



## CUSTOMER CASE STUDY

# How Henkel Uses Big Data to Reduce its Environmental Footprint

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

## Goals

- To reduce specific energy consumption and support ISO 50001 certification for all production sites.
- To improve supply-chain resource efficiency on the production side by 5 to 6 percent annually, 75% increase of overall efficiency by 2020, and finally, to be 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 its global supply chain.

## Solution

- System Platform
- Process Historian
- Performance
- Intelligence

## Results

- Solution support for growth and sustainability strategies has resulted in 9% reduction in energy consumption, this translates to €15 million in energy costs saved
- Reduction in filling line waste and elimination of all incorrect labeling resulted in 100% label quality.
- Performance installation has demonstrated measurable improvements of 4.5% in OEE after just one year

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The consumer packaged goods manufacturer aims to promote sustainability in all its business activities, reinforcing its leadership position, and optimizing its energy consumption by 2020.

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“Henkel decided to create a Digital Backbone Infrastructure for its Laundry & Home Care Business Area and use it as a vehicle to implement and further develop a flexible and demand-oriented information system. To achieve its sustainability goals, it was critical that the new solution possess the capability for the new measures to be implemented continuously and immediately.”

## The Company

Henkel AG & Co. KGaA (Henkel), is a consumer-packaged goods (CPG) company based in Düsseldorf-Holthausen, Germany. It was founded in 1876 and employs more than 50,000 employees worldwide.

Henkel operates globally with leading innovations, brands and technologies in three business areas: Adhesive Technologies, Beauty Care, and Laundry & Home Care.

A lot has changed since the company was founded over 140 years ago. In 2016, Henkel achieved €18.7 billion in revenues and approximately €2.1 billion annual profits. The company's impressive success is the result of a clear, long-term strategy based on three pillars:

- Constant focus on customers' needs
- Sustainability
- Innovation

## Henkel 2020+

Henkel 2020+ is meant to generate sustainable profitable growth through to 2020 and beyond. To achieve this, the company goals are more customer-focused, more innovative, agile and digital. It aims to promote sustainability in all its business activities, reinforcing its leading position in the future.

By implementing digital transformation across the entire company, Henkel aims to achieve successful growth, reinforce relationships with its customers, and optimize processes. To do this, a series of initiatives, called Henkel 2020+, has been initiated to be completed by the year 2020.

## The Henkel 2020+ Focus is on Growth, Digitization and Agility Focused on These Strategic Priorities:

- Drive Growth
- Fund Growth
- Increase Agility
- Accelerate Digitization

Henkel's focus is on implementing sustainable innovations while improving resource efficiency when adding value.

## Goals

In the Laundry & Home Care business area, improvements were needed in the collection, use and communication of consumption and emissions data across the length of the global supply chain.

Henkel's oldest business area is Laundry & Home Care with well-known products like Persil, Somat, Pril and Purex. The company manufactures a wide range of products from 31 locations. These include detergents, dish-washing products, surface cleaners and toilet cleaners.



The company goal is to reduce specific energy consumption and support ISO 50001 certification for all production sites, as well as improve supply-chain resource efficiency on the production side by 5 to 6 percent annually.

**AVEVA is a technology partner for Henkel, providing expertise in sustainability management and digital transformation solutions.**

### Requirements

To achieve these goals, Henkel decided to implement a new Environmental Management System (EMS). The first phase was to develop the EMS step-by-step. It began with the implementation of an energy monitoring system. In the search for a suitable solution, the following specifications were required.

The system should...

- Be the global solution for all sites and, as such, be 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 decided to create a Digital Backbone Infrastructure for its Laundry & Home Care Business Area and use it as a vehicle to implement 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.

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Henkel's target is become three times more efficient by 2030. Henkel aims to create more value in the areas of social progress, health, safety, and performance. In energy and climate, materials and waste and water and sanitation, it aims to reduce its consumption of resources to limit their corporate footprint. Interim goal by 2020: Increase overall efficiency by 75 percent

## Implementation

To implement its EMS, Henkel selected software technology from AVEVA. Henkel entrusted an experienced system integrator, EMP GmbH (from Leverkusen, Germany), with implementing the Energy Monitoring System. This project was ably supported by the Henkel supply-chain production experts.

