

Energy insights: the secret sauce for the food and beverage industry

Use actionable energy intelligence to improve energy costs and balance profitability with sustainability.

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#this is
positive
energy

Executive summary

Food and beverage companies work in an industry with tight margins, where customer experience is crucial and agility essential. Intense competition and rising input costs squeeze margins right across the sector. How can the industry meet these challenges?

The food and beverage industry is experiencing an era of unprecedented change, driven by technological advances, new global frameworks and a transformation of the supply chain to build resilience and efficiencies across the global food system. Rising raw material, energy and labor costs, stagnating consumer incomes, intense competition, and pricing pressures from retailers all mean that decent margins in the food and beverage industry are increasingly elusive.

With this in mind, the pressure on food and beverage companies to minimise waste and maximize resources has never been greater. They are under intense pressure to meet ever-growing demand from regulators and consumers – and will need to nourish a global population that is projected to rise from 7.8 billion in 2020 to 9.7 billion in 2050.¹

In addition, consumers are increasingly expecting that companies demonstrate a genuine commitment to sustainability and are choosing brands and products based on their environmental credentials. They are also demanding healthier, free-from

and plant-based options, putting increased demand on the cold chain to ensure the safety of perishable foods.

Across the entire supply chain, companies in the food and beverage industry rely on critical, energy-intensive assets that are notoriously fickle when it comes to performance. Increasingly, these companies are turning to next-generation Energy Management Systems (EMS) to monitor critical assets and ensure operational efficiency and performance – and prevent risk of costly downtime.

In this paper, we explore the challenges facing the food and beverage industry today and outline how companies can ensure performance, safeguard quality and strengthen their brand with smarter use of energy. We demonstrate how energy management can be the key to balancing profitability and sustainability through the implementation of non-invasive, wireless sensor technology that delivers actionable energy insights – the secret sauce that companies need to boost operational efficiency, reduce costs, and ensure the performance of their assets.

By gaining visibility into the performance and health of critical systems, food and beverage companies can reduce energy waste, maximize operational performance and ensure equipment reliability on the path to wider profit margins.

Energy challenges for the industry

Throughout every segment of the food and beverage industry – from growers to manufacturing to storage and cold chain to distribution and retail – narrow profit margins are often accepted as an inevitable part of the business. But with this acceptance, the industry must address the following energy challenges in order to improve and maximize their margins.

The high costs of energy-intensive processes

Energy costs in the food and beverage industry can be high, particularly when consistent refrigeration and heat-intensive processes are involved. The industry relies on the extensive use of refrigeration, heating, air compressors and other energy-intensive equipment across production processes.

Maximize efficiency and minimize waste

With energy prices unpredictable and likely to rise, improving efficiency and minimizing waste in the industry has become imperative to cutting energy costs. Reliance on aging assets results in costly inefficiencies – and building management system overrides, off-hours consumption, or equipment that is run inefficiently can also result in costly energy waste.

Perishable products make failures expensive

Given the perishable nature of raw ingredients and their outputs, many food and beverage manufacturers are very vulnerable to production downtime. Problems with heating processes, or refrigeration equipment in the cold chain or at supermarkets, can easily lead to a failure in meeting safety or quality standards. Equipment failures can be expensive and are not limited to maintenance and repair costs – damage also includes food waste, lost sales and a tarnished reputation.

More automation increases reliance on equipment

Continuing growth in the automation of food and beverage manufacturing processes – which improve operational efficiency and address staff shortages – increases the importance of proactively maintaining critical equipment to ensure uptime of production processes. The greater the reliance on technology, the greater the vulnerability to equipment failures. Resilient operations are critical to ensure products meet regulatory standards and reduce downtime.

The increased focus on energy sustainability

As environmental awareness continues to spread and deepen, food and beverage companies are under increasing pressure from consumers and regulators to focus on energy sustainability and reduce their carbon footprint. Many are now making a clear commitment to improving their environmental performance – according to our research², ‘being socially and environmentally responsible’ is a top 3 priority for businesses, and 89% agree that demonstrating a low carbon footprint will be essential for their brand by 2025.

