energy usage and spend in heavy industries by optimizing energy costs

Save an avg.10% on energy costs, as high as 25%.

Reduce energy usage while maintaining quality and yield.

Create a more stable process by reducing variance.

Increase overall process understanding.

The Issue

The need to use less energy is becoming critical to manufacturers, especially those in heavy industries, because of their energy-intense processes. The cost of energy has been rising globally – surging 60% in 2022 to record highs* – and affecting production costs. The World Bank predicts energy prices will decline by 11% in 2023 (still leaving prices much higher than in 2021). However, it also acknowledges that Australian coal and US natural gas prices are still expected to be double their average over the last five years by 2024; European natural gas prices could be nearly four times higher*. To make matters worse, the International Energy Agency says, "the world is in the middle of a global energy crisis of unprecedented depth and complexity." Energy shortages around the world are leading to supply constraints and rationing.

Manufacturers must also meet the carbon reduction demands of external stakeholders, including investors, customers and governments. Investors are backing companies focused on environmental, social and governance (ESG) and divesting those with poor ESG ratings. Customers prefer to purchase sustainable products. Global governments continue to rapidly develop policies and regulations supporting sustainability. Therefore, manufacturers need to find a way to use less energy to successfully navigate these challenges.

*World Bank projects 11% energy price decline in 2023. Reuters.com.

The Challenge

- **High energy costs.** These can be a burden for heavy industries. With SAS® advanced analytics, manufacturers quickly realize significant energy cost savings.

- **Energy security and limited renewable energy.** Heavy industries often require a steady, consistent supply of nonrenewable energy sources that make energy security and access to renewable energy a challenge. SAS reduces the consumption of traditional energy sources to support the transition to 100% renewable energy.

- **Regulations and downtime.** Manufacturers must comply with changing emissions regulations without affecting operations or causing plant shutdowns. SAS helps lower energy use and carbon footprint without affecting operations or downtime.

- **Complexity.** Reducing variability in combustion processes can be complex. SAS advanced analytics simplifies the process by identifying areas where to tweak processes for greater stability.

- **Reporting.** Manufacturers need trustworthy reporting to measure and track progress effectively and avoid being accused of greenwashing. SAS delivers trustworthy AI that makes it easy to accurately measure and track improvement.

Our Approach

Manufacturers that reduce energy use will realize positive effects on their revenue and competitiveness. They must find a way to use less without disrupting production while transitioning to 100% renewable sources. Forrester forecasts that 30% of manufacturers will pivot IoT investments to reduce energy bills in its *Predictions 2023: Smart Manufacturing* report.

We approach the problem with our SAS Energy Cost Optimization accelerator, which uses SAS Analytics for IoT to help you:

- **Reduce energy costs and usage.** Provide engineers with the missing insights needed to improve key process parameters by analyzing the relationship between them and energy consumed.
- **Identify optimum shift parameters.** Use advanced analytics models for production runs to dynamically compare current and historical runs, and show the drivers of energy consumption.
- **Minimize energy consumption while maintaining quality.** Determine the exact setpoints that should be applied to the process using a set of mathematical optimization solvers.
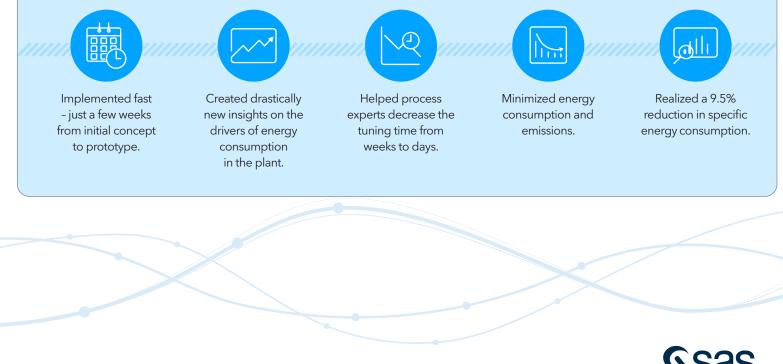- **Improve sustainability efforts.** Reduce carbon footprint and help meet ESG requirements.

The SAS® Difference

SAS Energy Cost Optimization accelerates time to value, lowers energy usage, manages rising costs and reduces CO_2 certificate spending – improving ESG ratings. It combines and analyzes IoT and process data from across the production process. Its analytical models predict specific energy consumption, make sense of variable impacts and provide mathematical optimization that takes the guesswork out of making improvements. Business value is achieved by empowering production operators to tune the process recipe setpoints.

- **Access, integrate and enrich data from varying sources.** Includes a data model that combines environmental, MES, PLC, SCADA and LIMS data, offering automated explainers of the process parameters most affecting energy consumption.
- **Easily deploy prebuilt machine-learning models.** Best-in-class analytics with easy-to-deploy models help users quickly learn what changes must be made across the plant to save energy.
- **View data analyses across the organization with prebuilt visualizations and dashboards.** Enable engineers to take quick, insight-backed actions that result in massive energy savings.

REDUCED VARIATIONS AND ENERGY CONSUMPTION

A global building materials manufacturer noticed high fluctuations in its production process that led to higher costs and energy usage, so it turned to SAS for help. Using SAS® Viya® on Microsoft Azure, SAS developed SAS Energy Cost Optimization. The solution quickly gave the manufacturer insights into root causes and how to tune processes to lower variations and overall energy consumption.

Implemented fast – just a few weeks from initial concept to prototype.	Created drastically new insights on the drivers of energy consumption in the plant.	Helped process experts decrease the tuning time from weeks to days.	Minimized energy consumption and emissions.	Realized a 9.5% reduction in specific energy consumption.

To learn more, please visit sas.com/energy-cost-optimization.