The project was launched in 2013 and completed by mid-2015. A preconfigured energy monitoring solution was created using System Platform and Process Historian. Over the course of the implementation, extra modules were added to the standard energy monitoring application.

The Wonderware Software Technology offers Henkel's Laundry & Home Care sector an attractive and sustainable concept that meets all the information system architecture requirements.

## Software that Integrates with Existing and Future Hardware

Henkel created an elegant device agnostic solution with Wonderware as the main software platform. It is now able to use whatever hardware, current or future, and configure its domain, database, application programs, and device integration independently without affecting the architecture. Best-In-Class hardware solutions can be installed, confident with the knowledge that it will communicate and integrate properly with the EMS. The Wonderware solution also enables Henkel to integrate legacy hardware seamlessly and easily even if they are already installed in existing locations. Current and future hardware communication standards at their various global plants, like Siemens S7 PLC, Modbus, Ethernet, OPC Servers, and CSV files, are assimilated efficiently in the solution.

## Local Technical Support

The EMP Planungsgesellschaft für Prozeßautomation mbH [EMP Planning Company for Process Automation] was founded in 1984 in Leverkusen, and currently employs around 140 (computer scientists, engineers and technicians) at its four locations in Berlin, Bottrop, Leverkusen and Frankfurt.

Divided into software and hardware planning sections, EMP offers a comprehensive range of services from analysis to concept development and implementation, right through to system support during operation.

EMP originated as a planning company for automation of industrial processes. Over the years, it has also become an expert for complex solutions in energy management, building management and operational management. Its experienced staff focus their efforts on creating future-proof and integrated solutions.

EMP became a Wonderware System Integrator partner in 1996. It has since gained extensive experience in project implementation with the Wonderware software suite of products.

## Energy use is monitored efficiently

By September of 2017, over 3,000 points have been integrated into the system, measuring electricity, fossil fuels, compressed air, steam, water, and sewage. These measurements capture not only energy use on a factory-wide level, but also drill down into individual production areas and technologies. Consumption is measured more accurately, and the results analyzed and evaluated within meaningful parameters. This enables Henkel to implement corrective action, resulting in a consumption reduction.

The solution is used by 600 users. On the shop floor, relevant information is viewed on touch-screen devices, allowing working teams to regularly discuss performance.

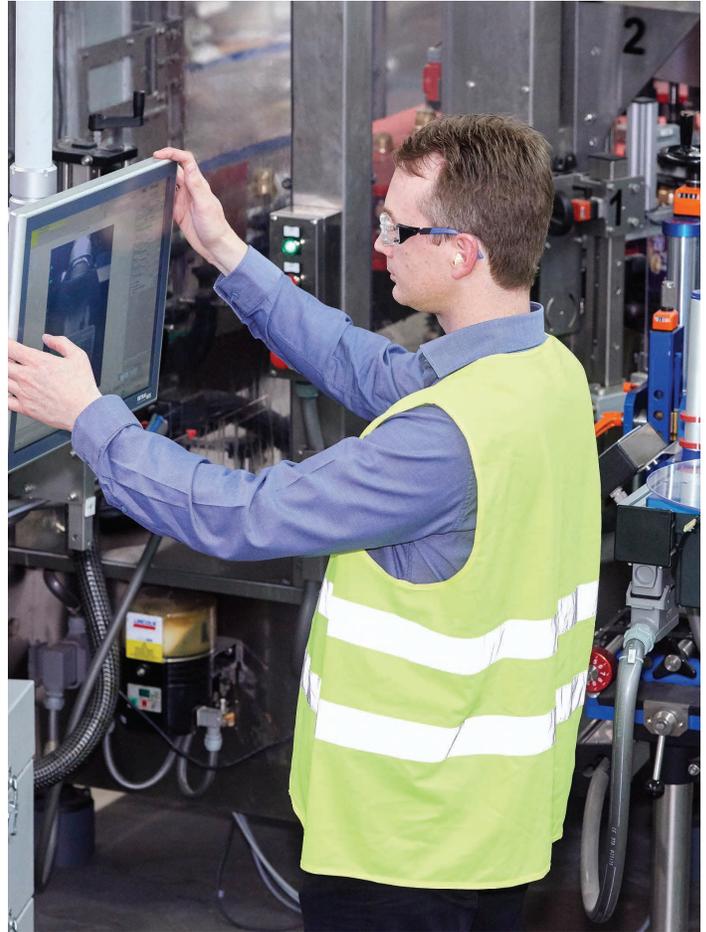
## The major challenges of implementing the Henkel energy monitoring system is two-fold:

