

Making manufacturing processes energy efficient

aluminium processing firms:

Technologist: "At last, I now see how much energy is used by the various machine settings, which allows me to make the manufacturing process more efficient and to ensure and monitor compliance with requirements on the part of the machine operators."

Technologist: "The automated outlier analysis provides an excellent overview of manufacturing issues and maintenance work that needs to be taken care of, such as replacing or repairing a frequency converter."

Controller: "I can now produce monthly reports at the touch of a button. The figures are valid and I now have more time and opportunity than ever to address and analyse energy correlations. We have already achieved a great deal, but we know that there is still considerable potential to be exploited in our processes."

Works manager: "Having a transparent overview of the factors influencing our energy consumption allows us to more effectively manage our manufacturing processes and helps us make decisions about further investments."

EPVI is a software solution that can analyze the potential for optimizing production processes. The program is the fruit of cooperation between a regional company and the Leipzig Fraunhofer Center.

Together with Fraunhofer Center Leipzig researchers, you developed EPVI, an energy process optimisation technology for the manufacturing industry. What has come out of this three-year work partnership?

Bergmann: With EPVI, we have produced a software solution that combines energy and manufacturing data to identify potential for saving energy during the manufacturing process. This technology is of tremendous interest to our clients. The project with the Fraunhofer Center has allowed us to flesh out our idea, record and analyze customer requirements, and design evaluation tools. With EPVI, we are offering industrial enterprises a program that they can use to make their manufacturing processes energy efficient and more cost-effective.

What is so innovative about this technology and what energy savings does it deliver for the manufacturing industry?

Maicher: EPVI is co-creation in practice - together with ccc, we have taken the idea from the conceptual stage and turned it into a technology used by the industry. It all started with ccc's vision to determine how much electricity, gas, compressed air and heat are used at each stage and in each batch during the manufacturing process. For example, a plant operator can use EPVI at any time to view the resource needs for the part currently on the machine and even take immediate action in the event of excessive energy consumption to enable savings of four to five per cent. This is what we refer to as the intelligent-energy factory.

What role does EPVI play in the German Government's plans for Industry 4.0?

Maicher: Industry 4.0 is primarily about the digitisation of manufacturing processes. EPVI already allows manufacturing firms to use hundreds of resource meters a second to manage energy efficiency in industrial works. EPVI is big data. This technology does not yet steer manufacturing processes on its own; rather, it helps technologies to operate on an energy-efficient basis. But I can also see manufacturing processes being managed on an automated basis in future.



