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Fast e-Fuelling Stations

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Objective: To develop and demonstrate a fuelling station for battery and fuel cell electric vehicles based on a central battery able to store electricity when the cost is low. DC-DC superchargers (CHAdEMO) will be developed to provide fast charging of lithium battery based vehicles. Hydrogen for fuel cell vehicles will be produced on-site, via electrolysis. The e-Fuelling station will be managed by a software to optimise the state-of-charge of the battery, the charging protocol and the hydrogen production.

Electrical Grid



Renewable Resources

Redox Flow Battery: A 200 kW, 400 kWh all-vanadium redox flow battery from Gildemeister Energy Solutions will 'flatten' the energy demand from the fuelling site, while protecting the site from perturbations in the electrical grid. The battery will also serve as the 'brain' of the system, determining when to charge, discharge back into the electrical grid, and produce hydrogen, all while maintaining enough contingency power to supply the site through a blackout.



Electrolysers: Two types of electrolysers, alkaline and proton exchange membrane (PEM), will be evaluated for the production of hydrogen in this demonstrator project. The operating characteristics of these technologies will be considered in the control scheme for the site.



Battery-Electric Charging Station: A charging station with quick (~20 min) DC/DC charging capabilities will be installed on-site.



On-site H₂ Storage: Hydrogen is compressed and stored on-site, ready for fuelling.

H₂ Filling Station: Stored hydrogen will be supplied to vehicles at a suitable pressure for rapid (~5 min) on-demand fuelling.



Battery-Electric Vehicles: Both private and internally-operated battery-electric vehicles will be able to charge at the fuelling station.



Location: The fuelling station demonstrator will be located in Martigny, Canton of Valais, alongside our dual-circuit redox flow battery demonstrator.



Fuel Cell Vehicles: Hydrogen will be supplied to internally-operated fuel cell vehicles, as well as individual external consumers.

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