CUSTOMER CASE STUDY

Henkel harnesses its big data to drive sustainability and boost energy efficiency

Henkel AG & Co. KGaA - www.henkel.in
Industry - Consumer Packaged Goods (CPG)

Goals

- Reduce specific energy consumption and confirm ISO 50001 certification for all Laundry & Home Care production sites
- Improve supply-chain resource efficiency on the production side by 5-6% annually
- Become three times more efficient by 2030

Challenges

- Improvements were needed in the collection, use and communication of consumption and emissions data across the length of Henkel's global supply chain

Solution

- AVEVA™ System Platform
- AVEVA™ Historian
- AVEVA™ Manufacturing Execution System - Performance

Results

- Solution support for growth and sustainability strategies has resulted in incremental reduced year-on-year energy consumption, by up to 16% in 2020, on top of other on-going reduction measures, such as investing in more sustainable process and automation equipment
- Annual energy cost savings are growing, reaching an incremental €8 million, driven by digital analytics in 2020
- Energy cost savings to date have topped €37 million
- Exponential ROI delivered: full payback delivered within four years; quadrupled ROI after eight years
- Reduction in filling line waste and elimination of all incorrect labelling resulting in 100% label quality
- Improvements of 15% in overall equipment effectiveness (OEE) after just two years

The German fast-moving consumer goods (FMCG) manufacturer Henkel operates globally with more than 52,000 employees. Its brands span three business units: Adhesive Technologies, Beauty Care and Laundry & Home Care. Henkel aims to promote sustainability in all its business activities, reinforcing its leadership position and optimizing its energy consumption.

Henkel 2020+

Through a series of initiatives called Henkel 2020+, the manufacturer aimed to generate sustainable profitable growth in the lead up to 2020 and beyond. By implementing digital transformation across the entire company to increase agility, Henkel intended to achieve growth, reinforce relationships with its customers, and optimize processes. In March 2020, Henkel introduced the new Purposeful Growth strategic framework, creating superior customer and consumer value to outgrow Henkel's markets, reinforcing the leadership in sustainability and enabling employees to grow, professionally and personally, through their work at Henkel.

Sustainability goals

With a focus on implementing sustainable innovations while improving resource efficiency and adding value, Henkel's target is to become three times more efficient by 2030 in relation to the environmental footprint. Henkel aims to create more value in the areas of social progress, health and safety, as well as performance. In energy and climate, materials and waste, and water and wastewater, it aims to reduce its consumption of resources to limit the corporate footprint.

Henkel's oldest business unit is Laundry & Home Care with well-known products like Persil, Somat, Pril and Purex. Improvements within this business area were needed in the collection, use and communication of consumption and emissions data across the length of the global supply chain.

Henkel also wanted to cut specific energy consumption and meet ISO 50001 certification for all Laundry and Home Care production sites in 2011, and accelerate supply-chain resource efficiency improvements on the production side from 3% to 5-6% annually.

New energy monitoring system kicks off the sustainability journey

To achieve these goals, Henkel decided in 2013 to implement a new environmental management system (EMS). The first phase of the EMS was the implementation of an energy monitoring system that would:

- Be the global solution for all sites, being installed and maintained centrally
- Be based on a unified database for structured retrieval and aggregation of usage data
- Be flexible and agnostic in data acquisition – able to integrate any previously available software into the system
- Report all KPIs and benchmarking centrally across all production sites (with the aim of sharing best practices)
- Work online and in real time – information should be accessible at any time and from anywhere on the Henkel network
- Buffer efficiently in case of network problems

The solution

Henkel chose to implement a digital backbone and further develop the pre-existing information system in a flexible and demand-oriented way. For its sustainability goals to be achieved, it was critical that the new solution possess the capability for the new measures to be implemented continuously and immediately.

"We adopted a digital backbone as this facilitates a vertical approach, meaning we can implement any add-on application in a 'plug-and-play manner' across the entire global value chain within months. In our experience, this is not only faster (than creating then duplicating a state-of-the art site), but also ensures each application roll-out quickly generates tangible business benefits."

