

# Danick REYNARD

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**Highest Graduation:** Master Degree in Chemical Engineering and Biotechnology from the Ecole Polytechnique Fédérale de Lausanne, Switzerland (2017)

**Current Position:** PhD Student at EPFL Valais in Sion since 2017

**Research Interest:** Electrochemical energy storage and conversion

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## **Most Important Publication/Presentation:**

[https://www.researchgate.net/profile/Danick\\_Reynard](https://www.researchgate.net/profile/Danick_Reynard)

## **Research Project:**

In the framework of the demonstration site in Martigny, we aim to develop the so-called “dual-circuit redox flow battery”. The system combines electrochemical storage and on-site hydrogen production by including a secondary energy platform, in which electrochemical energy can be converted into hydrogen via mediated water electrolysis. The dual-flow circuit RFB has the advantage to store energy beyond the capacity of the conventional RFB owing to the higher volumetric capacity of the hydrogen energy carrier. Furthermore, mediated water electrolysis has the advantage to enable OER (oxygen evolution reaction) and HER (hydrogen evolution reaction) decoupling in time and in space, unlike conventional technologies). This feature thereby avoids O<sub>2</sub> and H<sub>2</sub> recombination, addressing materials degradation and safety concerns. In addition, the temporal separation of water splitting reactions allows us to design bed reactors using less active and cheaper electrocatalyst, relative to the desired rate of hydrogen production.

More information are available at <https://www.epfl.ch/labs/lepa/swiss-dual-circuit-redox-flow-battery-demonstrator-for-energy-storage-and-hydrogen-production/>

Updates of the project are available at <https://www.researchgate.net/project/Dual-circuit-redox-flow-battery-for-energy-storage-and-conversion>