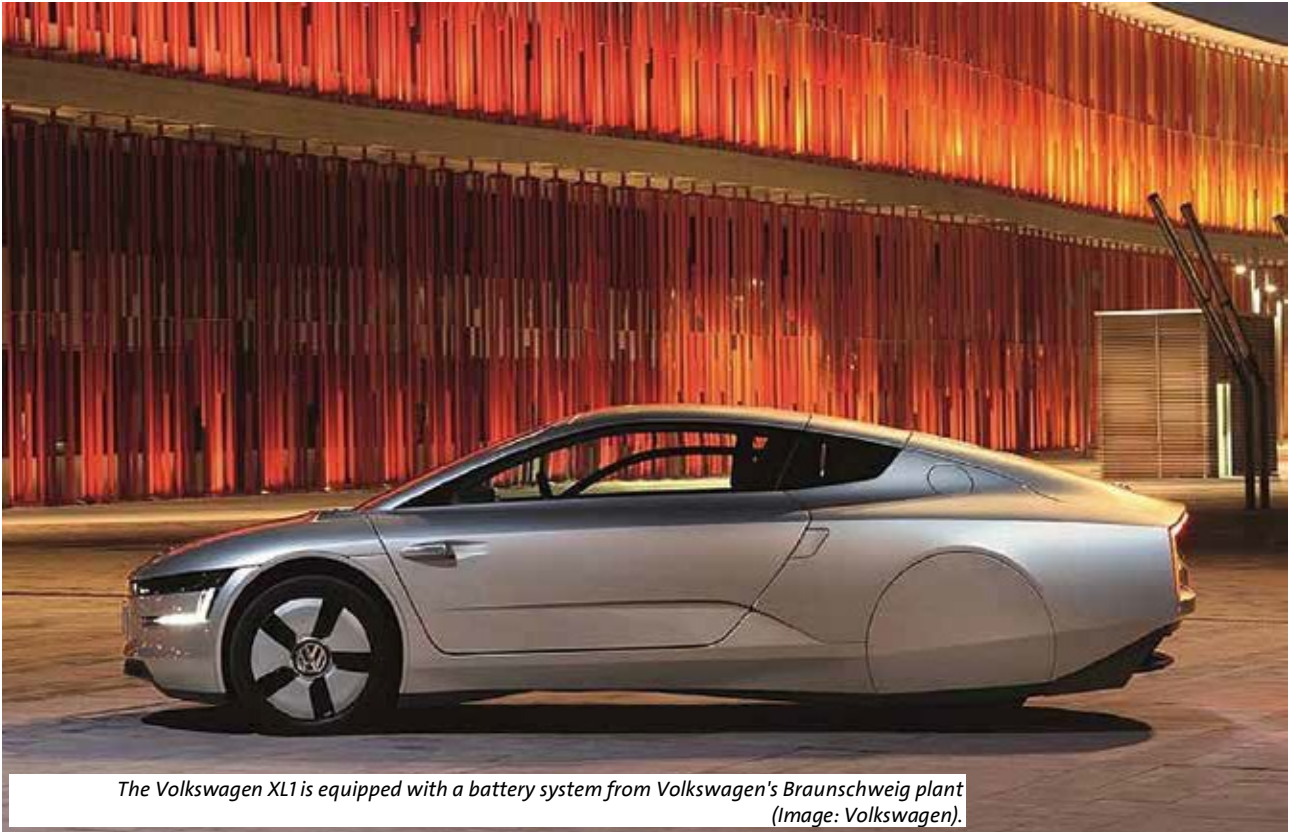


Volkswagen AG Brunswick

Grundfos: Pump Audit at Volkswagen AG in Braunschweig, Germany

Demand-controlled cooling lubricant supply

Pump controller controls external frequency converters: 37 % energy savings



The company

Ecological sustainability is an important corporate goal in the Volkswagen Group worldwide - and it's not just about building ever more efficient cars. Behind the 'Think Blue.Factory' program is the conviction that efficient vehicles should come from efficient production. That is why the Group aims to reduce energy consumption worldwide by 25% by 2018.

