

Preface

The German Energiewende describes the transition to an environmentally friendly, reliable and affordable energy supply system in Germany. It was reinforced by the signature of the Paris climate agreement in 2015. The Energiewende became very relevant for Bavaria, after it was decided to shut down all German nuclear power plants, which once contributed about half the electric energy production in the state. Therefore, according to the Bavarian Energie-3-Sprung, the energy demand shall be reduced, renewable energy generation plants shall be built and the energy efficiency shall be increased. Implementing such efficiency measures can be very profitable for manufacturing companies and potential savings of up to 30 % of the energy costs are feasible. Moreover, customers have become increasingly aware of sustainable products and production.

In order to further increase the energy and material efficiency in manufacturing companies, new technologies and methods have been developed and disseminated within the research project Green Factory Bavaria. The project consortium consists of two Fraunhofer institutes, one in Augsburg and one in Bayreuth, the universities in Erlangen-Nuremberg and Munich, the universities of Applied Sciences Amberg/Weiden, Ansbach, Coburg, Deggendorf, Hof, Ingolstadt, Nuremberg and Schweinfurt/Wuerzburg as well as more than 80 companies. The consortium bundles the research skills of all relevant fields for resource efficient production processes, e.g. mechanical engineering/ manufacturing technology, electrical engineering, information technology, process engineering, materials science and economic science.

Innovative industrial partners and researchers together have analyzed the energy and material efficiency of various fields in factories, ranging from induction motors to logistics and from the energy consumption in illumination to the material consumption in additive manufacturing processes. In more than 35 individual research projects, new insights have been generated which are summarized and published in this journal. These results are also demonstrated at the model factories which have been established at different locations in Bavaria. These model factories serve as a platform for research, demonstration and education purposes. They have enabled an efficient transfer of technologies and methods into the economy and allow hands-on trainings for interested users and students.

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