56%

of manufacturers said investing in energy efficiency technologies was very important for their business³

52%

of food and beverage manufacturers said that the link between their sustainable energy usage and their brand image was very important³

Energy management has a vital role

The most accessible path to greater profit for companies in the food and beverage industry is a reduction in business-as-usual operating costs – including energy. Obtaining visibility into energy usage can be the key to balancing profitability and sustainability, and energy management can yield actionable and accountable energy insights to help companies address 3 key areas.

1. Increasing production efficiency to improve narrow margins

Accounting for a significant proportion of overheads, particularly in businesses with refrigeration needs and/or heat-intensive processes, energy constitutes a growing proportion of operational expenditure. With energy prices unpredictable and likely to rise, improving energy efficiency has become an imperative. But many food and beverage companies are currently running an aging and inefficient energy infrastructure, leading to unnecessary waste and costs that can be a significant burden to business success.

Lack of energy usage visibility can be overcome with energy insights technology that can unlock significant cost and consumption savings.

2. Improving resilience to reduce downtime and protect food quality

Even though unreliable equipment can lead to the risk of compliance breaches and production issues – as well as costly downtime, wasted resources and even compromised product quality – many food and beverage companies remain dependent on outdated energy systems. Implementing a data-led predictive maintenance program to keep critical assets running smoothly will be essential to ensuring the health of these systems, maintaining optimal levels of performance and building resilience.

Energy insights solutions enable effective predictive maintenance, ensure productivity and reduce risk of equipment failure and downtime.

3. Enhancing environmental performance and business agility for a sustainable future

The sector's carbon footprint is significant and consumers' increasing environmental concerns make it vital to demonstrate a commitment to energy sustainability. Food and beverage companies can enhance competitiveness and brand reputation with a sustainable, agile energy strategy. To build brand loyalty, attract environmentally-conscious consumers and meet the demands of regulators, the sector must improve its energy and carbon footprint. An effective energy management strategy can deliver savings and meet these objectives.

By analyzing actionable energy data from their infrastructure, companies can reduce energy waste for more efficient energy usage, reducing their carbon footprint.

Leading businesses are increasingly leveraging energy data to transform their business and accelerate their journey to energy efficiency, resilience and sustainability.

1/3

businesses are exploring how energy can lead to higher growth, greater efficiencies and reduced business risk⁴

76%

of sustainable businesses are utilizing data collected from sensors and smart devices to improve decision making, compared with 56% of other businesses⁴

45%

of sustainable businesses are transforming energy data into specific, actionable improvements⁴

Financial incentive to rethink energy management

Energy management can make a huge difference to a company's bottom line. But in the food and beverage industry, reducing both energy costs and downtime costs is more than just turning off the lights or scheduling maintenance. Inefficiencies must be identified and asset health must be monitored to minimize costly energy and product waste.

World energy consumption has more than doubled in the last 40 years and is projected to increase a further 30% by 2040⁵ – and the food and beverage industry is one that relies on energy-intensive processes as part of its infrastructure, accounting for a significant proportion of operating costs. Take conventional cold chains, for example. Refrigeration is an energy-intensive process that accounts for 15% of worldwide electricity production⁶, and demand will only increase as the population grows.

As such, driving greater efficiency and operational performance is an obvious area of focus to improve profitability – energy is not a static overhead, unable to be controlled. It can be an asset.

With an energy management strategy that utilizes real-time energy data to identify energy inefficiencies and waste, energy consumption can be significantly reduced – yielding substantial cost reductions.

However, a major problem for many food and beverage companies is a lack of visibility into how energy is actually being used throughout their infrastructure, preventing them from identifying current inefficiencies. This is where energy insights tools can be invaluable. Advanced sensor and analytics solutions pinpoint exactly how energy is being used, right down to the device level – identifying key areas to address to improve operational efficiency. One UK food and beverage manufacturer used this technology

to spot a sequence of operations errors within its cooling compressors. Data from sensors – tracking energy consumption correlated to ambient temperature – revealed sudden bursts that pointed to a particular mechanical miscalibration. By recalibrating the compressor, this manufacturer saved £115,000 (about \$157,000) per year.⁷

Aside from eliminating the costs of excessive energy consumption, an operation that pays close attention to its energy signature is in a better position to optimize equipment performance and diminish failure rates.