The plant in Braunschweig was built as early as 1938, it was the first Volkswagen location ever - at that time still called 'Vorwerk'. Currently, the approximately 8,500 employees in Braunschweig produce chassis parts, rear and front axles, shock absorbers, as well as brakes, brake discs, steering gears and all pedals (today therefore called 'Fahr-Werk'). In addition, there is machine and tool construction as well as plastic parts production. The production spectrum ranges from development to final assembly. A product from Braunschweig is installed in almost every vehicle produced by the Group.

The initial situation

Pump Audit as a pilot project

Whether it's electricity to operate plant and machinery or natural gas for space heating and technical heating, the company aims to exploit potential savings and use efficient technologies for all types of consumption.

In 2011, the energy officer Paul-Gerhard Römermann started a pilot project together with Grundfos to record the current status of the energy consumption of pumps ('Pump Audit'). Specifically, this involved three supply pumps for the cooling lubricant supply (KSS) of metal-cutting machine tools in the swivel bearing area (there are a total of six such cooling lubricant supply systems in this production area). Previously, the pumps were operated in cascade: At least one pump was always working; the second or even the third pump was switched on as required, depending on the quantity.

The Grundfos solution

After monitoring the selected cooling lubricant plant and discussing the results, it was clear that the pumps themselves did not offer any significant savings potential, but their control should be optimized.

The challenge for the Grundfos service experts was to implement this optimization as cost-effectively as possible. Finally, an external frequency converter was installed for each pump, controlled by a higher-level pump controller. The result is an autonomously controlled system, the old control cabinet did not have to be rebuilt (practitioners know: such a rebuild really costs money!).



These three MWF pumps were the focus of attention during the Pump Audit pilot project - due to their cost-effectiveness, they will remain in operation.

Energy saving of 37

A groundbreaking decision, as was soon to become apparent: "Our expectations in 2011 - after monitoring the actual state - namely a saving of 22 %, have become a saving of 37 % after the conversion by Grundfos," reports Römermann.

How can such high savings be explained? Previously, control was via classic contactors that switched the pumps on and off. These power contactors ("stupid click-clack devices," according to Römermann) were replaced by frequency converters ("intelligent, teachable systems because they can be parameterized"). Practice then showed that there is actually not a need for coolant at all times - for example, there are several tool changes throughout the day and the machine tools are at a standstill. "Only the newly installed control technology is able to recognize when the machine tools are

do not require any cooling lubricant and therefore the pumps can be stopped completely," says Römermann.

An MPC pump controller developed by Grundfos is used, which detects pressure changes and controls and coordinates the external CUE frequency converters of the pumps according to the actual demand. As a result, the improved system regulates itself as a stand-alone solution, without regulation by the central control system via bus system and PLC.



"Only the newly installed control technology is capable of recognizing when the machine tools need less or no cooling lubricant and therefore the pumps can be stopped completely" (Paul-Gerhard Römermann, Energy Officer at Volkswagen AG's Braunschweig plant).

What is initially surprising about this pilot project is that it does not involve pumps from Grundfos. Why was this company commissioned with the pump audit?

"Because we had confidence in Grundfos to carry out this pilot project in a solid and open-ended way," says Paul-Gerhard Römermann. Among other things, this is due to the fact that Grundfos has a decidedly different approach than other suppliers and focuses its priority on the real collection of data relevant to Volkswagen: "Only with this data can I work meaningfully and represent our most important goal: a safe process!"

Conclusion: The project at Volkswagen Braunschweig impressively demonstrates that it is not only pumps that offer energy-saving potential, but also their control. Grundfos calls the holistic system approach for pump systems 'iSolutions'. Based on the extremely positive experience with Grundfos, the decision was made at the Braunschweig plant to also convert other systems; five more KSS systems will be equipped with the Grundfos solution before the end of 2014.