- The global infrastructure is enabled for real-time data transmission
- The selection of assets is efficient, allowing for targeted measurement of usage

To achieve this, Henkel set a measurement standard. They defined the minimum technical requirements for interconnection with the EMS on a one-to-one basis for all devices. At the same time, they incorporated all factory-specific limit values and specific features.

## Best Practices and Standardization

Improvements made, via the sharing of best practices, can easily be replicated due to the uniform structures within the global system and the comparison capabilities between the properties and processes. Special user training sessions support the integration and use of the new online system.



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## Collecting the right data and making specific process improvements.

Wonderware software makes it possible to efficiently access data from across the entire company. It enables instant analysis of data where value is added to operations instantly.

AVEVA's Information Management software helps consolidate and contextualize data in a meaningful format. The software technology makes it possible to review and massage this data so problematic areas become easier to identify.

Production plants are traditionally made up of different functional areas. These are staffed by different people and are operated and are traditionally managed using different software systems. In each individual functional area, corresponding systems are in place at both the financial and production levels. To close these gaps, knowledge and experience are required.

Companies with geographically distributed production sites that have complex processes and systems are faced with the challenge of generating the necessary information that improves operational efficiency.

## The following System Platform features provide efficiency improvement:

- It is an open engineering and runtime platform that is suitable for industrial use that allows for integration across sectors, as well as management of business, manufacturing and production processes and data.
- It offers a wide range of industrial applications for rapid ROI-oriented performance optimization of systems, including the management of production processes.
- It provides an object-oriented approach, which allows for reusable modeling, hardware agnosticism, and integral standardization of operational processes.

## Labeling, OEE and SAP integration

In 2014, the Wonderware digital backbone was integrated with the Labeling quality control system. Labels from every bottle is photographed and the

resulting evaluation helps improve quality and reduce waste. Statistical data is also collected and sent to the central reporting system.

In 2015, Henkel and EMP started to implement an MES solution based on Performance. The existing digital backbone was expanded as Overall Equipment Efficiency (OEE) was added to the capabilities, further increasing the efficiency of filling lines.

Finally, thanks to the SAP interface, data associated with line and machine status can now be combined with job data. This capability enables Henkel to obtain additional analyses on the job level.

## Seamless Control Integration

A master PLC collects information from all the PLC's controlling the machines. The master PLC then transfers this data to the AVEVA software based solution (Performance) which then calculates OEE. By connecting Performance to the Programmable Logic Controllers (PLC), Henkel is able to collect downtime information. This allows them to better understand what is happening in all the manufacturing lines. It also enables them to implement targeted improvements in all their assets.

## OEE and Downtime Metrics

Information on reject enables targeted improvement. This results in savings in terms of efficient raw material usage, improved packaging operations, and waste reduction.

The increase in OEE value in the filling lines greatly improves throughput. This allows Henkel to increase capacity on all markets.

The requirement of Capital Expenditure (CAPEX) is also reduced to around three or four additional lines. In 2016, Henkel installed a tableau server for the visualization and analysis of data captured from all the connected systems.

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In 2017, sensors were installed for recording weather data at the Laundry & Home Care production facilities. By correlating energy consumption with weather conditions, Henkel determines how outdoor temperature and humidity affects energy consumption. This allows for further refining of production, energy usage, and logistics planning.

## Improving processes, analyzing data and reporting systems with no limits

The AVEVA Software's Manufacturing Operations Management Portfolio helps in the standardization of production processes and helps make operations more efficient.