System failures carry costs that extend beyond those of simple repair. When refrigeration units fail, the result is costly product waste – or if an asset fails on the production line, it could impact production levels. Companies need critical assets like manufacturing equipment, refrigeration units, compressors, condensers and lighting to be working efficiently 24/7 – and with such thin margins, expensive and avoidable malfunctions are unacceptable.

In addition, proactively identifying equipment that isn't performing properly enables companies to make more informed procurement decisions – and they can measure the ROI of asset purchases by measuring energy input after installation.

Hundreds of thousands of dollars in energy cost savings can make a huge difference to a company's bottom line. For example, if food and beverage manufacturers can reduce the costs associated with production, then they can lower the price of their goods, giving them a competitive advantage.

Social incentive to rethink energy management

The energy intensity linked to the food and beverage industry also results in large levels of greenhouse gas emissions. The environmental impact of the industry needs to be considered – taking action to better manage energy consumption not only helps the planet, it saves money for companies and society as a whole.

Tighter regulations, increased awareness among employees, shareholders and investors, and above all increasingly uncompromising consumer attitudes have all helped shift environmental and sustainability performance from marginal concerns to core issues in today's commercial landscape. Environmental and sustainability credibility, in short, is no longer a nice-to-have – it's a must.

As our society, and in turn our governments, have become more aware of the impact of industries on the environment, companies have been made subject to sustainability and energy efficiency initiatives. Whether trying to meet a credential or a regulation, it is in a food and beverage company's own best interest to analyze real-time energy insights to reduce consumption throughout their energy infrastructure as part of a proactive energy management strategy.

It's not, however, just a matter of meeting statutory regulations. Companies are increasingly expected to demonstrate their social consciousness and environmental responsibility.

Far from trivial, with the rise of voluntary certification programs across the world (ENERGY STAR®, B Corp Certification, Carbon Trust Standard, EU Eco-Management and Audit Scheme (EMAS), Forest Stewardship Council® (FSC), the ISO 14000 family, Monitoring Certification Scheme (MCERTS), etc) and the subsequent command of public interest, the pressure for companies to place positively within those programs is intense.

Some best-in-class companies in the industry have embraced this business forward mentality in their Corporate Social Responsibility commitments.

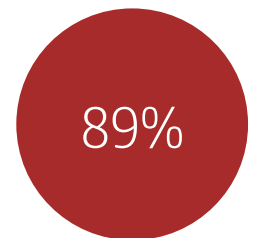
One example is Kroger. This food retail brand achieved its goal of 40% electricity savings in its supermarkets by 2020⁸ and has established various other goals through the decade to demonstrate sustainability leadership. By eliminating waste, increasing efficiency, and sourcing responsibly in their supply chain, Kroger has received tremendous positive press and bolstered customer loyalty while simultaneously managing to save money and protect the environment with its pledge to reduce its carbon footprint.

Food manufacturer Kellogg Company is also addressing climate change by reducing greenhouse gas emissions and energy usage throughout their operations and along their supply chain – they published a long-term target of a 65% reduction in Scope 1 and 2 emissions in their operations (manufacturing, offices, warehouses and fleet) by 2050.⁹

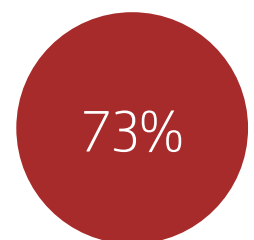
No longer is corporate environmental responsibility a matter of positive press, but it's a must – and greater insight into operations to yield more efficient energy usage that reduces CO₂ emissions and minimizes energy waste will be critical.



'Being socially and environmentally responsible' is a top 3 priority for businesses we surveyed.¹⁰



89% of businesses agree that demonstrating a low carbon footprint will be essential for their brand by 2025.¹⁰



73% of businesses are accelerating plans to develop more demonstrably sustainable products and services.¹⁰

8. <http://sustainability.kroger.com/2020-goals.html>

9. <http://crrreport.kelloggcompany.com/energy-conservation>

10. <https://www.centricabusinesssolutions.com/us/distributed-energy-future-trends>

Putting together a recipe for success

This is where a device-level energy management system (EMS) comes in. Through smart sensors, an advanced EMS affords managers a much more granular view into the inefficiencies stemming from each device in their operation.

No longer needing to wait until month's end to gain limited, broad-stroke insight into energy consumption via an electric bill, food and beverage companies leveraging device-level EMS technology have on-demand access to equipment performance information – shining a bright light on operational improvement opportunities.

