

Project work or Master's thesis
Spring Semester 2021Examiner: Prof. Dr. Robert Boes
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Photovoltaics and Hydropower Reservoirs in Switzerland – Synergies and Potential

Photovoltaics (PV) play a major role in the Swiss Energy Strategy 2050. Compared to a conventional installation in urbanized areas, high-alpine PV may yield a 30% better performance due to stronger solar irradiation and lower panel temperatures. Hydropower reservoirs are often situated at high altitudes and already offer a good accessibility. Therefore, they could provide an ideal base infrastructure for the installation of PV. There are two main options for PV operations at reservoirs: PV panels mounted to the dam structure and floating PV panels on the reservoir (Fig. 1). Since reservoirs are multi-purpose infrastructures, future PV operation should have no negative impacts on other uses, such as hydropower production in particular. In addition, dam safety must not be impaired.



Fig. 1: From left to right: Renderings of PV installed at Muttsee dam, 2474 m a.s.l. (Axpo Power AG), and Albigna dam, 2165 m a.s.l. (EWZ), and photo of floating PV test rig on Lac des Toules, 1810 m a.s.l. (Romande Energie)

Within this Master thesis, the potential for high-alpine PV installations at reservoirs in Switzerland will be assessed. A special focus will be given to PV integration and its effect on special reservoir operation states, e.g. drawdowns and flood discharge. The results of the work may thus contribute to a successful implementation of the Swiss Energy Strategy 2050.

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Report in English or German