



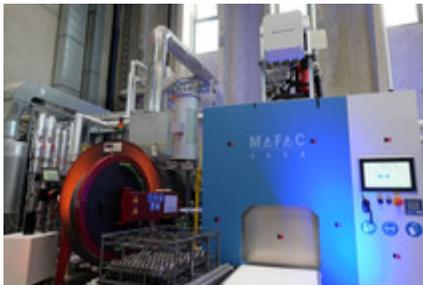
Closing event of the joint “ETA Factory” project on the campus grounds of TU Darmstadt. The factory serves as a research and demonstration facility and as a place of learning.
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Factory as a large-scale research unit

24.04.2018

Multidisciplinary energy efficient production

The closing event of the “ETA Factory” research project took place at TU Darmstadt on 11 April 2018. In the course of the project, a multidisciplinary research group was able to demonstrate the feasibility of energy savings of up to 40 percent in industrial production. The jointly planned research factory saw researchers optimise and network energy flows in production and within the building.



Hardening furnace with surplus gas burner (left) and thermally insulated cleaning machine (right). The heat exchanger module resting on this is used for the recovery of waste heat from drying exhaust air.
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Professor Eberhard Abele, Director of the leading Institute for Production Management, Technology and Machine Tools (PTW) at TU Darmstadt described what made the success possible: “We brought together various scientific areas in the ETA Factory project. With our team from the areas of mechanical engineering, architecture, civil engineering and IT, we were able to develop and verifiably demonstrate new opportunities around energy savings. In the course of the project, we’ve advanced several developments to industrial production.”



View of the production hall at the ETA Factory. Machine equipment forms a process chain typical of the metal processing industry.
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Factory as a place of teaching and learning

Much of the knowledge acquired through the ETA Factory has already been passed on by the Technical University: Some 2,000 visitors from industry visit the factory each year and attend workshops on energy efficiency in production.



The kinetic energy storage device with innovative external rotor design serves to smoothen the electrical load profile and makes it possible to reduce the connected load of the

The “ETA project” now comes to a ceremonial end after five years of research and two years of operation. Energy research at TU Darmstadt, however, is set to continue in various follow-on projects. Continued operation of the model factory offers a framework for pioneering efforts around energy efficiency and energy flexibility. The “PHI Factory” for instance, residing within the ETA Factory, is researching how industrial companies can support the power grid as energy-flexible, active regulatory elements and save energy costs. The “ETA transfer” project will show how principles developed in the ETA Factory are applicable in industry with

it possible to reduce the connected load of the factory. It stores electrical energy in the mechanical rotational movement of the flywheel.

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View of the south side of the building: The large window area of the ETA Factory equipped with light control elements allows for the optimal use of daylight in the hall. The external high-temperature vacuum storage unit is to the right of the building.

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managed by the Institute for Production Management, Technology and Machine Tools (PTW) at TU Darmstadt.

The project kicked off in May 2013, and by March 2016 the ETA Factory commenced operation as a “large-scale research unit” at TU Darmstadt’s Campus Lichtwiese. The aim was to achieve energy savings by interconnecting the innovative building envelope with a production process chain typical of a mechanical engineering facility on a scale considerably beyond that feasible through the energy-based optimisation of individual components.

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salable technologies.

Dr Frank Heidrich of the German Federal Ministry for Economic Affairs and Energy remarks: “The holistic perspective of the ETA Factory project in terms of buildings, machines and processes has seen us create a new aspect in research funding. The positive project outcomes attest to the opportunities on offer through such ideas. Now it comes down to carrying this over into the full body of practical application too. The German Federal Ministry for Economic Affairs and Energy will support this process through the coordinated “Energy Efficiency in Industry and Trade” research network and through further research and transfer projects.”

Multidisciplinary work for more efficient energy use

Alongside researchers from TU Darmstadt in the fields of mechanical engineering, civil engineering and architecture, project participants also included more than 30 partner companies from industry. The project was