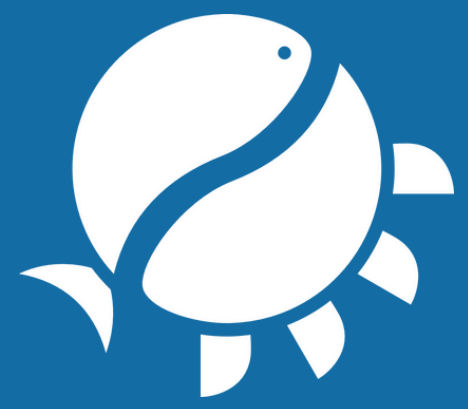


Types of hydropower



#2 infosheet

A hydropower (HP) scheme aims at producing electricity based on a **renewable source**: the water that naturally flows along the rivers. The type of hydropower is dependent on local conditions, mostly, topographic, hydrological, and geological. What is common to all of the projects are the physical changes they introduce in the river ecosystem, namely due to the construction of a dam, weir or diversion, often changing the river regime, obstructing fish and other species' movements, and blocking or reducing the sediment transport.

Hydropower schemes have been also classified into "small" and "large" depending on the installed capacity. **10 MW** is a quite common threshold in many countries, including Portugal. The reservoir created by the dam or weir can be used for other purposes besides electricity production, including irrigation, drinking water supply, flood control, navigation, and recreation.

There are three types of HP schemes commonly accepted: **run-of-river**, **storage** and **pumped-storage** hydropower.

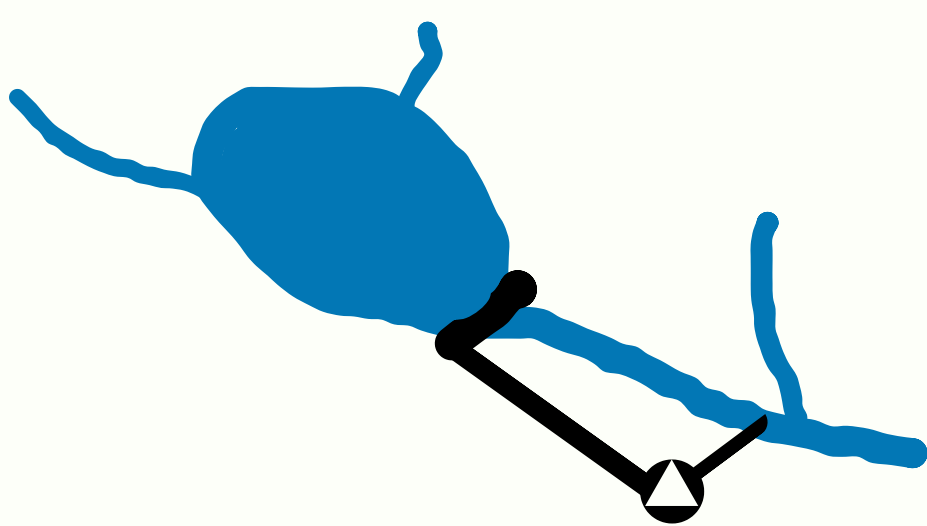
A **storage** HP scheme uses a natural or artificial reservoir that stores part of the river inflows making them available during water shortness periods or peak demands. It can provide weekly, seasonal, or yearly flow regulation. Reservoir-based hydropower provides flexible electricity production. A **run-of-river** HP scheme does not have water storage capacity, i.e., electricity is produced only when there are available river discharges. A **pumped-storage** HP scheme has the possibility to use the low-hour periods and the periods with excessive electricity production, to pump water back to an upstream reservoir, for later use. The coupled upstream and downstream reservoirs act as a battery for the power system.

Storage

Run-of-river

Pumped storage

Diversion



A run-of-river HP scheme is said of **diversion** type when the powerhouse is located in a river bank further downstream from the water intake. In this case, a **bypass** to the river is created to convey part of the river flows to the powerhouse, considerable affecting the ecosystem along partially bypassed river reach.

EcoPeak4Fish case-studies

The case-studies selected for the EcoPeak4Fish project are diversion type, with a bypass section. **Bragado HP scheme** has a reservoir of 34000 m³ and an installed capacity of 3.1 MW. **Covas do Barroso HP scheme** has two small reservoirs of 31000 m³ and an installed capacity of 6.4 MW.



Bragado reservoir



Couto reservoir

Funding

FCT Fundação para a Ciência e a Tecnologia

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