

# Millwheel still turning but more quietly

**A**t the base of Paderborn Cathedral there are more than 200 springs which are the origin of the Pader. With a length of 4.4 kilometres the Pader is Germany's shortest river. There the largest overshot water wheel in East Westphalia-Lippe generates electricity. It is called the "Stümpelsche Mühle" and was erected in 1810.

From time to time the river drove fifteen mills, but today only two generate energy. Intended originally as a grain mill, its operation was suspended in the 1970s, and finally the building stood empty in its inner city location for more than 16 years. The Paderborn-based "BioHouse Foundation for the Environment and Justice" invested around 1.5 million euros in this historic complex. The Foundation lays great store by showing off its activities more effectively on a local and regional level. With this in mind it operates a centre in the "Stümpelsche Mühle" for refugees, disabled persons, single parents, people with little education and members of other disadvantaged groups of the population.

"Our overall concept also includes of course the regenerative use of energy from hydropower," says Willi Ernst, Founder of the Biohouse Foundation. As part of the reconstruction work the water resources and monuments authorities were consulted on the reactivation of the technical monument and on raising the efficiency. The appearance and character of the water wheel were restored to their 1956 status. But the water wheel did not run for long: In December 2014 the District Environment Agency arranged for the operation to be suspended because neighbouring residents complained about the wheel's pulsating noise. It became necessary to shut it down at nights

and provide it with a soundproof encasement. The number of paddlewheels was also increased from 24 to 36 to improve the flow.

This was followed up with the development of an innovative solution worthy of the technical monument. This was a joint effort together with the Hydraulic Engineering and Water Resources Faculty of the University of Kassel. The Kassel hydraulic engineer Dr. Reinhard Hassinger researched the effect on the noise development of bristle elements in the paddles of the water wheel. These ensure an even rushing sound and even result in a slightly enhanced performance.

This measure not only exhibited substantial success in the trial operation, but also in a sound examination conducted by the independent expert Dipl.-Phys. Klaus Brokopf from the Bielefeld firm of AKUS. The electricity from the hydropower is intended for use by the Foundation Centre and the planned café and will drive a heat pump.

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Willi Ernst (left on the photo) was fed up with complaints about the water wheel. That's why it was fitted with bristle elements in the paddles.