Contact:
Prof. Dr. Thomas Bruckner

Head of Division Sustainability
Management and Infrastructure
Economics

Head of Unit Stakeholder Dialogue
and Social Acceptance

thomas.bruckner@moez.fraunhofer.de
+49 341 231039-210



Contact:
Prof. Dr. Lutz Maicher

Head of Unit Competitive Intelligence

Junior Professor Technology Transfer
at Friedrich-Schiller-Universität Jena

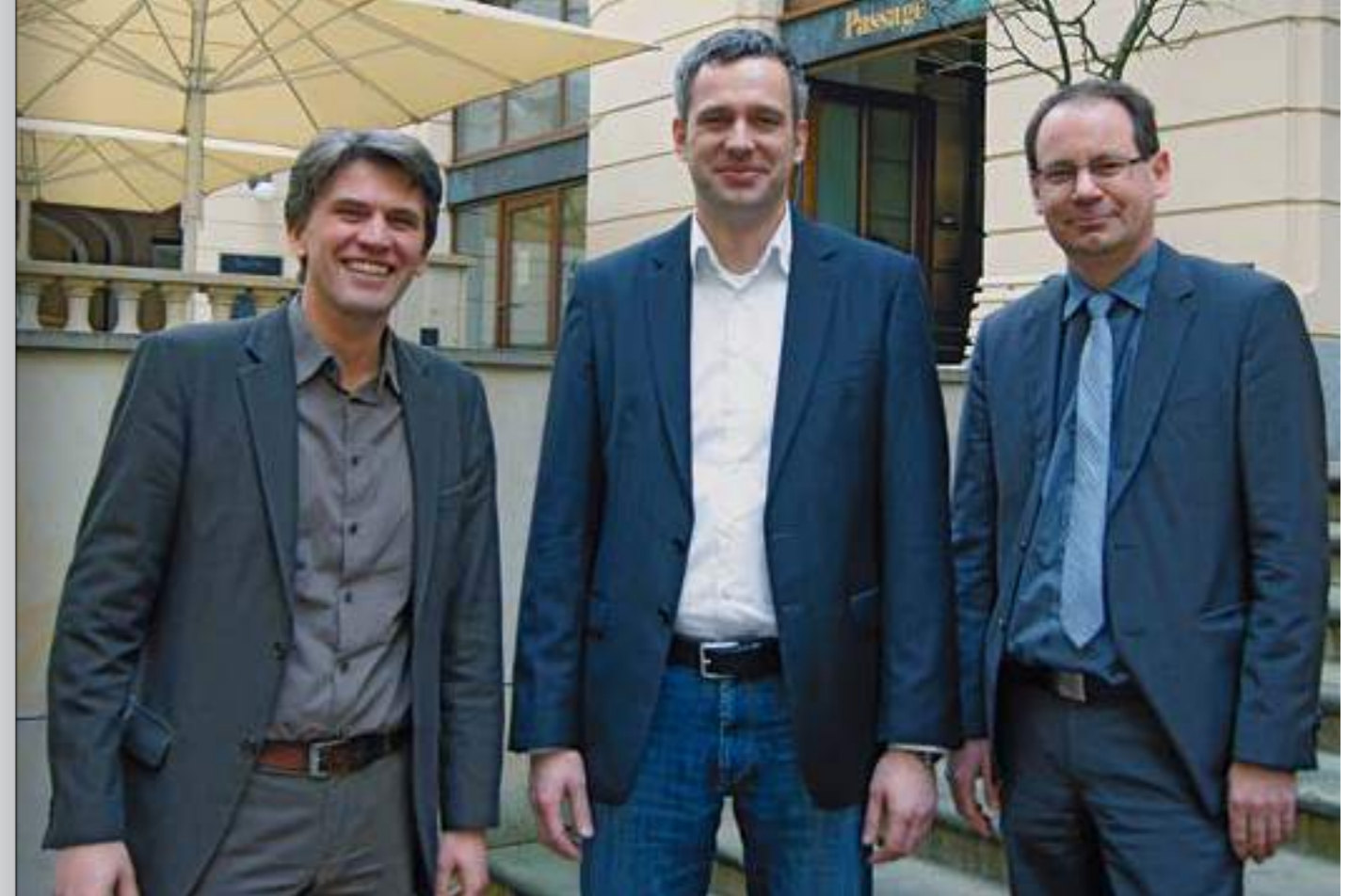
lutz.maicher@moez.fraunhofer.de
+49 341 231039-127

Testimonials from circuit board manufacturers:

Quality management officer: "Having transparent information about energy use is a key prerequisite for introducing ISO 50001. We also require a good concept and a software program tailored to our needs. We have found both of these and are fully prepared for the next few years. Following monitoring, we are concentrating on analysis. A high degree of transparency is needed to allow conclusions to be drawn about causes and potential."

Technician from a media service: "The process of managing energy data always entails many changes and adjustments. I am now able to implement new measurement points very quickly and, most importantly, measure the bulk of energy consumption with virtual meters."

Technical manager: "Combining energy, manufacturing and order data is the only way to draw conclusions about how to improve the energy-efficiency of manufacturing processes. In this way, we are able to improve and optimize our processes on an ongoing basis, which saves on costs. The key thing is to put energy-efficient measures into practice in all departments throughout the company. This software helps us do so, as it allows all employees to work with the system, be they works managers, controllers or technicians."



JProf. Dr. Lutz Maicher, Sven Bergmann and Prof. Dr. Thomas Bruckner (ltr.).

...so the possibilities of EPVI have not yet been exhausted?

Bruckner: By no means. There are many different ways of distributing the load, that is, actual energy consumption, more effectively in the manufacturing industry. So far, this potential has been exploited primarily to reduce peak loads. In future, there will also be a focus on using demand-response measures as regular buffers to improve the use of renewable energies.

How much interest is there in EPVI on the German and international markets?

Bergmann: The level of interest among enterprises is very high as a result of economic pressure and due to the legislative requirements of Germany's Renewable Energy Act (EGG). In setting the energy saving targets, Germany is leading the way on this issue internationally.

Bruckner: Efficient data management allows flexibility potential to be pooled and sold on the balancing energy markets. EPVI allows enterprises to tap this potential for their manufacturing processes and to save on valuable resources.

How is cooperation between ccc software and the Fraunhofer Center Leipzig being continued?

Bergmann: There is additional potential to be leveraged by promoting the circulation of information between energy producers, network operators and consumers. We intend to work with the Fraunhofer Center Leipzig to address these forward-looking topics and develop technologies for the future.



Sven Bergmann, Division Manager Industriesoftware, ccc software gmbh: "We offer industry ventures and corporations a design solution to make finishing processes energy efficient."