In practice, smart sensors assess performance and provide real-time analytics to stakeholders. When monitoring energy consumption, this data feedback enables improved operational efficiency and allows users to pre-empt failures, first at the device level and then at the system level.

In the past, companies solved problems as they arose. A refrigerator fails, so the contents go to waste and someone is called in for repairs. This approach eventually gave way to a more proactive model wherein companies would schedule routine maintenance. The downside to a preventative regimen, of

course, is that it involves some degree of totally unnecessary downtime and maintenance – and both are expensive. Now, with the ability to easily deploy smart sensors, there's a better, prescriptive way.

With smart sensors in place that enable early stage malfunction and waste detection, equipment can be maintained only when the need arises and still before material degradation, system hindrance, or operational failure occurs.

With a simultaneously comprehensive and granular degree of oversight, companies can look beyond simple malfunction and repair. By benchmarking the incoming data stream for each machine against industry standards, similar equipment, and its own operational records, the system can – for example – recognize cooling cycles that are more frequent than necessary. Addressing that kind of issue is great for the environment and great for profit margins.

In practice, smart sensors assess the performance of assets and processes and provide real-time, actionable energy data to stakeholders.



Why Panoramic Power™?

There are plenty of EMS platforms, but our energy insights solution – which consists of our portfolio of Panoramic Power wireless sensors – is unique in its simple installation, self-powered ease of use and next-gen data processing.

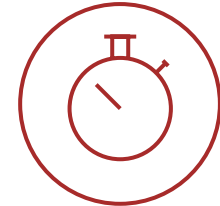
With our Panoramic Power unobtrusive, wireless, self-powered sensors, food and beverage companies don't need to disrupt operations in order to deploy the sensors. Being able to monitor power-consuming, critical assets throughout an energy infrastructure entails a simple installation process – at the circuit breaker, the sensors easily snap onto the outgoing electrical wire that powers each device.

There are many different types of EMS platforms available today. Some monitor on the building level, on the floor, panel level or system level. However, monitoring on the device level provides the most granular visibility possible. While other EMS or BMS (Building Management Systems) send data every thirty seconds or every couple of minutes, our Panoramic Power technology aggregates data every ten seconds before sending it to a communications bridge, which uploads the data to our cloud-based energy management platform, PowerRadar™, for machine-learning enabled data processing.

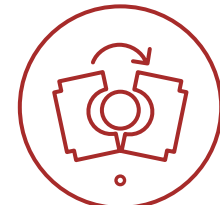
The difference between ten seconds and thirty seconds may seem small – but in the world of electricity, it's an eternity.

A surge strong enough to overwhelm a company's equipment and cause a total system shutdown can easily occur and recede within a span of seconds. A one thirtieth view into the energy draw includes enormous gaps in visibility. The larger the gaps, the longer it will take to detect consumption patterns that deviate from the acceptable range.

Drawing on deep learning data insights, PowerRadar sends real-time alerts to site managers and generates automated, detailed and actionable reports. Benchmarking among devices, sites and regions helps detect suboptimal operations. When appropriately leveraged, return on investment for the Panoramic Power technology is often achieved within six months – but the energy insights achieved can be invaluable to improving a company's bottom line.



