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Developing more flexible turbomachines

Compensating for the fluctuating electricity generated by renewable energies

Electricity in Germany is increasingly being provided by renewable energies. In future, conventional power plants will be tasked with covering the remaining needs and compensating for the fluctuating generation of solar and wind power. To achieve this, gas and steam turbines must become more flexible. The BINE-Projektinfo brochure entitled “Flexible turbomachines stabilise the power grid” (07/2017) presents the ECOFLEX-turbo research programme. The research and development targets within this programme, which represents the combined turbine research in Germany under the auspices of the AG Turbo alliance, are aimed at increasing the partial load operation, faster response times, varying fuels and the utilisation of more hydrogen.

Until now, turbines have been designed to run as smoothly as possible under full load conditions in order to achieve good values in terms of efficiency, emissions and longevity. However, increasing the partial load operation now represents a new challenge for turbine technology. Turbines with greater flexibility will require, for example, more robust compressors and combustion chambers as well as new computer software in order to design components and analyse test results. This data will form the basis for powerful simulation models and help to shorten development times in future. A further aim is to design turbines not only for fuel gas with a higher hydrogen content but, if possible, turbines that only utilise hydrogen. Such a power unit would provide a key component for power-to-X concepts.

AG Turbo is an alliance of leading German turbine manufacturers and more than 20 scientific institutions that account for more than two thirds of the subsidised projects in turbine research. Approximately 30% of the globally traded turbomachines come from manufacturers in Germany.

The BINE-Projektinfo brochure, which can be obtained free of charge from the BINE Information Service at FIZ Karlsruhe, is available online at www.bine.info or by calling +49 (0)228-2379-0. The brochure cover and additional image material are also available for download on this web portal in the press section.

Contact
Uwe Milles
presse@bine.info

BINE information service
Kaiserstraße 185-197
53113 Bonn
www.bine.info