

Run-of-River Hydropower Generation: Modernization and capacity expansion at Iffezheim Barrage, Rhine River



Sustainable Development Goals Addressed



<p>Organization, Institution or Company</p>
<p>Rheinkraftwerk Iffezheim GmbH is co-owned by EnBW Kraftwerk GmbH of Germany and Electricite de France (EDF) of France.</p>
<p>Location of project site, Country</p>
<p>Iffezheim on Rhine River, France and Germany</p>
<p>Brief narrative description of objective/project/activity/initiative</p>
<p>Several run-of-river power plants are located along the upstream section of the Rhine River which also forms the border between France and Germany.</p> <p>The Iffezheim barrier is a French-German multi-purpose cooperation project first started in 1970. It was built as a run-of-river hydro power station, with initially 4 horizontal turbines. Turbines have a diameter of 5.8 meters and run at 100 rpm, with a total water flow of 1,100 m³/second. With a head of 11 meters, Iffezheim is the biggest RoR power plant on the Rhine, and one of the biggest in Europe.</p> <p>The barrier regulates the water flow and contributes to flood protection. The project also facilitates navigation and shipping on the upper Rhine River. The water gate next to the power station is said to be used by about 45,000 boats and ships each year.</p> <p>In 2009, the operators agreed to modernize the facility and expand its capacity by adding an additional high-efficiency turbine, bringing the total capacity of the five turbines to 148 MW. The additional turbine was added to the commercial operation in 2013.</p>
<p>Economic, environmental and climate benefits, challenges, and lessons learned</p>
<p>With its modernization and capacity expansion the Iffezheim RoR hydropower plant generates more than 860 million kWh of electricity per year. Its production is sufficient to supply the electricity needs of about 250,000 households in the region.</p> <p>Run-of-river hydropower generation practically does not withdraw or consume any water, as the water flow is immediately returned to the river. Hydropower generation from river flows does not generate greenhouse gas emission during operations.</p> <p>The Iffezheim barrier facilitates efforts to reintroduce species of migratory fish to the Rhine river. The barrier features Europe’s largest fish ladder which enables the seasonal migration of fish and addresses important environmental concerns. The Iffezheim fish ladder is 300 m in length, comprises more than 40 interconnected water basins of 15 m³ each, and provides for a water flow of 1.2 m³/second. The fish ladder is fitted with a special turbine that</p>

oxygenates the river water, attracting migratory species including trout, salmon and eel. Fish can pass the run-of-river hydropower station in both upstream and downstream directions.

The Iffezheim barrier collects any floating debris from the river water. This protects the turbines and helps to clean the river. However, management of sedimentation and preventing riverine erosion can pose challenges for run-of-river hydropower production.

Additional information: website addresses and contacts

Further technical information can be obtained for EnBW Company website:

https://www.enbw.com/renewable-energy/wasserkraft/#content_zeile_8_4_neubauprojekte

or by writing to presse@enbw.com

Additional information is also available on the webpage of Iffezheim Municipality (only available in French and German):

https://www.iffezheim.de/pb/Home/Wirtschaft_Tourismus/Staustufe+_+Kraftwerk.html



Ship at Iffezheim Watergate unloading rotor of turbine 5, and fishladder (Photos EnBW/Daniel Meyer-Gerber)

<https://www.enbw.com/company/press/download-centre/power-generation/hydroelectric-plants/>



Aerial view of Iffezheim RoR Plant; and Rotor of Turbine 5 (Photos: EnBW/Daniel Meyer-Gerber) from presse@enbw.com