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Dr. Dirk Holbach, Corporate Senior Vice President,
Global Supply Chain Laundry & Home Care, Henkel

Implementation with the support of local technical expertise

Henkel worked with an experienced system integrator in Germany, EMP Etteplan GmbH, to implement the energy monitoring system, with software provided by AVEVA. The project team was ably supported by the Henkel supply-chain production experts.

Etteplan provides solutions for industrial equipment and plant engineering, software and embedded solutions, and technical documentation solutions to the world's leading companies in the manufacturing industry.

The services are geared to improve the competitiveness of customers' products, services and engineering processes throughout the product life cycle. The results of Etteplan's innovative engineering can be seen in numerous industrial solutions and everyday products.

The AVEVA solutions offered Henkel's Laundry & Home Care business unit an attractive and sustainable concept that met all the information system architecture requirements. The project took less than 18 months to complete, and included a preconfigured energy monitoring solution using AVEVA System Platform and AVEVA Historian. Over the course of the implementation, extra modules were added to the standard energy monitoring application.

Software that integrates with existing and future hardware

Henkel created an elegant device-agnostic solution with AVEVA as the main software platform. The domain, database, application programs and device integration can be configured independently, without affecting the architecture. The AVEVA solution also enabled Henkel to integrate legacy hardware seamlessly and easily. Existing and future hardware communication standards across various global plants, such as Siemens S7 PLC, Modbus, Ethernet, OPC Servers, and CSV files were assimilated efficiently into the solution.

Energy use is monitored efficiently

By the end of 2020, more than 4,000 physical and virtual sensors had been integrated into the system, measuring electricity, fossil fuels, compressed air, steam, water and sewage. More than one million data points are captured per day. These measurements highlight energy use on a factory-wide level, and also drill down into individual production areas and technologies. Consumption is now measured more accurately, and the results can be analyzed and evaluated within meaningful parameters. This enables Henkel to implement corrective action, resulting in an energy consumption reduction.

Collecting the right data and making specific process improvements

The AVEVA solution is used by more than 2000 users. On the shop floor, relevant information is viewed on touch-screen devices, allowing working teams to regularly discuss performance. The solution makes it possible to efficiently access data from across the entire company. It enables instant analysis of data to immediately add value to operations. The solution helps consolidate and contextualize data in a meaningful format, making it possible to review and massage this data so problematic areas become easier to identify.

Labelling, key metrics and SAP integration

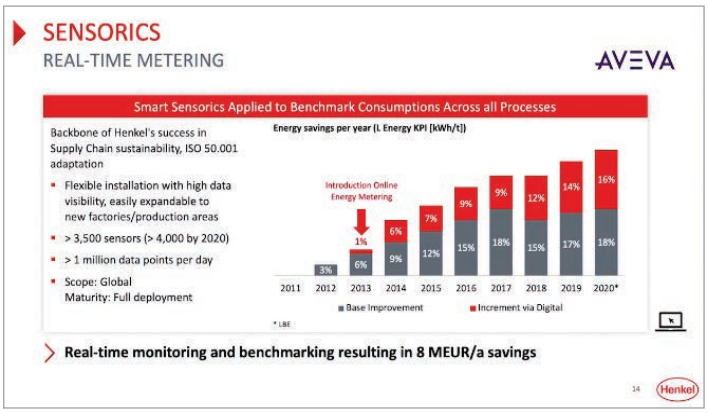
In 2014, the digital backbone was integrated with the labelling quality control system. Labels from every bottle are photographed and the subsequent evaluation helps improve quality and reduce waste. Statistical data is also collected and sent to the central reporting system.

In 2015, Henkel, AVEVA and EMP Etteplan expanded the digital backbone and implemented a manufacturing execution system (MES), in order to obtain key metrics. AVEVA Manufacturing Execution System - Performance delivers overall equipment efficiency (OEE) data that further increases the efficiency of filling lines to improve throughput, allowing Henkel to increase capacities across its markets. AVEVA Manufacturing Execution System also provides Henkel with downtime information for all its machines, enabling the manufacturer to better understand what is happening on each manufacturing line, so that targeted improvements can be implemented. Information on rejections from the MES drives efficient raw material usage, improved packaging operations, and waste reductions.