To ensure standardization, a common control, monitoring and measurement system can be put in place regardless of hardware variety and degree of automation of the individual production sites.

Multiple data analysis tools from the AVEVA Information Management Portfolio can process industrial big data in a meaningful way. There is also a range of different solutions that can provide information on demand, in a meaningful format.

This type of information management for industry makes it possible to implement operational improvements, leading to optimized business operations. Furthermore, specific characteristics of the production sites in the digital plant information models are considered in real-time.

## Benefits and Results

The Laundry & Home Care business area has improved sustainability efforts through the AVEVA Software based solution - energy consumption has fallen and resource efficiency has increased.

The new system has reduced energy consumption by 9 percent since 2011 (kWh/t). As a result, the system contributed to an overall reduction in expenditure on energy in the Laundry & Home Care sector. Energy costs have decreased by €15 million.

Henkel is able to reduce filling line waste and eliminate virtually all incorrect labeling (100 percent label quality ex-line & > 99.8 percent first time right for label application globally). This leads not only to the highest guaranteed product quality, but also to significant savings in packaging.

The successful implementation of Performance has demonstrated measurable improvements in OEE of an average of 4.5% after just one year.

The Wonderware 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. There really are no limits to the future automation and optimization of Henkel's value-creation processes. Information Management Portfolio can process industrial big data in a meaningful way. There is also a range of different solutions that can provide information on demand, in a meaningful format.

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“Henkel has always had a flair for implementing creative ideas to save energy effectively. The real challenge here is having a good pool of data.”

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Dr. Johannes Holtbrügge Henkel,  
EMS project manager



## Forging Forward and Future Outlooks

In the future, Henkel will continue to work consistently toward achieving its ambitious sustainability goals. This future will be closely tied to digital transformation of its value creation processes. The focus is on the automation of (paperless) procedures and processes. It includes end-to-end data collection and integration of relevant real-time information across the entire supply chain.

**The AVEVA software solution will continue to be an efficient tool that Henkel uses to achieve all its goals.**

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At Henkel, industry 4.0 is already in full swing. And the company will leverage projects and activities in this area further going forward – from planning, sourcing and production to the delivery of its products and solutions.

## About Henkel's three globally operating business units

Laundry & Home Care business is 31 percent of total company sales, worth €5,795 millions. It includes heavy-duty and specialty detergents, fabric softeners, laundry-performance enhancers and other fabric-care products, hand and automatic-dishwashing products, and bathroom and household cleaners.

Products from the Beauty Care business unit is 20 percent of total company sales worth of €3,838 million. It includes hair colorants, styling and care, toiletries, skin care and oral hygiene.

The Adhesive Technologies business is 48 percent of total company sales worth €8,961 million. It manufactures adhesives, sealants and functional coatings for consumers, craftsmen and industrial applications.

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Three questions for Dr. Dirk Holbach,  
Corporate Senior Vice President Global  
Supply Chain Laundry & Home Care:

**1. What is your vision for sustainable supply-chain management at Henkel?**

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 a yearly sustainability report. We have our sights set firmly on our long-term sustainability goals, and are proud that our commitment is being recognized by external bodies. Henkel has already been included in the Dow Jones Sustainability Index (DJSI) at least 15 times, and this year, an industry group leader. The supply chain's contribution to sustainability is significant because, with our many plants and warehouses, we have great potential for improvements at our disposal.

**2. What are the benefits of the EMS project for Henkel?**

In this project, we successfully made data on our worldwide energy consumption available to supply chain managers in real time. This is an enormous step forward. Particularly after being able to implement clear optimization measures in the last few years, we are now focusing increasingly on benchmarking. By doing so, we can continue to contribute significantly towards achieving our sustainability goals.

**3. Why did you choose Wonderware software technology for the digital backbone?**

For us at Henkel, it is important to have a global partner by our side who supports us proactively in our business of fast-moving consumer goods (FMCGs). One major advantage was the modular structure of the Wonderware technology, as I can select these modules based on individual requirements and implement them quickly.

