

Electricity storage in the Blue Battery

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Together with the increasing use of renewable energy source, such as wind and solar, the need for electricity storage is rapidly growing. The existing electrical energy storage (thus far mainly in pumped hydro-energy storage and compressed air) should be expanded in storage capacity by approximately a 100-fold (for daily storage) or 1000-fold (for seasonal storage) (Sinn, 2017). The existing technologies, (pumped hydro-energy storage, compressed air), and neither existing battery technologies (e.g., Li-ion), do not have the capacity and/or materials to cover this demand. Hence, a new electricity storage technology with minimum cost and minimum materials is required.

The Blue Battery aims to cover that need for electrical energy storage. The Blue Battery makes use of the concentration gradient in water, and therefore needs only water and salt as storage medium. When electricity is in excess, the battery can be charged via separating salt and fresh water using ion exchange membranes, that can concentrate the salt water using electricity. The salt and fresh water are stored in closed reservoirs. When electricity is needed, the salt and fresh water can be mixed with the same membrane stacks, where electricity is then generated. The Blue Battery is developed by AquaBattery, in collaboration with grid companies, industrial partners and research institutes,

In this parallel sessions, we will explain the technology concept, demonstrate the operation and let you think about the consequences of using electricity storage on the (local) electricity transport.

Presenters:

- Juan Sebastian Alvarez (AquaBattery)
- Elisabeth Vandeventer (Zown / EXE Energy)
- Samira Farahani (TU Delft)