In addition, an SAP interface was created so that data associated with line and machine status can be combined with job data. This capability enables Henkel to obtain additional analyses at the job level. Sensors were also installed for recording weather data at the Laundry & Home Care production facilities. By using the MES to correlate energy consumption data with weather conditions, Henkel can determine how outdoor temperature and humidity affect energy consumption. This allows for further refining of production, energy usage, and logistics planning.

Benefits and results

The Laundry & Home Care business unit has seen significant improvements to its sustainability efforts as a result of its AVEVA-based solution. Energy consumption has fallen and resource efficiency has increased. The following graphic illustrates how the energy savings have grown year-on-year. The grey bars represent Henkel's baseline energy improvements whilst the red bars show how the AVEVA-based solution has driven additional improvements.



"When we introduced our AVEVA solution in 2013 we were already achieving a 3% year-on-year energy saving on every ton of product produced. Once we'd implemented the solution, we saw a clear increase in energy efficiency. The AVEVA-based EMS solution has reduced Henkel's energy consumption (kWh/t) year-on-year, by up to 16% in 2020, on top of our regular activities. To put this into perspective, the energy saved is equivalent to the capacity needed to support the three million inhabitants of two European capital cities, Amsterdam and Vienna."

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Wolfgang Weber, Corporate Director,
Digital Transformation & Engineering Laundry & Home Care, Henkel

In terms of financial savings, each energy saving percentage point approximately equates to a saving of €0.5 million per year. As a result, the AVEVA-based solution has saved Henkel €37 million to date, with the latest annual saving having now reached €8 million per year, compared to the base year. Consolidating the financial gains delivered by the solution each year represents full payback four times over, with 100% ROI delivered after less than four years.

As a result of its successful implementation of AVEVA Manufacturing Execution System, Henkel has reduced filling line waste and eliminated virtually all incorrect labelling (100% label quality ex-line and more than 99.8% first time right for label application globally). This leads to the highest guaranteed product quality, and to significant savings in packaging. The solution also drove improvements in OEE of an average of 15% after just two years.

"In this project, we successfully made our worldwide energy consumption data available to supply chain managers in real time. This was an enormous step forward. Having implemented clear optimization measures in the last few years, we are now focusing increasingly on benchmarking and leveraging machine learning for more complex and energy-intensive processes, like spray-drying of laundry powder detergents. This will enable us to continue to significantly contribute towards achieving our sustainability goals."

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Dr. Dirk Holbach, Corporate Senior Vice President,
Global Supply Chain Laundry & Home Care, Henkel

Looking ahead

At Henkel, industry 4.0 is in full swing. The AVEVA digital backbone in the Laundry & Home Care business area has proved to be a flexible, expandable and scalable solution, one that is helping the company achieve its ambitious targets. The existing infrastructure and data pools have been integrated and homogenized to the greatest-possible extent, with no limits to the future automation and optimization of Henkel's value-creation processes.

"In term of our vision for the future, the AVEVA software solution will continue to be an efficient tool that Henkel uses to achieve its goals. We are now working with AVEVA in other business units to drive further sustainability success. Sustainability and efficient use of resources is firmly anchored in Henkel's corporate values – and this isn't something recent. We were one of the first companies to start publishing an annual sustainability report thirty years ago. We have our sights set firmly on our long-term sustainability goals, and are proud that our commitment is frequently recognized by external bodies, such as the World Economic Forum (WEF) and the Dow Jones Sustainability Index (DJSI)."

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Dr. Dirk Holbach, Corporate Senior Vice President,
Global Supply Chain Laundry & Home Care, Henkel

"Henkel has always had a flair for implementing creative ideas to save energy effectively. The real challenge here was to gain a good pool of data."

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Dr. Johannes Holtbrügge, Senior Manager,
Digital Transformation, Henkel