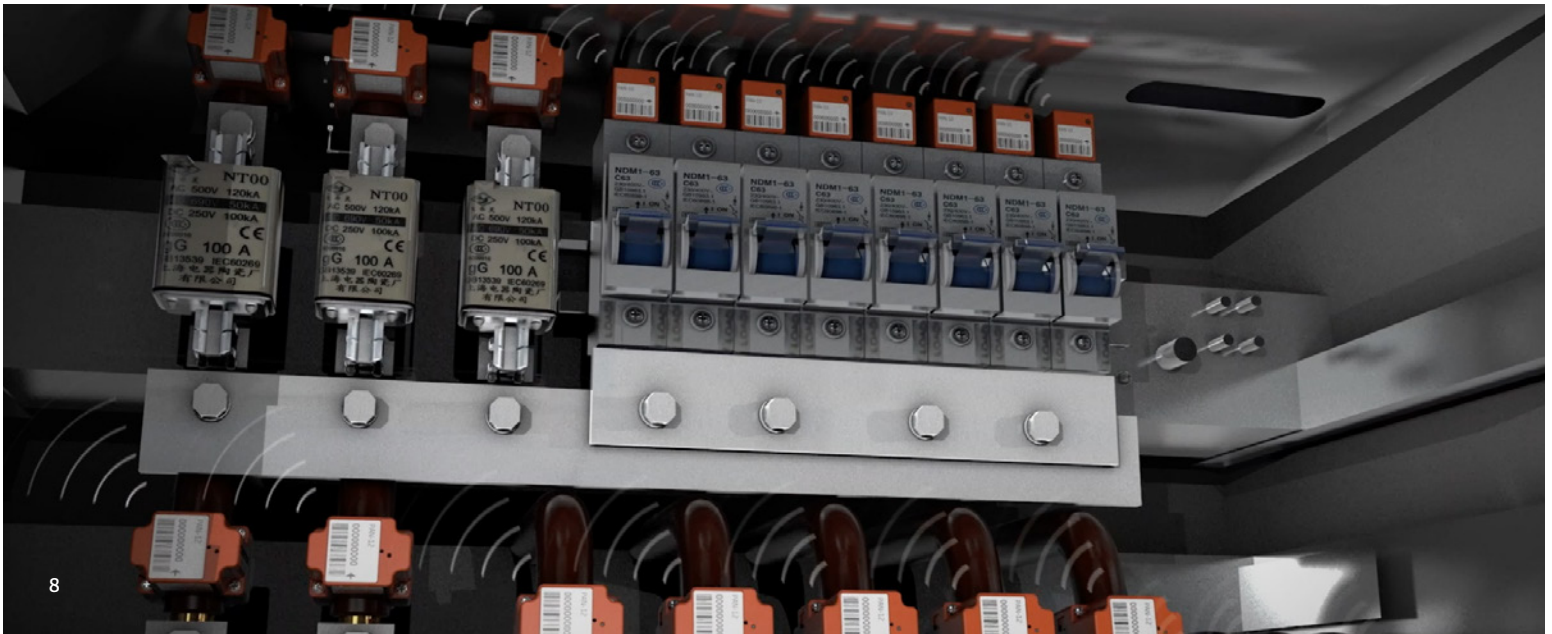
Real-time energy intelligence



Snap-and-fit implementation



Wireless and self-powered



Transform challenges into opportunities

The Internet of Things (IoT) is a phrase used to describe how physical “things” can be made intelligent, connected and able to collect and share data with the use of sensors – and it can be a strategic asset for the food and beverage industry.

The IoT is making our world smarter by connecting people, processes, data and devices – and as a result is driving a new era of operational awareness and performance. The number of IoT-enabled devices continues to grow – there are already more connected “things” than people in the world. Tech analyst firm International Data Corporation (IDC) predicts that by 2025, there will be 55.7 billion connected IoT devices – or “things”.¹¹

The IoT is revolutionizing operational performance and efficiency by delivering real-time, actionable intelligence, and the food and beverage industry epitomizes the value add potential of the IoT. As an industry that relies on energy-intensive equipment and processes, connecting these assets to the IoT – via the deployment of Panoramic Power wireless sensors – enables food and beverage companies to harness real-time energy intelligence from their systems and processes to drive their energy strategy

forward. Innovative energy solutions like our Panoramic Power technology can help the industry leverage the power of smart, connected infrastructure to cut costs, identify energy waste and performance issues, ensure operational resilience and product quality and support ever-greater process automation.

The constant quest to decrease costs and increase tight margins – while serving a growing population and meeting increasing demands from consumers and regulators – is weighing on the food and beverage industry, and never before has there been such a large piece of the puzzle so readily available to help companies meet these challenges. The technology to cut energy costs, reduce energy consumption, boost operational performance, and extend equipment longevity exists. It’s just a question of whether or not you choose to leverage it – and transform your challenges into opportunities.

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About Centrica Business Solutions

Partner with us and build your energy pathway to becoming a more sustainable business.

Our role is to understand your business and identify how our solutions can help you achieve your objectives.

Our unique approach brings together the expertise of our people and the power of distributed energy, helping organizations across the globe to balance economic success with environmental responsibility.

Our energy experts work with you to identify opportunities, develop plans to realize them, and provide full service support.

Building your Energy Pathway to the future.

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