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RENEWAT

Interregional learning

Study Visits in Haute-Vienne, France

Saint Leonard de Noblat
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RENEWABLE ENERGY IN EUROPEAN WATERMILLS

The Beaufort Mill

Within an old 19th-century building on the banks of the Vienne River sits Beaufort Mill, a hydropower station owned and operated by the town council of Saint-Leonard-de-Noblat that dates back 125 years.

Saint-Leonard-de-Noblat is situated to the east of Limoges in the department of the Haute-Vienne and the municipal hydropower station houses three turbines, one dating back to 1910, no longer in service. The two operational turbines date from 1946 and 1961.



1. THE RENEWAT PARTNERS IN FRONT OF BEAUFORT MILL

2. THE WEIR AT BEAUFORT



The owners have aimed to ensure its environmental as well as its energy sustainability, with the ecological continuity tackled by the fish pass and sensors in place that are used to monitor the available water resources without impacting the ecological flow downstream according to the governmental regulations. In 2023 the town council agreed to renovate the mill with the objective of doubling the production from the hydropower station.

The planned renovations of new turbine will only improve the hydropower generation without impacting the downstream flow. Currently the power plant is managed by one individual within the municipality and the mill sells its electricity produced under a contract type 'H07' at a fixed price. These contracts are regulated under national energy law. The management of the site is based on the flow available, so when the flow rate increases then the turbine raises its production, and vice versa, similar to most of the small hydropower plant.

For small hydropower plants, the authorizations given do not allow them to control water level variations. In 2021, the power station's turbines produced 743 MWh. The production represents around 10% of the needs of the 1,500 subscribers to the energy company.

Since 2017, the company has had to adopt the status of a local industrial and commercial public service to avoid being subject to the opening of the hydroelectricity market to competition. There are around fifty hydroelectric power stations in the Haute-Vienne. Within the department, the state is experimenting with support for owners, whether private individuals or local authorities.



KAPLAN TURBINE INSTALLED IN 1946



A three-year study, due to finish at the end of 2024 has set out to quantify the potential and provide support to mill owners to undertake the initial feasibility study for hydropower potential.

The work undertaken has described the mill sites, including the buildings, the equipment within the building, the weir, along with estimating the head between upstream and downstream of their equipment. This is followed by a feasibility study to install and improve the equipment. This pilot within the department of the Haute-Vienne has been led by the state agency at the departmental level (DDT).



FRANCIS TURBINE INSTALLED IN 1961



1910 TURBINE WITH WOODEN TEETH:

it is no longer in service but could still work, with low maintenance.

The GOT Mill



Just on the outskirts of Saint-Leonard-de-Noblat, sits an ancient papermill from the 15th Century that is now been renovated into a museum. It still produces its own paper and has an associated print shop. The renovation of the mill has provided socio-economic sustainability to a once disused site.

Following in the footsteps of their 15th-century predecessors, the papermakers now produce pure cotton, linen, and hemp paper by hand for the fine arts and graphic arts: watercolour, pastel, calligraphy, lithography, engraving and many other uses. Providing jobs for local people, it is now a cultural beacon for the region and preserves a local heritage for the future generations. In conjunction with the local municipality, the objective is to create a sustainable centre that is supported by a team of volunteers, alongside the professional artists and paper makers.



MACERATING THE WOOD TO PRODUCE THE PAPER USING ENERGY FROM THE WATERMILL

While the machinery is not from the 15th century it is still a museum piece from the nineteenth century. This has been renovated and is back in operation to produce large sheets of fibreboard, the thickness of which they adapt to demand. This raw cardboard is used by artists for their creations and by our printing workshop for a variety of jobs such as book covers, business cards, announcements, etc.

Drawing inspiration from historic techniques, the mill's papermakers are also committed to constantly inventing new and original papers. The year 2020 saw the launch of recycled papers in bright or pastel colours, vegetable-based papers such as leeks, asparagus, artichokes, and onions, as well as papers made from a variety of plants including ferns, mint, and sage.

Not forgetting the unmissable crumpled papers known as "*Papier smock*" and "*Papier Cobe*", made using a unique and original process on the mill's 1872 round-form machine. All these paper ranges are produced for visitors to the mill, as well as artists, engravers, lithographers, watercolourists, calligraphers, pastel lists, lampshade artists, framers.

The mill exploiter is looking how to concile electricity production and the educative and historical aspects that are at heart of the site.



THE WATER WHEEL of GOT MILL:
to be replaced soon by a modern metal wheel.



RENEWAT PARTNERS AT THE GOT MILL